**Inter-Office Memorandum**

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| To | dragon interest | Date | May 12, 1981 |
| From | Gene McDaniel | Location | Palo Alto |
| Subject | Collecting and Analyzing Pair Frequency Data for Mesa Opcodes | Organization | csl |

ROX

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## 1. Introduction

This memo describes available facilities that provide for the collection and analysis of dynamic opcode pair-frequency information for Mesa programs. By dynamic we refer to the execution time occurrence of instructions rather than the static or compile time occurence of instructions. By pair-frequency we refer to the frequency with which one instruction or class of instructions is followed by another specific instruction or class of instructions.

This memo assumes the reader is familiar with the details of Mesa, the Mesa instruction set and the Princ Ops architecture in general. The tools described herein provide information that will be of interest mostly to hardware and instruction set designers. Ideally these facilities will help investigators gain insights as to what combinations of instructions frequently occur and as to what dependencies among instructions may cause performance penalties in a pipeline. Information of this sort is limited because it describes what *is* rather than what *could be*. There are analysis facilities that the author hopes will partially mitigate this situation.

These facilities are easy to use: There is a data collection phase and a data analysis phase, each of which has convenient defaults. There are such files of data from specific experiments and standard analyses that some investigators may not choose to run other experiments or to use the interactive data analysis facilities. Those who wish to gather data about other programs will find it fairly simple to do. In simple cases it is not necessary to modify the target program (the program for which pariwise instruction data is gathered). The analysis program provides a standard analysis that the investigator can apply directly to the data by invoking a program from the executive. There are additional facilities within the analysis program that enable the investigator to construct *inquires* about the data. By this means the investigator can determine how often arbitrary collections of instructions were followed by other, arbitrary collections of instructions.

There are important restrictions associated with this facility. It runs only on a 1M-word Dorado. It does not work for pilot programs, programs that require the color display, garbage collection or any other special microcode.

The remainder of this memo comes in five parts. The section below provides a simple scenario whereby the investigator can analyze the dynamic pair frequencies associated with a program. The next section discusses the mechanism whereby the special microcode collects the data. Following that there are two sections that discuss the standard data analysis and interactive queries respectively. The appendix details specific features in the standard analysis of data and documents the program interface.

**Where to find the Files.** All files are located in [ivy]<doradosource> or <dorado>. There is a command file, setUpForPairs.cm on [ivy]<doradosource> that will fetch all the program modules the investigator will need. The author conducted two experiments whose results may be found on ivy:

[ivy]<doradosource>pairs>compiler.press, compiler.counts
[ivy]<doradosource>pairs>static.press, static.counts

The .press files are the standard output produced by the PairFreq program, and the .counts files contain the raw data for experiments. The "compiler" files are the analysis and data files associated with a run of the mesa compiler. Pair-counting was turned off while disk IO was performed. The static files are the analysis and data files associated with a run of the "static" program written by Baskett. Pair-counting was turned-off when disk IO was likely to be performed, however, some disk IO probably was measured. Static makes use of the extra memory available on a D* machine and performs a lot of floating point arithmetic.

Section 5 describes the interactive commands of PairFreq. The reader can use them to read one of the .counts files with PairFreq and then to perform further analysis.

## 2. A Simple Scenario

Suppose you have a program for which you wish to collect dynamic pair frequency information. Proceed with the following steps:

1. Find a 1 M-word Dorado.
2. Move your program to that Dorado
3. Fetch [ivy]<doradosource>setUpForPairs.cm
4. Type "@setUpForPairs.cm"(carriage return)
5. Run you program
6. Type "StopMicroPcPairs (carriage return)"
7. Type "PairFreq (carriage return)"
8. Print Mesa.typescript to see the standard analysis.

## 3. About Data Collection

The author modified the Mesa microcode to provide for gathering instruction pair data. There is a "miscellaneous" instruction whose parameter is a LONG POINTER to an array of 2↑16 LONG CARDINALS! This array is named "pairData". When the pointer is 0, the microcode does not collect pair frequency data. The microcode entry point for most instructions has been modified so that it contains a subroutine call to the pair frequency collector. The pair frequency collector increments the LONG CARDINAL whose index is indicated by the concatenation of the last opcode with the current opcode. To provide a better gauge for true PRINC OPS and Dragon behavior, the microcode ignores no-op instructions. The effect is as if the sequence <instr1><no-op><instr2> were really <instr1><instr2>. This has been done because the Alto/Mesa implementation has an unnatural number of no-ops. An instruction that has not been instrumented will be counted as if it were instruction 377B.

Ease of microcode implementation requires pairData to be an array of double precision values; ie., it is a contiguous region of 2↑17 words or two "banks" of memory. Unfortunately, the Alto/Mesa system insists upon claiming and writing into the first page of each bank of memory. Consequently, the setUpForPairs.cm file sets mesabanks so that Mesa will not try to write in the first page of each of the banks used by the microcode.

Investigators must be careful to avoid collecting data that is biased in some arbitrary, uninteresting fashion. For example, the Mesa disk driver does a busy wait to see if a disk command is finished. Programs that do very much disk IO will show a very heavy bias towards the small collection of instructions in the disk driver's busy wait loop. The easiest way to deal with this problem is to turn off the pairs collection before waiting on the disk. Of course that requires modifying the Mesa disk IO driver. Such a version of Mesa (actually a pre-release version of Mesa 6) is available; however, progress will be simpler if the investigator can "bracket" procedures that do IO with a call on the procedures that turn off and on pair collecting. The program interface provided by these facilities is described in greater detail below in the appendix, A.2.

## 4. *PairFreq:* Standard Analysis

In this section we discuss the format and content of the standard analysis provided by the PairFreq program. In its default mode of operation PairFreq *assumes* that pairData is available in the region of memory beyond that normally accessed by Mesa programs. This assumption is *important.* PairFreq's default mode of operation will not work unless the investigator has recently run an experiment that left pairData properly initialized. The *Simple Scenario* above describes how to accomplish this.

When PairFreq begins to execute it checks to see if the space bar is depressed. If the space bar is "up", PairFreq proceeds with the standard analysis that is the principal topic of this section.

### 4.1 Partitioning the Mesa Instruction Set

PairFreq has built into it several different ways of viewing the Mesa instruction set. These "ways of viewing" are called partitions and much of the analysis is concerned with describing mesa instructions and instruction pairs in terms of the partitions. There are four built-in partitions: "Princ Ops", "Locals vs. Globals", "Loads vs. Stores", and "Alu Inputs for Memory Ops". The "G" command to PairFreq will generate a list of the partitions and their contents.

The Princ Ops partition breaks the Mesa instruction set into a collection of subgroups that correspond to typical ideas about what sort of group each instruction belongs to. The Locals vs. Globals group divides the instruction set into instructions that principally reference the Local or Global frames (or "other"). Loads vs. Stores divides the instructions into those whose main function is to read memory vs those that write memory (or "other"). The "Alu Inputs for Memory Ops" group partitions instructions based upon how many operands are required in the computation associated with the first memory references (or "other"). For example, its aiMem2 subgroup consists of the instructions that require two operands -- like LL2 (L+2) or SGB (G+alpha) -- while aiMem3 is the group that requires three operands -- like R3 (MDS+Top of Stack + 3).

The appendix of this document details each partition, its contents and the idea behind each partition and its subgroups.

### 4.2 Single Instruction Frequencies by Opcode

Following the preamble that shows the default partitions used by PairFreq the standard analysis provides a section that shows single instance instruction frequencies. The instructions are sorted by opcode value. Typical output is shown below; the number in parenthesis is the opcode value in octal, the whole number is the count associated with the instruction, and the fraction is the *per cent* of all instructions that instruction represents:

```
Instruction Frequencies by Opcode
NO-OP       ( 0)        0           0
ME          ( 1)        19138       0.015338275
MRE         ( 2)        26990       0.02163131
                ...
LL0         ( 10)       6429428     5.152907
                ...
```

### 4.3 Statistics Within Partitions

The standard analysis provides an identical style analysis for all four standard partitions. This phase of the analysis generates about 20 pages of output! Within the analysis for each partition, the first section that appears is a sorted list of the rankings for each subgroup, followed by a sorted list of instructions within each group:

*Instruction Frequencies by Group: PRINC OPS*

```
Ld/Store    230441422   32.96895    32.96895
R/W         1369992722  19.599365   52.568314
...
Processes   85766       0.012270428 99.99998
```

Notice that the first numeric column is a count of the number of occurrences for that group followed by the per cent of the partition that group represents followed by a cumulative percent. The individual frequencies within the subgroups follows the same format:

*In 'Princ Ops', Opcode frequencies for 'Ld/Store' (32.96895)*

```
OPCODE      COUNT       PERCENT     CUM         SYS         SYS
                                    PERCENT     PERCENT     CUM
LL0         574438      40.638054   40.638054   0.11345198  0.11345198
LG0         139315      9.855703    50.49376    0.027514827 0.1409668
...
LGDB        8           5.659521e-04 99.99998   1.580006e-06 0.2791767
```

### 4.4 Pair Statistics by Group

This phase of the analysis provides pairwise statistics by group rather than by individual opcode pairs. Once again, this analysis is provided for all four partitions (about 5 pages of output). The information is a sorted list of group pairs along with the count of how many times the pair occurred, the pair's percentage and the cumulative percentage:

*Pair Statistics by Group: PRINC OPS*

| | | | | |
|---|---|---|---|---|
| <R/W, | CondJumps> | 36272745 | 10.378987 | 10.378987 |
| <Ld/Store, | Ld/Store> | 33956570 | 9.716243 | 20.09523 |
| ... | | | | |
| <Ld/Store, | Processes> | 14 | 4.00592e-06 | 99.99996 |

### 4.5 Opcodes Sorted by Single Occurrence Frequency

This table simply provides all the instructions sorted by frequency of dynamic occurrence:

OPCODES SORTED BY SINGLE OCCURRENCE FREQUENCY

| Opcode | Count | Percent | Cum Percent |
|---|---|---|---|
| JZNEB | 71953182 | 10.294248 | 10.294248 |
| LL0 | 62626685 | 8.959917 | 19.254166 |
| ... | | | |
| LP | 4 | 5.7227e-07 | 100.000046 |

### 4.6 Opcodes Sorted by Pairwise Frequency

This analysis provides single instruction pairs sorted by frequency of occurrence. Since there are so many pairs and their importance diminishes rapidly, the analysis stops printing when the individual pair contribution is <.05%:

*Pairwise Frequencies*

| | | | |
|---|---|---|---|
| <RF,JZNEB> | 17071726 | 2.4424923 | 2.4424923 |
| <JZNEB,LL0> | 16964390 | 2.4270728 | 4.8695025 |
| ... | | | |
| <ADD01,R0> | 354332 | 0.050693817 | 30.033615 |

## 5. *PairFreq:* Interactive Analysis

The PairFreq program allows investigators to make queries regarding the contents of pairData and to manipulate the contents of pairData. Under normal circumstances PairFreq simply performs the standard analysis upon the contents of pairData and returns to the executive. If the investigator depresses the "space bar" on the keyboard while PairFreq starts to run, the program will ask for directions as to what it should do. The program prints the following message:

Regular option:
1) Print current table (Standard analysis).
2) Append current table onto 'paircounts.log'.
3) Zero current table. Type CR or ;Y(y)es for Standard option.

If the user types anything except the carriage return or an upper or lower case Y the program explains the set of available options:

a=Ask questions,
c=input Comment string,
f=useFile name,
g=print opcode Groups,
k=KILL paircounts.log,
o=Old data(read it, process it and then zero table)
p=Process table (standard analysis),
q=QUIT
r=regular option,
s=save it,
z=Zero current table

The next character the user types will decide which option PairFreq exercises. The major distinction is between asking questions about pairData and manipulating the contents of pairData. Each option is described below.

### 5.1 Asking questions about pairData

**Ask questions.** The investigator can cause PairFreq to find and print all pairs that match a specified pattern. The basic format is "pattern1, pattern2" terminated by a carriage return, control-L or control-R. PairFreq takes this command to mean find all the occurrences of pairs where the first element of the pair is in pattern1 and the second element of the pair is in pattern2. The terminating character determines for which side PairFreq prints detailed information. The normal default is to print details concerning the left side of the pattern -- control-L will force this case. When the user terminates the pattern with control-R PairFreq prints information for the current and subsequent patterns with details for the right side.

There are operators to add (+) and remove (-) opcodes from a group as well as an operator to define a range of opcodes (!). The special symbol, *, denotes all instructions. Thus, *-LL2, LL0+LL2 denotes the pair consisting of "all instructions *except* LL2", LL0 *or* LL2.

LL1,LL0 matches *-LL2, LL0+LL2
SFC,LL2 matches *-LL2, LL0+LL2
ADD,LL1 does not *-LL2, LL0+LL2
LL2, LL0 does not *-LL2, LL0+LL2.

Either a number (decimal or octal) or an opcode follows the range operator. In the case of the number the effect is to define a range whose length is the number while the opcode format defines a range whose bound is defined by the opcode.

LL0!5 matches LL0, LL1, LL2, LL3, LL4
LL0!LL4 matches LL0, LL1, LL2, LL3, LL4.

This query facility recognizes *generators*. A generator is any one of the predefined partitions and subgroups already discussed. A period is used to distinguish the beginning of the partition name and the beginning of the subgroup name. The space character is part of a generator's name and must be present for PairFreq to recognize a generator; it does ignore case differences, however.

.Princ Ops.Xfers, LL0 matches any instruction in Xfers followed by LL0
.Princ Ops.Ld/Store - LL0, * matches the pair, "any load/store except LL0" followed by "any instruction".

The query facility prints the number of pairs that match the input and then sorts those pairs according to frequency. The results of applying the range operator to a generator are undefined.

### 5.2 Manipulating the Contents of pairData

**Comment string, use*F*ile name, *S*ave it.** PairFreq has the ability save pairData on a file. The user has the ability to select a file name other than the default name (PairCounts.log), and the ability to insert a comment string (terminated by carriage return) that will be placed in the file. The comment string appears early in the file so it can be seen by the user; PairFreq also prints out the comment string when it reads a file. The Save it command actually causes the file to be written.

**print opcode *G*roups.** This command causes PairFreq to print the four partitions used in the standard analysis.

***O*ld Data.** PairFreq will read the file by the current file name and write its contents into pairData. With this facility investigators can reexamine the results of old experiments, or add data results together.

***P*rocess the data.** PairFreq will perform the standard analysis upon pairData.

***Q*uit.** Return to the executive.

***R*egular option.** Provide the standard option and return to the executive.

***Z*ero the current table.** Zero the contents of PairData.

## 6. Summary

This document describes existing facilites to collect and analyze dynamic instruction pair data for Mesa programs. The two principal limitations associated with these facilities are the reliance upon 1 M-W Dorados and the inability to instrument Pilot or Cedar programs. There are no plans for changing this situation. The principal difficulty is to modify the Pilot Dorado microcode. This is *probably* straightforward, however there may be problems associated with having enough microinstruction memory to instrument all the Mesa instructions.

# APPENDIX

## A.1 Partitions of the Mesa Instruction Set

## PRINC OPS

The Princ Ops partition reflects current ideas about the classes into which the Mesa opcodes fall.

**Ld/Store**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| LL0 | LL1 | LL2 | LL3 | LL4 | LL5 | LL6 | LL7 | LLB | LLDB |
| SL0 | SL1 | SL2 | SL3 | SL4 | SL5 | SL6 | SL7 | SLB | PL0 |
| PL1 | PL2 | PL3 | LG0 | LG1 | LG2 | LG3 | LG4 | LG5 | LG6 |
| LG7 | LGB | LGDB | SG0 | SG1 | SG2 | SG3 | SGB | SLDB | SGDB |

**Ld Immed**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| LI0 | LI1 | LI2 | LI3 | LI4 | LI5 | LI6 | LIN1 | LINI | LIB |
| LIW | LINB | | | | | | | | |

**R/W**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LADRB | | GADRB | | LCO | 75 | 76 | 77 | R0 | R1 | R2 | R3 |
| R4 | RB | W0 | W1 | W2 | WB | RF | WF | RDB | RD0 | | |
| WDB | WD0 | RSTR | WSTR | RXLP | WXLP | RILP | RIGP | WILP | RIL0 | | |
| WS0 | WSB | WSF | WSDB | RFC | RFS | WFS | RBL | WBL | RDBL | | |
| WDBL | RXLPL | WXLPL | | RXGPL | | WXGPL | | RILPL | WILPL | RIGPL | WIGPL |
| RSTRL | WSTRL | | RFL | WFL | RFSL | WFSL | | | | | |

**Stack Ops**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| PUSH | POP | EXCH | LINKB | DUP | NILCK | NILCKL | BNDCK |

**Jumps**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| J2 | J3 | J4 | J5 | J6 | J7 | J8 | J9 | JB | JW |
| JIB | JIW | | | | | | | | |

**CondJumps**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| JEQ2 | JEQ3 | JEQ4 | JEQ5 | JEQ6 | JEQ7 | JEQ8 | JEQ9 | JEQB | JNE2 |
| JNE3 | JNE4 | JNE5 | JNE6 | JNE7 | JNE8 | JNE9 | JNEB | JLB | JGEB |
| JGB | JLEB | JULB | JUGEB | JUGB | JULEB | JZEQB | JZNEB | | |

**ALU Ops**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ADD | SUB | MUL | DBL | DIV | LDIV | NEG | INC | AND | OR |
| XOR | SHIFT | DADD | DSUB | DCOMP | | DUCOMP | | ADD01 | |

**Xfers**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| EFC0 | EFC1 | EFC2 | EFC3 | EFC4 | EFC5 | EFC6 | EFC7 | EFC8 | EFC9 |
| EFC10 | EFC11 | EFC12 | EFC13 | EFC14 | EFC15 | EFCB | LFC1 | LFC2 | LFC3 |
| LFC4 | LFC5 | LFC6 | LFC7 | LFC8 | LFC9 | LFC10 | LFC11 | LFC12 | LFC13 |
| LFC14 | LFC15 | LFC16 | LFCB | SFC | RET | LLKB | PORTO | | PORTI |
| KFCB | | | | | | | | | |

**Misc**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| NO-OP | LP | z174 | z175 | z176 | z177 | z271 | z272 | z273 | z274 | |
| z275 | z276 | z277 | DESCB | DESCBS | | BLT | BLTL | BLTC | BLTCL | ALLOC |
| FREE | IWDC | DWDC | STOP | CATCH | | MISC | BITBLT | | STARTIO | JRAM |
| DST | LST | LSTF | z373 | WR | RR | BRK | z377 | | | |

**Processes**

| | | | | | | |
|---|---|---|---|---|---|---|
| ME | MRE | MXW | MXD | NOTIFY | BCAST | REQUEUE |

## LOCALS VS GLOBALS GROUP

The Locals vs. Globals Group divides the instruction set into roughly three categories: those instructions that reference values relative the Local frame, those that reference values relative the Global frame and all others.

**locals**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| LL0 | LL1 | LL2 | LL3 | LL4 | LL5 | LL6 | LL7 |
| | LLB | LLDB | SL0 | SL1 | | | |
| SL2 | SL3 | SL4 | SL5 | SL6 | SL7 | SLB | PL0 |
| | PL1 | PL2 | PL3 | | | | |
| LADRB | SLDB | | | | | | |

**localsIndir**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RXLP | WXLP | RILP | WILP | RIL0 | RXLPL | WXLPL | |
| RILPL | WILPL | | | | | | |

**globals**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| LG0 | LG1 | LG2 | LG3 | LG4 | LG5 | LG6 | LG7 |
| | LGB | LGDB | SG0 | SG1 | | | |
| SG2 | SG3 | SGB | GADRB | SGDB | | | |

**globalsIndir**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| RIGP | RXGPL | WXGPL | RIGPL | WIGPL | | | |

**addresses**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| LCO | 75 | 76 | 77 | R0 | R1 | R2 | R3 |
| | R4 | RB | W0 | W1 | W2 | WB | RF |
| | WF | RDB | RD0 | | | | |
| WDB | WD0 | RSTR | WSTR | WS0 | WSB | WSF | |
| WSDB | RFC | RFS | WFS | RBL | | | |
| WBL | RDBL | WDBL | RSTRL | WSTRL | RFL | WFL | |
| RFSL | WFSL | LLKB | | | | | |

**xfersInLG**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| EFC0 | EFC1 | EFC2 | EFC3 | EFC4 | EFC5 | EFC6 | |
| EFC7 | EFC8 | EFC9 | EFC10 | EFC11 | | | |
| EFC12 | EFC13 | EFC14 | EFC15 | EFCB | LFC1 | LFC2 | |
| LFC3 | LFC4 | LFC5 | LFC6 | LFC7 | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| LFC8 | LFC9 | LFC10 | LFC11 | LFC12 | LFC13 | LFC14 | |
| LFC15 | LFC16 | LFCB | SFC | RET | | | |
| PORTO | PORTI | KFCB | | | | | |
| **LdImmedInLG** | | | | | | | |
| LI0 | LI1 | LI2 | LI3 | LI4 | LI5 | LI6 | |
| LIN1 | LINI | LIB | LIW | LINB | | | |
| **AluInLG** | | | | | | | |
| ADD | SUB | MUL | DBL | DIV | LDIV | NEG | INC |
| | AND | OR | XOR | SHIFT | | | |
| DADD | DSUB | DCOMP | DUCOMP | ADD01 | | | |
| **CondJumpsInLG** | | | | | | | |
| JEQ2 | JEQ3 | JEQ4 | JEQ5 | JEQ6 | JEQ7 | JEQ8 | |
| JEQ9 | JEQB | JNE2 | JNE3 | JNE4 | | | |
| JNE5 | JNE6 | JNE7 | JNE8 | JNE9 | JNEB | JLB | |
| JGEB | JGB | JLEB | JULB | JUGEB | | | |
| JUGB | JULEB | JZEQB | JZNEB | | | | |
| **JumpsInLG** | | | | | | | |
| J2 | J3 | J4 | J5 | J6 | J7 | J8 | J9 |
| | JB | JW | JIB | JIW | | | |
| **other** | | | | | | | |
| NOOP | ME | MRE | MXW | MXD | NOTIFY | BCAST | |
| REQUEUE | LP | PUSH | POP | | | | |
| EXCH | LINKB | DUP | NILCK | NILCKL | BNDCK | z174 | z175 |
| | z176 | z177 | z271 | | | | |
| z272 | z273 | z274 | z275 | z276 | z277 | DESCB | |
| DESCBS | BLT | BLTL | BLTC | | | | |
| BLTCL | ALLOC | FREE | IWDC | DWDC | STOP | CATCH | |
| MISC | BITBLT | STARTIO | | | | | |
| JRAM | DST | LST | LSTF | z373 | WR | RR | |
| BRK | z377 | | | | | | |

## MEMORY: LOADS VS STORES

The Loads vs. Stores group divides the instruction set into those instructions the load values from memory vs. those that store values into memory. Some instructions may do both and the author made an arbitrary decision about which subgroup subsumes each instruction. For example, while WIGPL both reads and writes memory it is a member of "globalsIndir".

**loads**

| | | | | | | |
|---|---|---|---|---|---|---|
| LL0 | LL1 | LL2 | LL3 | LL4 | LL5 | LL6 |
| LL7 | LLB | LLDB | LG0 | LG1 | LG2 | LG3 |
| LG4 | LG5 | LG6 | LG7 | LGB | LGDB | R0 |
| R1 | R2 | R3 | R4 | RB | RF | RDB |
| RD0 | RSTR | RXLP | RILP | RIGP | RIL0 | RFC |
| RFS | RBL | RDBL | RXLPL | RXGPL | RILPL | RIGPL |
| RSTRL | RFL | RFSL | | | | |

**stores**

| | | | | | | |
|---|---|---|---|---|---|---|
| SL0 | SL1 | SL2 | SL3 | SL4 | SL5 | SL6 |
| SL7 | SLB | PL0 | PL1 | PL2 | PL3 | SG0 |
| SG1 | SG2 | SG3 | SGB | W0 | W1 | W2 |
| WB | WF | WDB | WD0 | WSTR | WXLP | WILP |
| WS0 | WSB | WSF | WSDB | WFS | WBL | WDBL |
| WXLPL | WXGPL | WILPL | WIGPL | WSTRL | WFL | WFSL |
| SLDB | SGDB | | | | | |

**ldstOtherImmed**

| | | | | | | |
|---|---|---|---|---|---|---|
| LI0 | LI1 | LI2 | LI3 | LI4 | LI5 | LI6 |
| LIN1 | LINI | LIB | LIW | LINB | LCO | |

**ldstOtherJumps**

| | | | | | | |
|---|---|---|---|---|---|---|
| J2 | J3 | J4 | J5 | J6 | J7 | J8 |
| J9 | JB | JW | JEQ2 | JEQ3 | JEQ4 | JEQ5 |
| JEQ6 | JEQ7 | JEQ8 | JEQ9 | JEQB | JNE2 | JNE3 |
| JNE4 | JNE5 | JNE6 | JNE7 | JNE8 | JNE9 | JNEB |
| JLB | JGEB | JGB | JLEB | JULB | JUGEB | JUGB |
| JULEB | JZEQB | JZNEB | JIB | JIW | | |

**ldstOtherStackAlu**

| | | | | | | |
|---|---|---|---|---|---|---|
| LP | PUSH | POP | EXCH | DUP | NILCK | NILCKL |
| BNDCK | ADD | SUB | MUL | DBL | DIV | LDIV |
| NEG | INC | AND | OR | XOR | SHIFT | DADD |
| DSUB | DCOMP | DUCOMP | ADD01 | | | |

**ldstOtherXfers**

| | | | | | | |
|---|---|---|---|---|---|---|
| EFC0 | EFC1 | EFC2 | EFC3 | EFC4 | EFC5 | EFC6 |
| EFC7 | EFC8 | EFC9 | EFC10 | EFC11 | EFC12 | EFC13 |
| EFC14 | EFC15 | EFCB | LFC1 | LFC2 | LFC3 | LFC4 |
| LFC5 | LFC6 | LFC7 | LFC8 | LFC9 | LFC10 | LFC11 |
| LFC12 | LFC13 | LFC14 | LFC15 | LFC16 | LFCB | SFC |
| RET | PORTO | PORTI | KFCB | | | |

**ldstOther**

| | | | | | | |
|---|---|---|---|---|---|---|
| NO-OP | ME | MRE | MXW | MXD | NOTIFY | BCAST |
| REQUEUE | LADRB | GADRB | 75 | 76 | 77 | |
| LINKB | z174 | z175 | z176 | z177 | z271 | z272 |
| z273 | z274 | z275 | z276 | z277 | LLKB | DESCB |
| DESCBS | BLT | BLTL | BLTC | BLTCL | ALLOC | FREE |
| IWDC | DWDC | STOP | CATCH | MISC | BITBLT | STARTIO |
| JRAM | DST | LST | LSTF | z373 | WR | RR |
| BRK | z377 | | | | | |

## ALU INPUTS FOR MEMORY ADDRESS

Alu Inputs for Memory Address provides information about how many arithmetic operations must be performed before a memory operation may take place.

**aiJump**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| J2 | J3 | J4 | J5 | J6 | J7 | J8 | J9 |
| JB | JW | | | | | | |

**aiAluCbr**

| | | | | | | |
|---|---|---|---|---|---|---|
| JEQ2 | JEQ3 | JEQ4 | JEQ5 | JEQ6 | JEQ7 | JEQ8 |
| JEQ9 | JEQB | JNE2 | JNE3 | JNE4 | JNE5 | JNE6 |
| JNE7 | JNE8 | JNE9 | JNEB | JLB | JGEB | JGB |
| JLEB | JULB | JUGEB | JUGB | JULEB | JZEQB | JZNEB |

**aiCmplx**

| | | | | | | |
|---|---|---|---|---|---|---|
| ME | MRE | MXW | MXD | NOTIFY | BCAST | REQUEUE |
| 75 | 76 | 77 | z174 | z175 | z176 | z177 |
| JIB | JIW | MUL | DIV | LDIV | z271 | z272 |
| z273 | z274 | z275 | z276 | z277 | EFC0 | EFC1 |
| EFC2 | EFC3 | EFC4 | EFC5 | EFC6 | EFC7 | EFC8 |
| EFC9 | EFC10 | EFC11 | EFC12 | EFC13 | EFC14 | EFC15 |
| EFCB | LFC1 | LFC2 | LFC3 | LFC4 | LFC5 | LFC6 |
| LFC7 | LFC8 | LFC9 | LFC10 | LFC11 | LFC12 | LFC13 |
| LFC14 | LFC15 | LFC16 | LFCB | SFC | RET | PORTO |
| PORTI | KFCB | BLT | BLTL | BLTC | BLTCL | ALLOC |
| FREE | STOP | MISC | BITBLT | STARTIO | JRAM | |
| DST | LST | LSTF | z373 | BRK | z377 | |

**aiMem2**

| | | | | | | |
|---|---|---|---|---|---|---|
| LL0 | LL1 | LL2 | LL3 | LL4 | LL5 | LL6 |
| LL7 | LLB | LLDB | SL0 | SL1 | SL2 | SL3 |
| SL4 | SL5 | SL6 | SL7 | SLB | PL0 | PL1 |
| PL2 | PL3 | LG0 | LG1 | LG2 | LG3 | LG4 |
| LG5 | LG6 | LG7 | LGB | LGDB | SG0 | SG1 |
| SG2 | SG3 | SGB | R0 | W0 | RD0 | WD0 |
| WS0 | RBL | WBL | RDBL | WDBL | SLDB | SGDB |

**aiMem3**

| | | | | | | |
|---|---|---|---|---|---|---|
| R1 | R2 | R3 | R4 | RB | W1 | W2 |
| WB | RDB | WDB | WSB | WSDB | | |

**aiAlu**

| | | | | | | |
|---|---|---|---|---|---|---|
| NO-OP | LADRB | GADRB | LP | PUSH | POP | EXCH |
| DUP | NILCK | NILCKL | BNDCK | ADD | SUB | DBL |
| NEG | INC | AND | OR | XOR | SHIFT | DADD |
| DSUB | DCOMP | DUCOMP | ADD01 | IWDC | DWDC | |
| CATCH | WR | RR | | | | |

**aiImmed**

| | | | | | | |
|---|---|---|---|---|---|---|
| LI0 | LI1 | LI2 | LI3 | LI4 | LI5 | LI6 |
| LIN1 | LINI | LIB | LIW | LINB | LCO | |

**aiMem2Plus**

| | | | | | | |
|---|---|---|---|---|---|---|
| RXLP | WXLP | RILP | RIGP | WILP | RIL0 | RXLPL |
| WXLPL | RXGPL | WXGPL | RILPL | WILPL | RIGPL | WIGPL |
| RFL | WFL | RFSL | WFSL | LLKB | DESCB | DESCBS |

**aiMem3Plus**

| | | | | | |
|---|---|---|---|---|---|
| RF | WF | WSF | RFC | RFS | WFS |

**aiAluPlus**

| | | | | |
|---|---|---|---|---|
| RSTR | WSTR | RSTRL | WSTRL | LINKB |

## A.2 Program Interface

The definitions module, pairfreqdefs, defines the supported program facilities. Each procedure is defined below.

**processTable: PROC** This routine provides the standard analysis upon the contents of pairData.

**zeroTable: PROC** This routine zeros the contents of pairData.

**startPairFreq: PROC** Start-up the microcode that collects pair frequency data. pairData is kept in a standard place understood by the implementation routines.

**stopPairFreq: PROC** Turn-off the microcode that collects pair frequency data.

**maybePausePairFreq: PROC** Cause the pair data collector to stop, if it is currently on. This routine works only if the user manipulates the pair data collection mechanism through these interfaces. (The miscellaneous instruction is defined below and it may be invoked directly by the programmer).

**maybeResumePairFreq: PROC** Resume collecting pair data iff maybePausePairFreq caused it to stop.

**questions: PROC** Invoke the query mechanism described in section 5.2 above.

**banksToLOP: PROC[n: CARDINAL] RETURNS [lp: LONG ORDERED POINTER]** This routine takes a "bank number" and returns a LONG ORDERED POINTER.

**numberToLOP: PROC[n: CARDINAL] RETURNS [lp: LONG ORDERED POINTER]** This routine takes a CARDINAL and returns a LONG ORDERED POINTER whose arithmetic value is the same as the CARDINAL.

**copyTable: PROC RETURNS[p:LONG POINTER TO ListSort.Node]** This routine reaches into the memory unknown to Mesa and copies the pairData into a more compact data structure. Programs that use this procedure must not be compiled with bounds checking because p will be greater than the last address that Mesa thinks exists.

**setInstructionPairs: PROC[n: CARDINAL]** Cause the pair data collector to collect data in bank "n". The "maybe..." routines will not work properly if the investigator employs this procedure.

**saveData: PROC[fname:STRING, comment: STRING] RETURNS[BOOLEAN]** Save the contents of pairData by appending them onto the file named by fname. Insert the comment string at the beginning of the file. This routine returns TRUE if it succeeds in its appointed task.

**readData: PROC[fname:STRING] RETURNS[BOOLEAN]** This routine reads the file named by fname and initializes pairData accordingly.

**showOpcode: PROC[[0..400)]** This routine takes an instruction as a parameter and writes its string name on the default output stream.

**setMicroPairsBR: PROC[LONG POINTER] RETURNS[CARDINAL]**=MACHINE CODE{ Mopcodes.zMISC, 251B} This routine actually starts-up the pair collection microcode. The value it returns is of diagnostic interest, only.

**iAddr: LONG ORDERED POINTER** This variable points to the base of pairData.

c: McDaniel

```
Alto/Mesa 6.0 of 13-Oct-80 11:47
12-May-81 10:04
>pairfreq -- 135454B

Standard option:
1) Print current table (Standard analysis).
2) Append current table onto 'paircounts.log'.
3) Zero current Table.  Type CR or Y(y)es for Standard option>
a=ask questions,
c=input comment string,
f=useFile name,
g=print opcode Groups,
k=KILL paircounts.log,
o=Old data(add it to current table)
p=process table,
q=QUIT
r=regular option,
s=save it,
z=Zero current table

>
type file name terminated by CR.>compiler.counts

>
type comment string terminated by CR. You must still execute the 's' command>compile sypy sources with
**DiskIO turning OFF micropcxpair counting.

>
Save data on compiler.counts
Comment is 'compile spy sources with DiskIO turning OFF pair counting.'
>
Zero table
Done Zeroing Table

>compile spy sources with DiskIO turning OFF pair counting.
(12-May-81 10:04:57)

>
Copied 7976 records

233140374 pairs

Instruction Frequencies by Opcode
NOOP    (  0)         0 0
ME      (  1)      4741 0.002033539
MRE     (  2)     10248 0.0043956356
MXW     (  3)      8686 0.0037256525
MXD     (  4)      4722 0.0020253892
NOTIFY  (  5)        14 6.0049653e-06
BCAST   (  6)         9 3.8603354e-06
REQUEUE (  7)        19 8.149597e-06
LL0     ( 10)  20882147 8.9569
LL1     ( 11)   5605261 2.404243
LL2     ( 12)   3781745 1.6220894
LL3     ( 13)   2860550 1.2269647
LL4     ( 14)   1166026 0.50013905
LL5     ( 15)   1629637 0.6989939
LL6     ( 16)    723409 0.31028905
LL7     ( 17)    286525 0.122898054
LLB     ( 20)   3430454 1.4714115
LLDB    ( 21)   1465776 0.6287097
SL0     ( 22)   2286276 0.98064356
SL1     ( 23)   2346204 1.0063483
SL2     ( 24)   1375542 0.5900059
SL3     ( 25)   1192021 0.5112889
SL4     ( 26)    959190 0.41142168
SL5     ( 27)    660092 0.28313074
SL6     ( 30)    535088 0.22951322
SL7     ( 31)    276920 0.11877823
SLB     ( 32)   2254568 0.9670431
PL0     ( 33)   3144341 1.34869
PL1     ( 34)    928234 0.39814386
PL2     ( 35)    834472 0.35792687
PL3     ( 36)    383044 0.16429758
LG0     ( 37)   6967303 2.9884584
LG1     ( 40)   1653831 0.7093714
```

| | | | |
|---|---|---|---|
| LG2 | ( 41) | 340142 | 0.14589581 |
| LG3 | ( 42) | 531908 | 0.22814927 |
| LG4 | ( 43) | 534721 | 0.22935581 |
| LG5 | ( 44) | 764367 | 0.327857 |
| LG6 | ( 45) | 780393 | 0.33473096 |
| LG7 | ( 46) | 288892 | 0.123913336 |
| LGB | ( 47) | 2908696 | 1.2476157 |
| LGDB | ( 50) | 186500 | 0.079994726 |
| SG0 | ( 51) | 236538 | 0.10145733 |
| SG1 | ( 52) | 407335 | 0.17471662 |
| SG2 | ( 53) | 21946 | 0.009413213 |
| SG3 | ( 54) | 34216 | 0.014676137 |
| SGB | ( 55) | 693947 | 0.29765203 |
| LI0 | ( 56) | 3594730 | 1.5418737 |
| LI1 | ( 57) | 2609636 | 1.1193411 |
| LI2 | ( 60) | 1471740 | 0.6312678 |
| LI3 | ( 61) | 1175431 | 0.5041731 |
| LI4 | ( 62) | 295750 | 0.12685491 |
| LI5 | ( 63) | 435327 | 0.18672313 |
| LI6 | ( 64) | 123858 | 0.05312593 |
| LIN1 | ( 65) | 605516 | 0.25972164 |
| LINI | ( 66) | 12611 | 0.005409188 |
| LIB | ( 67) | 3717147 | 1.5943816 |
| LIW | ( 70) | 12610361 | 5.4089136 |
| LINB | ( 71) | 0 | 0 |
| LADRB | ( 72) | 1210940 | 0.51940384 |
| GADRB | ( 73) | 337893 | 0.14493114 |
| LCO | ( 74) | 0 | 0 |
| 75 | ( 75) | 0 | 0 |
| 76 | ( 76) | 0 | 0 |
| 77 | ( 77) | 0 | 0 |
| R0 | (100) | 10817909 | 4.6400843 |
| R1 | (101) | 405708 | 0.17401876 |
| R2 | (102) | 20836 | 0.008937105 |
| R3 | (103) | 49757 | 0.021342077 |
| R4 | (104) | 29708 | 0.012742537 |
| RB | (105) | 460332 | 0.19744844 |
| W0 | (106) | 256547 | 0.11003972 |
| W1 | (107) | 21213 | 0.00909881 |
| W2 | (110) | 23821 | 0.01021745 |
| WB | (111) | 392025 | 0.16814978 |
| RF | (112) | 17463158 | 7.4904056 |
| WF | (113) | 1128552 | 0.48406549 |
| RDB | (114) | 22649 | 0.009714747 |
| RD0 | (115) | 58646 | 0.025154803 |
| WDB | (116) | 10686 | 0.0045835047 |
| WD0 | (117) | 19149 | 0.008213507 |
| RSTR | (120) | 1350516 | 0.5792716 |
| WSTR | (121) | 853747 | 0.3661944 |
| RXLP | (122) | 3133505 | 1.3440423 |
| WXLP | (123) | 1600935 | 0.6866829 |
| RILP | (124) | 2730841 | 1.1713291 |
| RIGP | (125) | 645873 | 0.2770318 |
| WILP | (126) | 1053146 | 0.45172186 |
| RIL0 | (127) | 440372 | 0.18888706 |
| WS0 | (130) | 51399 | 0.022046375 |
| WSB | (131) | 150648 | 0.064616866 |
| WSF | (132) | 537936 | 0.23073483 |
| WSDB | (133) | 66335 | 0.028452816 |
| RFC | (134) | 303131 | 0.13002081 |
| RFS | (135) | 60 | 2.5735569e-05 |
| WFS | (136) | 84 | 3.6029797e-05 |
| RBL | (137) | 24668 | 0.0105807495 |
| WBL | (140) | 10124 | 0.0043424482 |
| RDBL | (141) | 0 | 0 |
| WDBL | (142) | 0 | 0 |
| RXLPL | (143) | 0 | 0 |
| WXLPL | (144) | 0 | 0 |
| RXGPL | (145) | 0 | 0 |
| WXGPL | (146) | 0 | 0 |
| RILPL | (147) | 0 | 0 |
| WILPL | (150) | 0 | 0 |
| RIGPL | (151) | 0 | 0 |
| WIGPL | (152) | 0 | 0 |
| RSTRL | (153) | 0 | 0 |
| WSTRL | (154) | 0 | 0 |

| | | | |
|---|---|---|---|
| RFL | (155) | 0 | 0 |
| WFL | (156) | 0 | 0 |
| RFSL | (157) | 0 | 0 |
| WFSL | (160) | 0 | 0 |
| LP | (161) | 0 | 0 |
| SLDB | (162) | 1419336 | 0.60879035 |
| SGDB | (163) | 98238 | 0.042136846 |
| PUSH | (164) | 8182853 | 3.5098395 |
| POP | (165) | 198773 | 0.08525894 |
| EXCH | (166) | 332629 | 0.14267326 |
| LINKB | (167) | 102080 | 0.04378478 |
| DUP | (170) | 217300 | 0.09320565 |
| NILCK | (171) | 0 | 0 |
| NILCKL | (172) | 0 | 0 |
| BNDCK | (173) | 0 | 0 |
| z174 | (174) | 0 | 0 |
| z175 | (175) | 0 | 0 |
| z176 | (176) | 0 | 0 |
| z177 | (177) | 0 | 0 |
| J2 | (200) | 258409 | 0.11083838 |
| J3 | (201) | 234348 | 0.10051798 |
| J4 | (202) | 99520 | 0.04268673 |
| J5 | (203) | 80986 | 0.034737015 |
| J6 | (204) | 93153 | 0.03995576 |
| J7 | (205) | 57540 | 0.02468041 |
| J8 | (206) | 48608 | 0.020849242 |
| J9 | (207) | 17807 | 0.0076378875 |
| JB | (210) | 2644455 | 1.1342759 |
| JW | (211) | 1149992 | 0.49326162 |
| JEQ2 | (212) | 880 | 3.7745502e-04 |
| JEQ3 | (213) | 110792 | 0.047521586 |
| JEQ4 | (214) | 192166 | 0.08242502 |
| JEQ5 | (215) | 344231 | 0.14764967 |
| JEQ6 | (216) | 23846 | 0.010228173 |
| JEQ7 | (217) | 193484 | 0.08299035 |
| JEQ8 | (220) | 33459 | 0.0143514395 |
| JEQ9 | (221) | 17627 | 0.0075606813 |
| JEQB | (222) | 2241176 | 0.96129894 |
| JNE2 | (223) | 195717 | 0.083948135 |
| JNE3 | (224) | 82819 | 0.035523233 |
| JNE4 | (225) | 411515 | 0.17650955 |
| JNE5 | (226) | 399423 | 0.17132297 |
| JNE6 | (227) | 63357 | 0.027175474 |
| JNE7 | (230) | 534244 | 0.22915123 |
| JNE8 | (231) | 90359 | 0.03875734 |
| JNE9 | (232) | 380865 | 0.16336296 |
| JNEB | (233) | 2174935 | 0.9328865 |
| JLB | (234) | 483964 | 0.20758481 |
| JGEB | (235) | 100623 | 0.043159838 |
| JGB | (236) | 337887 | 0.14492856 |
| JLEB | (237) | 137744 | 0.059082007 |
| JULB | (240) | 1931167 | 0.82832804 |
| JUGEB | (241) | 277920 | 0.119207155 |
| JUGB | (242) | 957275 | 0.41060028 |
| JULEB | (243) | 421291 | 0.18070273 |
| JZEQB | (244) | 3086260 | 1.3237777 |
| JZNEB | (245) | 23991607 | 10.2906275 |
| JIB | (246) | 0 | 0 |
| JIW | (247) | 555268 | 0.23816895 |
| ADD | (250) | 11516841 | 4.939874 |
| SUB | (251) | 1504900 | 0.64549093 |
| MUL | (252) | 586483 | 0.25155787 |
| DBL | (253) | 341387 | 0.1464298 |
| DIV | (254) | 49019 | 0.021025531 |
| LDIV | (255) | 19322 | 0.008287711 |
| NEG | (256) | 23119 | 0.009916344 |
| INC | (257) | 2954754 | 1.2673712 |
| AND | (260) | 603497 | 0.25885563 |
| OR | (261) | 45384 | 0.019466383 |
| XOR | (262) | 24146 | 0.010356851 |
| SHIFT | (263) | 1073320 | 0.46037502 |
| DADD | (264) | 95985 | 0.041170478 |
| DSUB | (265) | 63112 | 0.027070384 |
| DCOMP | (266) | 19972 | 0.008566513 |
| DUCOMP | (267) | 65284 | 0.028002014 |
| ADD01 | (270) | 0 | 0 |

| | | | |
|---|---|---|---|
| z271 | (271) | 0 | 0 |
| z272 | (272) | 0 | 0 |
| z273 | (273) | 0 | 0 |
| z274 | (274) | 0 | 0 |
| z275 | (275) | 0 | 0 |
| z276 | (276) | 0 | 0 |
| z277 | (277) | 0 | 0 |
| EFC0 | (300) | 103615 | 0.044443183 |
| EFC1 | (301) | 269551 | 0.115617466 |
| EFC2 | (302) | 151590 | 0.065020914 |
| EFC3 | (303) | 107524 | 0.046119857 |
| EFC4 | (304) | 219011 | 0.09393954 |
| EFC5 | (305) | 191006 | 0.08192747 |
| EFC6 | (306) | 33750 | 0.014476256 |
| EFC7 | (307) | 90955 | 0.039012976 |
| EFC8 | (310) | 20137 | 0.008637286 |
| EFC9 | (311) | 58270 | 0.024993525 |
| EFC10 | (312) | 21050 | 0.009028894 |
| EFC11 | (313) | 94752 | 0.04064161 |
| EFC12 | (314) | 8703 | 0.003732944 |
| EFC13 | (315) | 15254 | 0.00654284 |
| EFC14 | (316) | 43044 | 0.018462696 |
| EFC15 | (317) | 107069 | 0.045924692 |
| EFCB | (320) | 342170 | 0.14676566 |
| LFC1 | (321) | 174262 | 0.07474553 |
| LFC2 | (322) | 136215 | 0.05842617 |
| LFC3 | (323) | 130268 | 0.05587535 |
| LFC4 | (324) | 132151 | 0.05668302 |
| LFC5 | (325) | 31531 | 0.01352447 |
| LFC6 | (326) | 116650 | 0.050034232 |
| LFC7 | (327) | 142077 | 0.060940542 |
| LFC8 | (330) | 30067 | 0.0128965235 |
| LFC9 | (331) | 12138 | 0.0052063055 |
| LFC10 | (332) | 0 | 0 |
| LFC11 | (333) | 31327 | 0.013436971 |
| LFC12 | (334) | 1345 | 5.769057e-04 |
| LFC13 | (335) | 0 | 0 |
| LFC14 | (336) | 1547 | 6.635487e-04 |
| LFC15 | (337) | 11986 | 0.0051411085 |
| LFC16 | (340) | 17170 | 0.0073646617 |
| LFCB | (341) | 241217 | 0.10346428 |
| SFC | (342) | 289729 | 0.12427235 |
| RET | (343) | 4139512 | 1.7755449 |
| LLKB | (344) | 714007 | 0.30625627 |
| PORTO | (345) | 6 | 2.573557e-06 |
| PORTI | (346) | 4 | 1.7157047e-06 |
| KFCB | (347) | 43245 | 0.018548912 |
| DESCB | (350) | 66047 | 0.028329287 |
| DESCBS | (351) | 25289 | 0.010847113 |
| BLT | (352) | 131402 | 0.05636176 |
| BLTL | (353) | 189 | 8.106705e-05 |
| BLTC | (354) | 274127 | 0.11758025 |
| BLTCL | (355) | 0 | 0 |
| ALLOC | (356) | 3859 | 0.001655226 |
| FREE | (357) | 3120 | 0.0013382496 |
| IWDC | (360) | 75894 | 0.032552924 |
| DWDC | (361) | 75689 | 0.032464993 |
| STOP | (362) | 4 | 1.7157047e-06 |
| CATCH | (363) | 98437 | 0.042222204 |
| MISC | (364) | 99438 | 0.042651563 |
| BITBLT | (365) | 156 | 6.691248e-05 |
| STARTIO | (366) | 3 | 1.2867785e-06 |
| JRAM | (367) | 0 | 0 |
| DST | (370) | 2277 | 9.766649e-04 |
| LST | (371) | 14 | 6.0049653e-06 |
| LSTF | (372) | 1878 | 8.055233e-04 |
| z373 | (373) | 0 | 0 |
| WR | (374) | 0 | 0 |
| RR | (375) | 0 | 0 |
| BRK | (376) | 0 | 0 |
| z377 | (377) | 2292541 | 0.9833308 |

STATISTICS FOR 'PRINC OPS'

Instruction Frequencies by Group: PRINC OPS

| | | | |
|---|---|---|---|
| Ld/Store | 76875831 | 32.974056 | 32.974056 |
| R/W | 45682849 | 19.59457 | 52.568626 |
| CondJumps | 39216633 | 16.821041 | 69.38966 |
| Ld Immed | 26652107 | 11.4317875 | 80.82145 |
| ALU Ops | 18986525 | 8.143817 | 88.96526 |
| Stack Ops | 9033635 | 3.8747623 | 92.84003 |
| Xfers | 8273905 | 3.5488944 | 96.38892 |
| Jumps | 5240086 | 2.24761 | 98.636536 |
| Misc | 3150364 | 1.3512737 | 99.98781 |
| Processes | 28439 | 0.012198232 | 100.00001 |

OPCODES WITHIN GROUPS OF PRINC OPS

In 'PRINC OPS', Opcode frequencies for 'Ld/Store' (32.974056)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| LL0 | 20882147 | 27.163475 | 27.163475 | 8.9569 | 8.9569 |
| LG0 | 6967303 | 9.063061 | 36.226536 | 2.9884584 | 11.945358 |
| LL1 | 5605261 | 7.291318 | 43.517853 | 2.404243 | 14.349602 |
| LL2 | 3781745 | 4.9192896 | 48.43714 | 1.6220894 | 15.971691 |
| LLB | 3430454 | 4.462331 | 52.89947 | 1.4714115 | 17.443102 |
| PL0 | 3144341 | 4.090155 | 56.989628 | 1.34869 | 18.791792 |
| LGB | 2908696 | 3.7836287 | 60.77326 | 1.2476157 | 20.039408 |
| LL3 | 2860550 | 3.7210002 | 64.494255 | 1.2269647 | 21.266373 |
| SL1 | 2346204 | 3.0519395 | 67.546196 | 1.0063483 | 22.27272 |
| SL0 | 2286276 | 2.9739852 | 70.52018 | 0.98064356 | 23.253365 |
| SLB | 2254568 | 2.9327397 | 73.45292 | 0.9670431 | 24.220407 |
| LG1 | 1653831 | 2.1513014 | 75.60422 | 0.7093714 | 24.92978 |
| LL5 | 1629637 | 2.1198301 | 77.724045 | 0.6989939 | 25.628773 |
| LLDB | 1465776 | 1.90668 | 79.63072 | 0.6287097 | 26.257483 |
| SLDB | 1419336 | 1.8462708 | 81.47699 | 0.60879035 | 26.866272 |
| SL2 | 1375542 | 1.7893035 | 83.2663 | 0.5900059 | 27.456278 |
| SL3 | 1192021 | 1.5505796 | 84.81688 | 0.5112889 | 27.967567 |
| LL4 | 1166026 | 1.5167654 | 86.33364 | 0.50013905 | 28.467707 |
| SL4 | 959190 | 1.2477133 | 87.58135 | 0.41142168 | 28.879128 |
| PL1 | 928234 | 1.2074457 | 88.788795 | 0.39814386 | 29.277271 |
| PL2 | 834472 | 1.0854803 | 89.874275 | 0.35792687 | 29.635199 |
| LG6 | 780393 | 1.0151343 | 90.88941 | 0.33473096 | 29.969929 |
| LG5 | 764367 | 0.9942878 | 91.8837 | 0.327857 | 30.297785 |
| LL6 | 723409 | 0.9410096 | 92.82471 | 0.31028905 | 30.608074 |
| SGB | 693947 | 0.90268555 | 93.727394 | 0.29765203 | 30.905725 |
| SL5 | 660092 | 0.85864697 | 94.586044 | 0.28313074 | 31.188856 |
| SL6 | 535088 | 0.69604187 | 95.28209 | 0.22951322 | 31.41837 |
| LG4 | 534721 | 0.6955645 | 95.97765 | 0.22935581 | 31.647724 |
| LG3 | 531908 | 0.6919053 | 96.669556 | 0.22814927 | 31.875874 |
| SG1 | 407335 | 0.5298609 | 97.19942 | 0.17471662 | 32.05059 |
| PL3 | 383044 | 0.49826322 | 97.69768 | 0.16429758 | 32.21489 |
| LG2 | 340142 | 0.44245634 | 98.14014 | 0.14589581 | 32.360786 |
| LG7 | 288892 | 0.3757904 | 98.51593 | 0.123913336 | 32.4847 |
| LL7 | 286525 | 0.37271142 | 98.88864 | 0.122898054 | 32.607597 |
| SL7 | 276920 | 0.36021724 | 99.248856 | 0.11877823 | 32.726376 |
| SG0 | 236538 | 0.30768838 | 99.55654 | 0.10145733 | 32.82783 |
| LGDB | 186500 | 0.24259901 | 99.79914 | 0.079994726 | 32.907825 |
| SGDB | 98238 | 0.12778789 | 99.926926 | 0.042136846 | 32.949963 |
| SG3 | 34216 | 0.044508133 | 99.971436 | 0.014676137 | 32.964638 |
| SG2 | 21946 | 0.028547335 | 99.999985 | 0.009413213 | 32.974052 |

In 'PRINC OPS', Opcode frequencies for 'R/W' (19.594568)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RF | 17463158 | 38.226948 | 38.226948 | 7.4904056 | 40.46446 |
| R0 | 10817909 | 23.68046 | 61.90741 | 4.6400843 | 45.10454 |
| RXLP | 3133505 | 6.859259 | 68.76667 | 1.3440423 | 46.448586 |
| RILP | 2730841 | 5.9778256 | 74.7445 | 1.1713291 | 47.619915 |
| WXLP | 1600935 | 3.5044556 | 78.248955 | 0.6866829 | 48.3066 |
| RSTR | 1350516 | 2.956287 | 81.20524 | 0.5792716 | 48.88587 |
| LADRB | 1210940 | 2.6507542 | 83.855995 | 0.51940384 | 49.405277 |
| WF | 1128552 | 2.4704063 | 86.3264 | 0.48406549 | 49.889343 |
| WILP | 1053146 | 2.3053422 | 88.631744 | 0.45172186 | 50.341064 |
| WSTR | 853747 | 1.8688566 | 90.5006 | 0.3661944 | 50.70726 |
| RIGP | 645873 | 1.4138194 | 91.91442 | 0.2770318 | 50.98429 |
| WSF | 537936 | 1.1775448 | 93.091965 | 0.23073483 | 51.215027 |
| RB | 460332 | 1.0076692 | 94.09963 | 0.19744844 | 51.412476 |
| RIL0 | 440372 | 0.96397667 | 95.06361 | 0.18888706 | 51.601364 |
| R1 | 405708 | 0.888097 | 95.951706 | 0.17401876 | 51.775383 |
| WB | 392025 | 0.85814486 | 96.80985 | 0.16814978 | 51.94353 |
| GADRB | 337893 | 0.7396496 | 97.5495 | 0.14493114 | 52.088463 |
| RFC | 303131 | 0.6635554 | 98.21306 | 0.13002081 | 52.218483 |
| W0 | 256547 | 0.56158276 | 98.77464 | 0.11003972 | 52.32852 |
| WSB | 150648 | 0.32976928 | 99.104416 | 0.064616866 | 52.39314 |

| | | | | | |
|---|---|---|---|---|---|
| WSDB | 66335 | 0.14520767 | 99.249626 | 0.028452816 | 52.421593 |
| RDO | 58646 | 0.12837641 | 99.378006 | 0.025154803 | 52.446747 |
| WSO | 51399 | 0.112512684 | 99.49052 | 0.022046375 | 52.468792 |
| R3 | 49757 | 0.10891833 | 99.599434 | 0.021342077 | 52.490135 |
| R4 | 29708 | 0.065030966 | 99.66447 | 0.012742537 | 52.502876 |
| RBL | 24668 | 0.053998384 | 99.71847 | 0.0105807495 | 52.51346 |
| W2 | 23821 | 0.052144294 | 99.770615 | 0.01021745 | 52.523674 |
| RDB | 22649 | 0.04957878 | 99.82019 | 0.009714747 | 52.53339 |
| W1 | 21213 | 0.04643537 | 99.86662 | 0.00909881 | 52.54249 |
| R2 | 20836 | 0.045610118 | 99.91223 | 0.008937105 | 52.551426 |
| WDO | 19149 | 0.041917267 | 99.95415 | 0.008213507 | 52.55964 |
| WDB | 10686 | 0.023391712 | 99.97754 | 0.0045835047 | 52.564224 |
| WBL | 10124 | 0.022161489 | 99.9997 | 0.0043424482 | 52.568565 |
| WFS | 84 | 1.8387646e-04 | 99.999886 | 3.6029797e-05 | 52.5686 |
| RFS | 60 | 1.3134032e-04 | 100.000015 | 2.5735569e-05 | 52.568626 |
| 75 | 0 | | | | |
| 76 | 0 | | | | |
| 77 | 0 | | | | |
| LCO | 0 | | | | |
| RDBL | 0 | | | | |
| WDBL | 0 | | | | |
| RXLPL | 0 | | | | |
| WXLPL | 0 | | | | |
| RXGPL | 0 | | | | |
| WXGPL | 0 | | | | |
| RILPL | 0 | | | | |
| WILPL | 0 | | | | |
| RIGPL | 0 | | | | |
| WIGPL | 0 | | | | |
| RSTRL | 0 | | | | |
| WSTRL | 0 | | | | |
| RFL | 0 | | | | |
| WFL | 0 | | | | |
| RFSL | 0 | | | | |
| WFSL | 0 | | | | |

In 'PRINC OPS', Opcode frequencies for 'CondJumps' (16.82104)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| JZNEB | 23991607 | 61.177124 | 61.177124 | 10.2906275 | 62.859253 |
| JZEQB | 3086260 | 7.8697734 | 69.0469 | 1.3237777 | 64.18303 |
| JEQB | 2241176 | 5.714861 | 74.76176 | 0.96129894 | 65.144325 |
| JNEB | 2174935 | 5.545951 | 80.30771 | 0.9328865 | 66.07721 |
| JULB | 1931167 | 4.924357 | 85.23206 | 0.82832804 | 66.90554 |
| JUGB | 957275 | 2.4409924 | 87.67306 | 0.41060028 | 67.31614 |
| JNE7 | 534244 | 1.3622893 | 89.03535 | 0.22915123 | 67.54529 |
| JLB | 483964 | 1.2340784 | 90.269424 | 0.20758481 | 67.75288 |
| JULEB | 421291 | 1.0742662 | 91.34369 | 0.18070273 | 67.93358 |
| JNE4 | 411515 | 1.0493379 | 92.39303 | 0.17650955 | 68.110085 |
| JNE5 | 399423 | 1.018504 | 93.41153 | 0.17132297 | 68.28141 |
| JNE9 | 380865 | 0.97118235 | 94.38271 | 0.16336296 | 68.44477 |
| JEQ5 | 344231 | 0.87776794 | 95.26048 | 0.14764967 | 68.59242 |
| JGB | 337887 | 0.86159115 | 96.12207 | 0.14492856 | 68.73735 |
| JUGEB | 277920 | 0.7086789 | 96.83075 | 0.119207155 | 68.85656 |
| JNE2 | 195717 | 0.4990663 | 97.32982 | 0.083948135 | 68.940506 |
| JEQ7 | 193484 | 0.49337234 | 97.82319 | 0.08299035 | 69.0235 |
| JEQ4 | 192166 | 0.49001145 | 98.3132 | 0.08242502 | 69.10593 |
| JLEB | 137744 | 0.35123873 | 98.664444 | 0.059082007 | 69.16501 |
| JEQ3 | 110792 | 0.28251278 | 98.94696 | 0.047521586 | 69.21253 |
| JGEB | 100623 | 0.25658247 | 99.203545 | 0.043159838 | 69.25569 |
| JNE8 | 90359 | 0.23040991 | 99.43395 | 0.03875734 | 69.29445 |
| JNE3 | 82819 | 0.21118336 | 99.645134 | 0.035523233 | 69.32997 |
| JNE6 | 63357 | 0.16155646 | 99.806694 | 0.027175474 | 69.35715 |
| JEQ8 | 33459 | 0.08531839 | 99.89201 | 0.0143514395 | 69.3715 |
| JEQ6 | 23846 | 0.060805836 | 99.95282 | 0.010228173 | 69.38173 |
| JEQ9 | 17627 | 0.044947767 | 99.997765 | 0.0075606813 | 69.38929 |
| JEQ2 | 880 | 0.0022439458 | 100.00001 | 3.7745502e-04 | 69.38966 |

In 'PRINC OPS', Opcode frequencies for 'Ld Immed' (11.431786)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| LIW | 12610361 | 47.314686 | 47.314686 | 5.4089136 | 74.79858 |
| LIB | 3717147 | 13.946917 | 61.261604 | 1.5943816 | 76.39296 |
| LI0 | 3594730 | 13.487601 | 74.74921 | 1.5418737 | 77.93483 |
| LI1 | 2609636 | 9.791481 | 84.54069 | 1.1193411 | 79.05417 |
| LI2 | 1471740 | 5.52204 | 90.06273 | 0.6312678 | 79.68544 |
| LI3 | 1175431 | 4.410274 | 94.473 | 0.5041731 | 80.18961 |
| LIN1 | 605516 | 2.2719252 | 96.74493 | 0.25972164 | 80.44933 |
| LI5 | 435327 | 1.633368 | 98.378296 | 0.18672313 | 80.636055 |
| LI4 | 295750 | 1.1096684 | 99.48796 | 0.12685491 | 80.76291 |
| LI6 | 123858 | 0.4647212 | 99.95268 | 0.05312593 | 80.81603 |
| LINI | 12611 | 0.047317085 | 100.0 | 0.005409188 | 80.82144 |
| LINB | 0 | | | | |

In 'PRINC OPS', Opcode frequencies for 'ALU Ops' (8.143817)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| ADD | 11516841 | 60.657978 | 60.657978 | 4.939874 | 85.761314 |
| INC | 2954754 | 15.562375 | 76.22035 | 1.2673712 | 87.02869 |
| SUB | 1504900 | 7.9261484 | 84.1465 | 0.64549093 | 87.67418 |
| SHIFT | 1073320 | 5.653062 | 89.79956 | 0.46037502 | 88.13455 |
| AND | 603497 | 3.1785543 | 92.97811 | 0.25885563 | 88.39341 |
| MUL | 586483 | 3.0889435 | 96.067055 | 0.25155787 | 88.644966 |
| DBL | 341387 | 1.798049 | 97.865105 | 0.1464298 | 88.7914 |
| DADD | 95985 | 0.50554276 | 98.37065 | 0.041170478 | 88.832565 |
| DUCOMP | 65284 | 0.3438439 | 98.71449 | 0.028002014 | 88.860565 |
| DSUB | 63112 | 0.33240418 | 99.0469 | 0.027070384 | 88.887634 |
| DIV | 49019 | 0.25817785 | 99.30508 | 0.021025531 | 88.90866 |
| OR | 45384 | 0.2390327 | 99.544106 | 0.019466383 | 88.92812 |
| XOR | 24146 | 0.1271744 | 99.67128 | 0.010356851 | 88.93848 |
| NEG | 23119 | 0.121765316 | 99.793045 | 0.009916344 | 88.948395 |
| DCOMP | 19972 | 0.1051904 | 99.89824 | 0.008566513 | 88.95696 |
| LDIV | 19322 | 0.10176692 | 100.00001 | 0.008287711 | 88.96525 |
| ADD01 | 0 | | | | |

In 'PRINC OPS', Opcode frequencies for 'Stack Ops' (3.8747623)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| PUSH | 8182853 | 90.58206 | 90.58206 | 3.5098395 | 92.47509 |
| EXCH | 332629 | 3.6821167 | 94.264175 | 0.14267326 | 92.61776 |
| DUP | 217300 | 2.4054549 | 96.66963 | 0.09320565 | 92.71097 |
| POP | 198773 | 2.2003655 | 98.869995 | 0.08525894 | 92.79623 |
| LINKB | 102080 | 1.1299992 | 99.99999 | 0.04378478 | 92.84001 |
| NILCK | 0 | | | | |
| NILCKL | 0 | | | | |
| BNDCK | 0 | | | | |

In 'PRINC OPS', Opcode frequencies for 'Xfers' (3.5488942)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RET | 4139512 | 50.030933 | 50.030933 | 1.7755449 | 94.615555 |
| LLKB | 714007 | 8.629625 | 58.66056 | 0.30625627 | 94.921814 |
| EFCB | 342170 | 4.1355324 | 62.796093 | 0.14676566 | 95.06858 |
| SFC | 289729 | 3.50172 | 66.29781 | 0.12427235 | 95.192856 |
| EFC1 | 269551 | 3.257845 | 69.55566 | 0.115617466 | 95.30847 |
| LFCB | 241217 | 2.9153948 | 72.471054 | 0.10346428 | 95.411934 |
| EFC4 | 219011 | 2.647009 | 75.118065 | 0.09393954 | 95.505875 |
| EFC5 | 191006 | 2.308535 | 77.4266 | 0.08192747 | 95.5878 |
| LFC1 | 174262 | 2.1061637 | 79.53276 | 0.07474553 | 95.662544 |
| EFC2 | 151590 | 1.8321458 | 81.36491 | 0.065020914 | 95.72756 |
| LFC7 | 142077 | 1.7171698 | 83.08208 | 0.060940542 | 95.788506 |
| LFC2 | 136215 | 1.6463206 | 84.7284 | 0.05842617 | 95.84693 |
| LFC4 | 132151 | 1.5972022 | 86.3256 | 0.05668302 | 95.90362 |
| LFC3 | 130268 | 1.574444 | 87.90005 | 0.05587535 | 95.959496 |
| LFC6 | 116650 | 1.4098543 | 89.3099 | 0.050034232 | 96.00953 |
| EFC3 | 107524 | 1.2995557 | 90.60945 | 0.046119857 | 96.05565 |
| EFC15 | 107069 | 1.2940564 | 91.90351 | 0.045924692 | 96.10157 |

| | | | | | |
|---|---|---|---|---|---|
| EFC0 | 103615 | 1.2523108 | 93.15582 | 0.044443183 | 96.14601 |
| EFC11 | 94752 | 1.1451908 | 94.30101 | 0.04064161 | 96.18665 |
| EFC7 | 90955 | 1.0992995 | 95.40031 | 0.039012976 | 96.22567 |
| EFC9 | 58270 | 0.70426235 | 96.10457 | 0.024993525 | 96.25066 |
| KFCB | 43245 | 0.52266736 | 96.627235 | 0.018548912 | 96.26921 |
| EFC14 | 43044 | 0.520238 | 97.14748 | 0.018462696 | 96.287674 |
| EFC6 | 33750 | 0.40790896 | 97.55538 | 0.014476256 | 96.30215 |
| LFC5 | 31531 | 0.3810897 | 97.93647 | 0.01352447 | 96.315674 |
| LFC11 | 31327 | 0.3786241 | 98.315094 | 0.013436971 | 96.32911 |
| LFC8 | 30067 | 0.3633955 | 98.67849 | 0.0128965235 | 96.342 |
| EFC10 | 21050 | 0.25441432 | 98.93291 | 0.009028894 | 96.35103 |
| EFC8 | 20137 | 0.24337964 | 99.176285 | 0.008637286 | 96.359665 |
| LFC16 | 17170 | 0.20751991 | 99.383804 | 0.0073646617 | 96.36703 |
| EFC13 | 15254 | 0.18436277 | 99.56817 | 0.00654284 | 96.37357 |
| LFC9 | 12138 | 0.14670218 | 99.714874 | 0.0052063055 | 96.37878 |
| LFC15 | 11986 | 0.1448651 | 99.85974 | 0.0051411085 | 96.38392 |
| EFC12 | 8703 | 0.10518612 | 99.96493 | 0.003732944 | 96.38765 |
| LFC14 | 1547 | 0.018697338 | 99.98363 | 6.635487e-04 | 96.38831 |
| LFC12 | 1345 | 0.016255927 | 99.999886 | 5.769057e-04 | 96.38889 |
| PORTO | 6 | 7.251715e-05 | 99.99996 | 2.573557e-06 | 96.38889 |
| PORTI | 4 | 4.8344765e-05 | 100.00001 | 1.7157047e-06 | 96.38889 |
| LFC10 | 0 | | | | |
| LFC13 | 0 | | | | |

In 'PRINC OPS', Opcode frequencies for 'Jumps' (2.2476099)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| JB | 2644455 | 50.46587 | 50.46587 | 1.1342759 | 97.52317 |
| JW | 1149992 | 21.946053 | 72.41193 | 0.49326162 | 98.01643 |
| JIW | 555268 | 10.596543 | 83.00847 | 0.23816895 | 98.2546 |
| J2 | 258409 | 4.9313884 | 87.93986 | 0.11083838 | 98.36544 |
| J3 | 234348 | 4.4722166 | 92.41207 | 0.10051798 | 98.46596 |
| J4 | 99520 | 1.8992056 | 94.31128 | 0.04268673 | 98.508644 |
| J6 | 93153 | 1.7776999 | 96.08898 | 0.03995576 | 98.5486 |
| J5 | 80986 | 1.545509 | 97.63449 | 0.034737015 | 98.583336 |
| J7 | 57540 | 1.0980736 | 98.73257 | 0.02468041 | 98.60802 |
| J8 | 48608 | 0.9276183 | 99.66019 | 0.020849242 | 98.62887 |
| J9 | 17807 | 0.33982265 | 100.00001 | 0.0076378875 | 98.636505 |
| JIB | 0 | | | | |

In 'PRINC OPS', Opcode frequencies for 'Misc' (1.3512735)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| z377 | 2292541 | 72.770676 | 72.770676 | 0.9833308 | 99.619835 |
| BLTC | 274127 | 8.701439 | 81.472115 | 0.11758025 | 99.73741 |
| BLT | 131402 | 4.17101 | 85.64313 | 0.05636176 | 99.79377 |
| MISC | 99438 | 3.156397 | 88.79952 | 0.042651563 | 99.83642 |
| CATCH | 98437 | 3.124623 | 91.92415 | 0.042222204 | 99.87864 |
| IWDC | 75894 | 2.409055 | 94.333206 | 0.032552924 | 99.911194 |
| DWDC | 75689 | 2.4025478 | 96.735756 | 0.032464993 | 99.94366 |
| DESCB | 66047 | 2.096488 | 98.832245 | 0.028329287 | 99.971985 |
| DESCBS | 25289 | 0.80273266 | 99.63498 | 0.010847113 | 99.982834 |
| ALLOC | 3859 | 0.12249379 | 99.75748 | 0.001655226 | 99.98449 |
| FREE | 3120 | 0.09903618 | 99.856514 | 0.0013382496 | 99.985825 |
| DST | 2277 | 0.07227736 | 99.928795 | 9.766649e-04 | 99.9868 |
| LSTF | 1878 | 0.05961216 | 99.9884 | 8.055233e-04 | 99.98761 |
| BLTL | 189 | 0.0059993067 | 99.9944 | 8.106705e-05 | 99.98769 |
| BITBLT | 156 | 0.0049518085 | 99.99935 | 6.691248e-05 | 99.98776 |
| LST | 14 | 4.443931e-04 | 99.999794 | 6.0049653e-06 | 99.98777 |
| STOP | 4 | 1.2696944e-04 | 99.99992 | 1.7157047e-06 | 99.98777 |
| STARTIO | 3 | 9.522709e-05 | 100.000015 | 1.2867785e-06 | 99.98777 |
| BLTCL | 0 | | | | |
| z177 | 0 | | | | |
| z271 | 0 | | | | |
| z272 | 0 | | | | |
| z273 | 0 | | | | |
| z274 | 0 | | | | |
| z275 | 0 | | | | |
| z276 | 0 | | | | |
| z277 | 0 | | | | |

| | |
|---|---|
| NOOP | 0 |
| JRAM | 0 |
| LP | 0 |
| z174 | 0 |
| z175 | 0 |
| z373 | 0 |
| WR | 0 |
| RR | 0 |
| BRK | 0 |
| z176 | 0 |

In 'PRINC OPS', Opcode frequencies for 'Processes' (0.012198231)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| MRE | 10248 | 36.035023 | 36.035023 | 0.0043956356 | 99.992165 |
| MXW | 8686 | 30.542564 | 66.57759 | 0.0037256525 | 99.99589 |
| ME | 4741 | 16.670769 | 83.24836 | 0.002033539 | 99.997925 |
| MXD | 4722 | 16.603958 | 99.85232 | 0.0020253892 | 99.99995 |
| REQUEUE | 19 | 0.06680966 | 99.91913 | 8.149597e-06 | 99.999954 |
| NOTIFY | 14 | 0.049228177 | 99.96835 | 6.0049653e-06 | 99.99996 |
| BCAST | 9 | 0.03164668 | 100.0 | 3.8603354e-06 | 99.99997 |

STATISTICS FOR 'LOCALS VS GLOBALS GROUP'

Instruction Frequencies by Group: LOCALS VS GLOBALS GROUP

| | | | |
|---|---|---|---|
| locals | 61637798 | 26.438066 | 26.438066 |
| CondJumpsInLG | 39216633 | 16.821041 | 43.25911 |
| addresses | 35243351 | 15.116796 | 58.375904 |
| LdImmedInLG | 26652107 | 11.4317875 | 69.80769 |
| AluInLG | 18986525 | 8.143817 | 77.95151 |
| globals | 16786866 | 7.200326 | 85.15183 |
| other | 12212438 | 5.238234 | 90.39007 |
| localsIndir | 8958799 | 3.8426633 | 94.232735 |
| xfersInLG | 7559898 | 3.2426383 | 97.47537 |
| JumpsInLG | 5240086 | 2.24761 | 99.722984 |
| globalsIndir | 645873 | 0.27703185 | 100.000015 |

OPCODES WITHIN GROUPS OF LOCALS VS GLOBALS GROUP

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'locals' (26.438063)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| LL0 | 20882147 | 33.8788 | 33.8788 | 8.9569 | 8.9569 |
| LL1 | 5605261 | 9.093869 | 42.972668 | 2.404243 | 11.361143 |
| LL2 | 3781745 | 6.135432 | 49.1081 | 1.6220894 | 12.9832325 |
| LLB | 3430454 | 5.5655036 | 54.673603 | 1.4714115 | 14.454644 |
| PL0 | 3144341 | 5.1013193 | 59.77492 | 1.34869 | 15.803334 |
| LL3 | 2860550 | 4.640902 | 64.415825 | 1.2269647 | 17.030298 |
| SL1 | 2346204 | 3.8064367 | 68.22226 | 1.0063483 | 18.036646 |
| SL0 | 2286276 | 3.7092109 | 71.93147 | 0.98064356 | 19.01729 |
| SLB | 2254568 | 3.6577682 | 75.58924 | 0.9670431 | 19.984333 |
| LL5 | 1629637 | 2.6438923 | 78.23313 | 0.6989939 | 20.683327 |
| LLDB | 1465776 | 2.3780472 | 80.611176 | 0.6287097 | 21.312037 |
| SLDB | 1419336 | 2.3027039 | 82.91388 | 0.60879035 | 21.920826 |
| SL2 | 1375542 | 2.2316532 | 85.14553 | 0.5900059 | 22.510832 |
| LADRB | 1210940 | 1.9646062 | 87.11014 | 0.51940384 | 23.030235 |
| SL3 | 1192021 | 1.9339124 | 89.04405 | 0.5112889 | 23.541525 |
| LL4 | 1166026 | 1.8917385 | 90.93579 | 0.50013905 | 24.041664 |
| SL4 | 959190 | 1.5561717 | 92.49197 | 0.41142168 | 24.453085 |
| PL1 | 928234 | 1.5059493 | 93.99792 | 0.39814386 | 24.851229 |
| PL2 | 834472 | 1.3538315 | 95.351746 | 0.35792687 | 25.209156 |
| LL6 | 723409 | 1.173645 | 96.52539 | 0.31028905 | 25.519445 |
| SL5 | 660092 | 1.0709207 | 97.59631 | 0.28313074 | 25.802576 |
| SL6 | 535088 | 0.86811657 | 98.46443 | 0.22951322 | 26.03209 |
| PL3 | 383044 | 0.6214433 | 99.08588 | 0.16429758 | 26.196386 |
| LL7 | 286525 | 0.46485276 | 99.55073 | 0.122898054 | 26.319284 |
| SL7 | 276920 | 0.44926977 | 100.0 | 0.11877823 | 26.438063 |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'CondJumpsInLG' (16.82104)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| JZNEB | 23991607 | 61.177124 | 61.177124 | 10.2906275 | 36.72869 |
| JZEQB | 3086260 | 7.8697734 | 69.0469 | 1.3237777 | 38.052467 |
| JEQB | 2241176 | 5.714861 | 74.76176 | 0.96129894 | 39.013767 |
| JNEB | 2174935 | 5.545951 | 80.30771 | 0.9328865 | 39.946655 |
| JULB | 1931167 | 4.924357 | 85.23206 | 0.82832804 | 40.774982 |
| JUGB | 957275 | 2.4409924 | 87.67306 | 0.41060028 | 41.18558 |
| JNE7 | 534244 | 1.3622893 | 89.03535 | 0.22915123 | 41.414734 |
| JLB | 483964 | 1.2340784 | 90.269424 | 0.20758481 | 41.62232 |
| JULEB | 421291 | 1.0742662 | 91.34369 | 0.18070273 | 41.80302 |
| JNE4 | 411515 | 1.0493379 | 92.39303 | 0.17650955 | 41.97953 |
| JNE5 | 399423 | 1.018504 | 93.41153 | 0.17132297 | 42.150852 |
| JNE9 | 380865 | 0.97118235 | 94.38271 | 0.16336296 | 42.314217 |
| JEQ5 | 344231 | 0.87776794 | 95.26048 | 0.14764967 | 42.461864 |
| JGB | 337887 | 0.86159115 | 96.12207 | 0.14492856 | 42.606792 |
| JUGEB | 277920 | 0.7086789 | 96.83075 | 0.119207155 | 42.725998 |
| JNE2 | 195717 | 0.4990663 | 97.32982 | 0.083948135 | 42.809944 |
| JEQ7 | 193484 | 0.49337234 | 97.82319 | 0.08299035 | 42.892933 |
| JEQ4 | 192166 | 0.49001145 | 98.3132 | 0.08242502 | 42.975357 |
| JLEB | 137744 | 0.35123873 | 98.664444 | 0.059082007 | 43.03444 |
| JEQ3 | 110792 | 0.28251278 | 98.94696 | 0.047521586 | 43.08196 |
| JGEB | 100623 | 0.25658247 | 99.203545 | 0.043159838 | 43.12512 |
| JNE8 | 90359 | 0.23040991 | 99.43395 | 0.03875734 | 43.163876 |
| JNE3 | 82819 | 0.21118336 | 99.645134 | 0.035523233 | 43.199398 |
| JNE6 | 63357 | 0.16155646 | 99.806694 | 0.027175474 | 43.226574 |
| JEQ8 | 33459 | 0.08531839 | 99.89201 | 0.0143514395 | 43.240925 |
| JEQ6 | 23846 | 0.060805836 | 99.95282 | 0.010228173 | 43.251152 |
| JEQ9 | 17627 | 0.044947767 | 99.997765 | 0.0075606813 | 43.258713 |
| JEQ2 | 880 | 0.0022439458 | 100.00001 | 3.7745502e-04 | 43.25909 |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'addresses' (15.116796)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| RF | 17463158 | 49.550217 | 49.550217 | 7.4904056 | 50.749496 |
| R0 | 10817909 | 30.694893 | 80.24511 | 4.6400843 | 55.38958 |
| RSTR | 1350516 | 3.8319736 | 84.07708 | 0.5792716 | 55.968853 |
| WF | 1128552 | 3.2021697 | 87.27925 | 0.48406549 | 56.45292 |
| WSTR | 853747 | 2.422434 | 89.70168 | 0.3661944 | 56.819115 |
| LLKB | 714007 | 2.025934 | 91.727615 | 0.30625627 | 57.12537 |
| WSF | 537936 | 1.5263474 | 93.25396 | 0.23073483 | 57.356106 |
| RB | 460332 | 1.3061527 | 94.56011 | 0.19744844 | 57.553555 |
| R1 | 405708 | 1.1511618 | 95.71127 | 0.17401876 | 57.727573 |
| WB | 392025 | 1.1123374 | 96.82361 | 0.16814978 | 57.89572 |
| RFC | 303131 | 0.8601083 | 97.683716 | 0.13002081 | 58.02574 |
| W0 | 256547 | 0.72793016 | 98.411644 | 0.11003972 | 58.13578 |
| WSB | 150648 | 0.42745085 | 98.839096 | 0.064616866 | 58.200397 |
| WSDB | 66335 | 0.18821989 | 99.02731 | 0.028452816 | 58.22885 |
| RD0 | 58646 | 0.16640301 | 99.19372 | 0.025154803 | 58.254005 |
| WS0 | 51399 | 0.14584027 | 99.33956 | 0.022046375 | 58.27605 |
| R3 | 49757 | 0.14118123 | 99.48074 | 0.021342077 | 58.297394 |
| R4 | 29708 | 0.08429392 | 99.56504 | 0.012742537 | 58.310135 |
| RBL | 24668 | 0.06999335 | 99.63503 | 0.0105807495 | 58.320717 |
| W2 | 23821 | 0.067590055 | 99.70262 | 0.01021745 | 58.330933 |
| RDB | 22649 | 0.0642646 | 99.766884 | 0.009714747 | 58.34065 |
| W1 | 21213 | 0.060190077 | 99.82707 | 0.00909881 | 58.349747 |
| R2 | 20836 | 0.05912037 | 99.88619 | 0.008937105 | 58.358685 |
| WD0 | 19149 | 0.05433365 | 99.94053 | 0.008213507 | 58.366898 |
| WDB | 10686 | 0.030320611 | 99.97085 | 0.0045835047 | 58.371483 |
| WBL | 10124 | 0.028725985 | 99.99957 | 0.0043424482 | 58.375824 |
| WFS | 84 | 2.3834281e-04 | 99.99981 | 3.6029797e-05 | 58.37586 |
| RFS | 60 | 1.7024486e-04 | 99.99998 | 2.5735569e-05 | 58.375885 |
| LC0 | 0 | | | | |
| 75 | 0 | | | | |
| 76 | 0 | | | | |
| RDBL | 0 | | | | |
| WDBL | 0 | | | | |
| RSTRL | 0 | | | | |
| WSTRL | 0 | | | | |
| RFL | 0 | | | | |
| WFL | 0 | | | | |
| RFSL | 0 | | | | |
| WFSL | 0 | | | | |
| 77 | 0 | | | | |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'LdImmedInLG' (11.431786)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| LIW | 12610361 | 47.314686 | 47.314686 | 5.4089136 | 63.784798 |
| LIB | 3717147 | 13.946917 | 61.261604 | 1.5943816 | 65.37918 |
| LI0 | 3594730 | 13.487601 | 74.74921 | 1.5418737 | 66.92105 |
| LI1 | 2609636 | 9.791481 | 84.54069 | 1.1193411 | 68.04039 |
| LI2 | 1471740 | 5.52204 | 90.06273 | 0.6312678 | 68.67166 |
| LI3 | 1175431 | 4.410274 | 94.473 | 0.5041731 | 69.175835 |
| LIN1 | 605516 | 2.2719252 | 96.74493 | 0.25972164 | 69.435555 |
| LI5 | 435327 | 1.633368 | 98.378296 | 0.18672313 | 69.62228 |
| LI4 | 295750 | 1.1096684 | 99.48796 | 0.12685491 | 69.74913 |
| LI6 | 123858 | 0.4647212 | 99.95268 | 0.05312593 | 69.80225 |
| LINI | 12611 | 0.047317085 | 100.0 | 0.005409188 | 69.80766 |
| LINB | 0 | | | | |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'AluInLG' (8.143817)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| ADD | 11516841 | 60.657978 | 60.657978 | 4.939874 | 74.747536 |
| INC | 2954754 | 15.562375 | 76.22035 | 1.2673712 | 76.01491 |
| SUB | 1504900 | 7.9261484 | 84.1465 | 0.64549093 | 76.6604 |
| SHIFT | 1073320 | 5.653062 | 89.79956 | 0.46037502 | 77.12077 |
| AND | 603497 | 3.1785543 | 92.97811 | 0.25885563 | 77.37963 |
| MUL | 586483 | 3.0889435 | 96.067055 | 0.25155787 | 77.63119 |
| DBL | 341387 | 1.798049 | 97.865105 | 0.1464298 | 77.77762 |
| DADD | 95985 | 0.50554276 | 98.37065 | 0.041170478 | 77.81879 |
| DUCOMP | 65284 | 0.3438439 | 98.71449 | 0.028002014 | 77.84679 |
| DSUB | 63112 | 0.33240418 | 99.0469 | 0.027070384 | 77.873856 |

| | | | | | |
|---|---|---|---|---|---|
| DIV | 49019 | 0.25817785 | 99.30508 | 0.021025531 | 77.89488 |
| OR | 45384 | 0.2390327 | 99.544106 | 0.019466383 | 77.914345 |
| XOR | 24146 | 0.1271744 | 99.67128 | 0.010356851 | 77.9247 |
| NIG | 23119 | 0.121765316 | 99.793045 | 0.009916344 | 77.934616 |
| DCOMP | 19972 | 0.1051904 | 99.89824 | 0.008566513 | 77.943184 |
| LDIV | 19322 | 0.10176692 | 100.00001 | 0.008287711 | 77.95147 |
| ADD01 | 0 | | | | |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'globals' (7.200326)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| LG0 | 6967303 | 41.50449 | 41.50449 | 2.9884584 | 80.939926 |
| LGB | 2908696 | 17.327213 | 58.831703 | 1.2476157 | 82.18754 |
| LG1 | 1653831 | 9.851934 | 68.68364 | 0.7093714 | 82.89691 |
| LG6 | 780393 | 4.648831 | 73.33247 | 0.33473096 | 83.23164 |
| LG5 | 764367 | 4.5533633 | 77.88583 | 0.327857 | 83.5595 |
| SGB | 693947 | 4.1338687 | 82.0197 | 0.29765203 | 83.857155 |
| LG4 | 534721 | 3.1853535 | 85.205055 | 0.22935581 | 84.08651 |
| LG3 | 531908 | 3.1685963 | 88.37365 | 0.22814927 | 84.31466 |
| SG1 | 407335 | 2.42651 | 90.80016 | 0.17471662 | 84.48937 |
| LG2 | 340142 | 2.026239 | 92.8264 | 0.14589581 | 84.63527 |
| GADRB | 337893 | 2.0128415 | 94.83924 | 0.14493114 | 84.7802 |
| LG7 | 288892 | 1.7209407 | 96.56018 | 0.123913336 | 84.90411 |
| SG0 | 236538 | 1.409066 | 97.969246 | 0.10145733 | 85.00557 |
| LGDB | 186500 | 1.1109877 | 99.08023 | 0.079994726 | 85.08556 |
| SGDB | 98238 | 0.5852075 | 99.665436 | 0.042136846 | 85.1277 |
| SG3 | 34216 | 0.20382602 | 99.86926 | 0.014676137 | 85.14238 |
| SG2 | 21946 | 0.13073316 | 99.99999 | 0.009413213 | 85.151794 |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'other' (5.238234)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| PUSH | 8182853 | 67.00425 | 67.00425 | 3.5098395 | 88.66164 |
| z377 | 2292541 | 18.772182 | 85.77643 | 0.9833308 | 89.644966 |
| EXCH | 332629 | 2.7236903 | 88.50012 | 0.14267326 | 89.787636 |
| BLTC | 274127 | 2.2446542 | 90.744774 | 0.11758025 | 89.90521 |
| DUP | 217300 | 1.7793335 | 92.52411 | 0.09320565 | 89.99842 |
| POP | 198773 | 1.6276276 | 94.15173 | 0.08525894 | 90.08368 |
| BLT | 131402 | 1.0759686 | 95.2277 | 0.05636176 | 90.14004 |
| LINKB | 102080 | 0.8358692 | 96.06357 | 0.04378478 | 90.18382 |
| MISC | 99438 | 0.8142355 | 96.8778 | 0.042651563 | 90.22647 |
| CATCH | 98437 | 0.80603895 | 97.68384 | 0.042222204 | 90.26869 |
| IWDC | 75894 | 0.6214484 | 98.30528 | 0.032552924 | 90.30125 |
| DWDC | 75689 | 0.6197698 | 98.92505 | 0.032464993 | 90.33371 |
| DESCB | 66047 | 0.5408175 | 99.465866 | 0.028329287 | 90.36204 |
| DESCBS | 25289 | 0.20707579 | 99.67294 | 0.010847113 | 90.37289 |
| MRE | 10248 | 0.08391445 | 99.75686 | 0.0043956356 | 90.37728 |
| MXW | 8686 | 0.07112421 | 99.82798 | 0.0037256525 | 90.381004 |
| ME | 4741 | 0.038821077 | 99.8668 | 0.002033539 | 90.38304 |
| MXD | 4722 | 0.0386655 | 99.905464 | 0.0020253892 | 90.38506 |
| ALLOC | 3859 | 0.031598928 | 99.937065 | 0.001655226 | 90.38672 |
| FREE | 3120 | 0.025547724 | 99.962616 | 0.0013382496 | 90.388054 |
| DST | 2277 | 0.018644926 | 99.98126 | 9.766649e-04 | 90.38903 |
| LSTF | 1878 | 0.015377766 | 99.99664 | 8.055233e-04 | 90.38984 |
| BLTL | 189 | 0.0015476026 | 99.99819 | 8.106705e-05 | 90.38992 |
| BITBLT | 156 | 0.0012773862 | 99.999466 | 6.691248e-05 | 90.38999 |
| REQUEUE | 19 | 1.5557909e-04 | 99.99962 | 8.149597e-06 | 90.39 |
| NOTIFY | 14 | 1.1463723e-04 | 99.99973 | 6.0049653e-06 | 90.39001 |
| LST | 14 | 1.1463723e-04 | 99.99985 | 6.0049653e-06 | 90.390015 |
| BCAST | 9 | 7.3695364e-05 | 99.99992 | 3.8603354e-06 | 90.39002 |
| STOP | 4 | 3.2753494e-05 | 99.999954 | 1.7157047e-06 | 90.39002 |
| STARTIO | 3 | 2.4565122e-05 | 99.99998 | 1.2867785e-06 | 90.39002 |
| NILCK | 0 | | | | |
| NILCKL | 0 | | | | |
| BNDCK | 0 | | | | |
| BLTCL | 0 | | | | |
| z174 | 0 | | | | |
| z175 | 0 | | | | |
| z176 | 0 | | | | |
| z177 | 0 | | | | |

| | |
|---|---|
| z271 | 0 |
| z272 | 0 |
| z273 | 0 |
| z274 | 0 |
| z275 | 0 |
| JRAM | 0 |
| z276 | 0 |
| z277 | 0 |
| LP | 0 |
| z373 | 0 |
| WR | 0 |
| RR | 0 |
| BRK | 0 |
| NOOP | 0 |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'localsIndir' (3.842663)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RXLP | 3133505 | 34.976845 | 34.976845 | 1.3440423 | 91.73406 |
| RILP | 2730841 | 30.48222 | 65.45906 | 1.1713291 | 92.90539 |
| WXLP | 1600935 | 17.869972 | 83.32903 | 0.6866829 | 93.59207 |
| WILP | 1053146 | 11.755438 | 95.08447 | 0.45172186 | 94.04379 |
| RIL0 | 440372 | 4.915525 | 100.0 | 0.18888706 | 94.23268 |
| RXLPL | 0 | | | | |
| WXLPL | 0 | | | | |
| RILPL | 0 | | | | |
| WILPL | 0 | | | | |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'xfersInLG' (3.2426379)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RET | 4139512 | 54.756187 | 54.756187 | 1.7755449 | 96.008224 |
| EFCB | 342170 | 4.526119 | 59.282307 | 0.14676566 | 96.15499 |
| SFC | 289729 | 3.832446 | 63.114754 | 0.12427235 | 96.27927 |
| EFC1 | 269551 | 3.5655375 | 66.68029 | 0.115617466 | 96.39488 |
| LFCB | 241217 | 3.190744 | 69.87103 | 0.10346428 | 96.498344 |
| EFC4 | 219011 | 2.89701 | 72.76804 | 0.09393954 | 96.592285 |
| EFC5 | 191006 | 2.5265684 | 75.29461 | 0.08192747 | 96.67421 |
| LFC1 | 174262 | 2.305084 | 77.59969 | 0.07474553 | 96.748955 |
| EFC2 | 151590 | 2.0051858 | 79.60488 | 0.065020914 | 96.81397 |
| LFC7 | 142077 | 1.8793509 | 81.48423 | 0.060940542 | 96.874916 |
| LFC2 | 136215 | 1.8018101 | 83.28604 | 0.05842617 | 96.93334 |
| LFC4 | 132151 | 1.7480526 | 85.034096 | 0.05668302 | 96.99003 |
| LFC3 | 130268 | 1.723145 | 86.75724 | 0.05587535 | 97.045906 |
| LFC6 | 116650 | 1.5430102 | 88.30025 | 0.050034232 | 97.09594 |
| EFC3 | 107524 | 1.4222944 | 89.72254 | 0.046119857 | 97.14206 |
| EFC15 | 107069 | 1.4162757 | 91.13882 | 0.045924692 | 97.18798 |
| EFC0 | 103615 | 1.3705873 | 92.50941 | 0.044443183 | 97.23242 |
| EFC11 | 94752 | 1.2533503 | 93.76276 | 0.04064161 | 97.27306 |
| EFC7 | 90955 | 1.2031246 | 94.96588 | 0.039012976 | 97.31208 |
| EFC9 | 58270 | 0.7707776 | 95.73666 | 0.024993525 | 97.337074 |
| KFCB | 43245 | 0.57203155 | 96.308685 | 0.018548912 | 97.35562 |
| EFC14 | 43044 | 0.56937275 | 96.87806 | 0.018462696 | 97.374084 |
| EFC6 | 33750 | 0.4464346 | 97.32449 | 0.014476256 | 97.38856 |
| LFC5 | 31531 | 0.41708236 | 97.74158 | 0.01352447 | 97.402084 |
| LFC11 | 31327 | 0.4143839 | 98.15596 | 0.013436971 | 97.41552 |
| LFC8 | 30067 | 0.39771702 | 98.55368 | 0.0128965235 | 97.42841 |
| EFC10 | 21050 | 0.2784429 | 98.83212 | 0.009028894 | 97.43744 |
| EFC8 | 20137 | 0.26636603 | 99.09849 | 0.008637286 | 97.446075 |
| LFC16 | 17170 | 0.22711947 | 99.32561 | 0.0073646617 | 97.45344 |
| EFC13 | 15254 | 0.20177522 | 99.52738 | 0.00654284 | 97.459984 |
| LFC9 | 12138 | 0.16055772 | 99.68794 | 0.0052063055 | 97.46519 |
| LFC15 | 11986 | 0.1585471 | 99.84649 | 0.0051411085 | 97.47033 |
| EFC12 | 8703 | 0.1151206 | 99.96161 | 0.003732944 | 97.47406 |
| LFC14 | 1547 | 0.02046324 | 99.98207 | 6.635487e-04 | 97.474724 |
| LFC12 | 1345 | 0.017791245 | 99.99986 | 5.769057e-04 | 97.4753 |
| PORTO | 6 | 7.9366155e-05 | 99.99994 | 2.573557e-06 | 97.4753 |
| PORTI | 4 | 5.2910767e-05 | 99.99999 | 1.7157047e-06 | 97.4753 |
| LFC13 | 0 | | | | |
| LFC10 | 0 | | | | |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'JumpsInLG' (2.2476099)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| JB | 2644455 | 50.46587 | 50.46587 | 1.1342759 | 98.60958 |
| JW | 1149992 | 21.946053 | 72.41193 | 0.49326162 | 99.102844 |
| JIW | 555268 | 10.596543 | 83.00847 | 0.23816895 | 99.34101 |
| J2 | 258409 | 4.9313884 | 87.93986 | 0.11083838 | 99.45185 |
| J3 | 234348 | 4.4722166 | 92.41207 | 0.10051798 | 99.55237 |
| J4 | 99520 | 1.8992056 | 94.31128 | 0.04268673 | 99.595055 |
| J6 | 93153 | 1.7776999 | 96.08898 | 0.03995576 | 99.63501 |
| J5 | 80986 | 1.545509 | 97.63449 | 0.034737015 | 99.66975 |
| J7 | 57540 | 1.0980736 | 98.73257 | 0.02468041 | 99.69443 |
| J8 | 48608 | 0.9276183 | 99.66019 | 0.020849242 | 99.71528 |
| J9 | 17807 | 0.33982265 | 100.00001 | 0.0076378875 | 99.722916 |
| JIB | 0 | | | | |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'globalsIndir' (0.2770318)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RIGP | 645873 | 100.0 | 100.0 | 0.2770318 | 99.99995 |
| RXGPL | 0 | | | | |
| WXGPL | 0 | | | | |
| RIGPL | 0 | | | | |
| WIGPL | 0 | | | | |

STATISTICS FOR 'MEMORY: LOADS VS STORES'

Instruction Frequencies by Group: MEMORY: LOADS VS STORES

| | | | |
|---|---|---|---|
| loads | 94745952 | 40.63901 | 40.63901 |
| ldstOtherJumps | 44456719 | 19.068647 | 59.707657 |
| ldstOtherStackAlu | 27918080 | 11.974793 | 71.68245 |
| ldstOtherImmed | 26652107 | 11.431785 | 83.114235 |
| stores | 26263895 | 11.265271 | 94.37951 |
| ldstOtherXfers | 7559898 | 3.2426376 | 97.62215 |
| ldstOther | 5543723 | 2.3778477 | 99.99999 |

OPCODES WITHIN GROUPS OF MEMORY: LOADS VS STORES

In 'MEMORY: LOADS VS STORES', Opcode frequencies for 'loads' (40.639015)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| LL0 | 20882147 | 22.040148 | 22.040148 | 8.9569 | 8.9569 |
| RF | 17463158 | 18.43156 | 40.47171 | 7.4904056 | 16.447306 |
| R0 | 10817909 | 11.417807 | 51.88952 | 4.6400843 | 21.08739 |
| LG0 | 6967303 | 7.3536677 | 59.243187 | 2.9884584 | 24.07585 |
| LL1 | 5605261 | 5.9160957 | 65.15929 | 2.404243 | 26.480093 |
| LL2 | 3781745 | 3.9914581 | 69.15074 | 1.6220894 | 28.102182 |
| LLB | 3430454 | 3.6206868 | 72.77143 | 1.4714115 | 29.573593 |
| RXLP | 3133505 | 3.3072705 | 76.078705 | 1.3440423 | 30.917635 |
| LGB | 2908696 | 3.069995 | 79.1487 | 1.2476157 | 32.16525 |
| LL3 | 2860550 | 3.019179 | 82.16788 | 1.2269647 | 33.392212 |
| RILP | 2730841 | 2.8822773 | 85.050156 | 1.1713291 | 34.56354 |
| LG1 | 1653831 | 1.7455426 | 86.7957 | 0.7093714 | 35.27291 |
| LL5 | 1629637 | 1.720007 | 88.51571 | 0.6989939 | 35.971905 |
| LLDB | 1465776 | 1.5470592 | 90.06277 | 0.6287097 | 36.600613 |
| RSTR | 1350516 | 1.4254076 | 91.488174 | 0.5792716 | 37.179886 |
| LL4 | 1166026 | 1.2306869 | 92.718864 | 0.50013905 | 37.680023 |
| LG6 | 780393 | 0.82366896 | 93.542534 | 0.33473096 | 38.014755 |
| LG5 | 764367 | 0.8067543 | 94.34929 | 0.327857 | 38.342613 |
| LL6 | 723409 | 0.76352496 | 95.112816 | 0.31028905 | 38.6529 |
| RIGP | 645873 | 0.68168926 | 95.7945 | 0.2770318 | 38.92993 |
| LG4 | 534721 | 0.5643735 | 96.35888 | 0.22935581 | 39.159286 |
| LG3 | 531908 | 0.56140447 | 96.92028 | 0.22814927 | 39.387436 |
| RB | 460332 | 0.4858593 | 97.40614 | 0.19744844 | 39.584885 |
| RIL0 | 440372 | 0.4647924 | 97.87093 | 0.18888706 | 39.773773 |
| R1 | 405708 | 0.42820616 | 98.29914 | 0.17401876 | 39.947792 |
| LG2 | 340142 | 0.35900426 | 98.65814 | 0.14589581 | 40.09369 |
| RFC | 303131 | 0.31994085 | 98.97808 | 0.13002081 | 40.22371 |
| LG7 | 288892 | 0.30491223 | 99.28299 | 0.123913336 | 40.347622 |
| LL7 | 286525 | 0.30241396 | 99.5854 | 0.122898054 | 40.47052 |
| LGDB | 186500 | 0.19684218 | 99.78224 | 0.079994726 | 40.550514 |
| RD0 | 58646 | 0.06189816 | 99.84414 | 0.025154803 | 40.57567 |
| R3 | 49757 | 0.052516227 | 99.89665 | 0.021342077 | 40.59701 |
| R4 | 29708 | 0.03135543 | 99.92801 | 0.012742537 | 40.609753 |
| RBL | 24668 | 0.02603594 | 99.95405 | 0.0105807495 | 40.620335 |
| RDB | 22649 | 0.02390498 | 99.97795 | 0.009714747 | 40.63005 |
| R2 | 20836 | 0.021991441 | 99.99994 | 0.008937105 | 40.63899 |
| RFS | 60 | 6.3327246e-05 | 100.0 | 2.5735569e-05 | 40.639015 |
| RDBL | 0 | | | | |
| RXLPL | 0 | | | | |
| RXGPL | 0 | | | | |
| RILPL | 0 | | | | |
| RIGPL | 0 | | | | |
| RSTRL | 0 | | | | |
| RFL | 0 | | | | |
| RFSL | 0 | | | | |

In 'MEMORY: LOADS VS STORES', Opcode frequencies for 'ldstOtherJumps' (19.06865)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| JZNEB | 23991607 | 53.966213 | 53.966213 | 10.2906275 | 50.92964 |
| JZEQB | 3086260 | 6.9421678 | 60.908382 | 1.3237777 | 52.253418 |
| JB | 2644455 | 5.948381 | 66.856766 | 1.1342759 | 53.387695 |
| JEQB | 2241176 | 5.0412536 | 71.89802 | 0.96129894 | 54.348995 |
| JNEB | 2174935 | 4.8922524 | 76.79027 | 0.9328865 | 55.281883 |
| JULB | 1931167 | 4.343926 | 81.13419 | 0.82832804 | 56.11021 |
| JW | 1149992 | 2.5867674 | 83.72096 | 0.49326162 | 56.603474 |
| JUGB | 957275 | 2.153274 | 85.87424 | 0.41060028 | 57.014072 |
| JIW | 555268 | 1.249008 | 87.123245 | 0.23816895 | 57.252243 |
| JNE7 | 534244 | 1.2017171 | 88.32496 | 0.22915123 | 57.481396 |
| JLB | 483964 | 1.0886183 | 89.413574 | 0.20758481 | 57.68898 |
| JULEB | 421291 | 0.947643 | 90.36121 | 0.18070273 | 57.869682 |
| JNE4 | 411515 | 0.9256531 | 91.286865 | 0.17650955 | 58.046192 |
| JNE5 | 399423 | 0.8984536 | 92.18532 | 0.17132297 | 58.217514 |
| JNE9 | 380865 | 0.8567097 | 93.04203 | 0.16336296 | 58.38088 |

| | | | | | |
|---|---|---|---|---|---|
| JTQ5 | 344231 | 0.77430587 | 93.81634 | 0.14764967 | 58.528526 |
| JGB | 337887 | 0.7600358 | 94.57637 | 0.14492856 | 58.673454 |
| JUGEB | 277920 | 0.62514734 | 95.201515 | 0.119207155 | 58.79266 |
| J2 | 258409 | 0.5812597 | 95.782776 | 0.11083838 | 58.9035 |
| J3 | 234348 | 0.5271374 | 96.30991 | 0.10051798 | 59.004017 |
| JNE2 | 195717 | 0.44024167 | 96.75015 | 0.083948135 | 59.087967 |
| JEQ7 | 193484 | 0.43521876 | 97.18537 | 0.08299035 | 59.170956 |
| JEQ4 | 192166 | 0.43225412 | 97.61762 | 0.08242502 | 59.25338 |
| JLEB | 137744 | 0.3098384 | 97.92746 | 0.059082007 | 59.31246 |
| JEQ3 | 110792 | 0.24921317 | 98.176674 | 0.047521586 | 59.35998 |
| JGEB | 100623 | 0.22633924 | 98.403015 | 0.043159838 | 59.40314 |
| J4 | 99520 | 0.22385817 | 98.62688 | 0.04268673 | 59.445827 |
| J6 | 93153 | 0.20953636 | 98.83641 | 0.03995576 | 59.485783 |
| JNE8 | 90359 | 0.2032516 | 99.039665 | 0.03875734 | 59.52454 |
| JNE3 | 82819 | 0.18629131 | 99.22596 | 0.035523233 | 59.560062 |
| J5 | 80986 | 0.18216819 | 99.40813 | 0.034737015 | 59.5948 |
| JNE6 | 63357 | 0.14251389 | 99.550644 | 0.027175474 | 59.621975 |
| J7 | 57540 | 0.12942924 | 99.68008 | 0.02468041 | 59.646656 |
| J8 | 48608 | 0.10933781 | 99.78941 | 0.020849242 | 59.667507 |
| JEQ8 | 33459 | 0.075261965 | 99.86468 | 0.0143514395 | 59.681858 |
| JEQ6 | 23846 | 0.053638687 | 99.91832 | 0.010228173 | 59.692085 |
| J9 | 17807 | 0.040054684 | 99.958374 | 0.0076378875 | 59.699722 |
| JEQ9 | 17627 | 0.0396498 | 99.998024 | 0.0075606813 | 59.707283 |
| JEQ2 | 880 | 0.0019794533 | 100.0 | 3.7745502e-04 | 59.70766 |
| JIB | 0 | | | | |

In 'MEMORY: LOADS VS STORES', Opcode frequencies for 'ldstOtherStackAlu' (11.974794)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| ADD | 11516841 | 41.252266 | 41.252266 | 4.939874 | 64.64754 |
| PUSH | 8182853 | 29.31023 | 70.5625 | 3.5098395 | 68.15738 |
| INC | 2954754 | 10.583658 | 81.14616 | 1.2673712 | 69.42475 |
| SUB | 1504900 | 5.3904138 | 86.53657 | 0.64549093 | 70.070244 |
| SHIFT | 1073320 | 3.844534 | 90.3811 | 0.46037502 | 70.53062 |
| AND | 603497 | 2.161671 | 92.54278 | 0.25885563 | 70.789474 |
| MUL | 586483 | 2.1007283 | 94.64351 | 0.25155787 | 71.04103 |
| DBL | 341387 | 1.2228168 | 95.866325 | 0.1464298 | 71.18746 |
| EXCH | 332629 | 1.1914465 | 97.05777 | 0.14267326 | 71.33013 |
| DUP | 217300 | 0.77834864 | 97.83612 | 0.09320565 | 71.42334 |
| POP | 198773 | 0.71198664 | 98.54811 | 0.08525894 | 71.5086 |
| DADD | 95985 | 0.34380946 | 98.89192 | 0.041170478 | 71.54977 |
| DUCOMP | 65284 | 0.23384128 | 99.12576 | 0.028002014 | 71.57777 |
| DSUB | 63112 | 0.22606139 | 99.35182 | 0.027070384 | 71.604836 |
| DIV | 49019 | 0.17558156 | 99.527405 | 0.021025531 | 71.62586 |
| OR | 45384 | 0.16256131 | 99.689964 | 0.019466383 | 71.645325 |
| XOR | 24146 | 0.08648875 | 99.77645 | 0.010356851 | 71.65568 |
| NEG | 23119 | 0.082810135 | 99.85926 | 0.009916344 | 71.665596 |
| DCOMP | 19972 | 0.071537876 | 99.9308 | 0.008566513 | 71.674164 |
| LDIV | 19322 | 0.06920963 | 100.00001 | 0.008287711 | 71.68245 |
| LP | 0 | | | | |
| NILCK | 0 | | | | |
| NILCKL | 0 | | | | |
| BNDCK | 0 | | | | |
| ADDO1 | 0 | | | | |

In 'MEMORY: LOADS VS STORES', Opcode frequencies for 'ldstOtherImmed' (11.431786)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| LIW | 12610361 | 47.314686 | 47.314686 | 5.4089136 | 77.09136 |
| LIB | 3717147 | 13.946917 | 61.261604 | 1.5943816 | 78.685745 |
| LI0 | 3594730 | 13.487601 | 74.74921 | 1.5418737 | 80.227615 |
| LI1 | 2609636 | 9.791481 | 84.54069 | 1.1193411 | 81.346954 |
| LI2 | 1471740 | 5.52204 | 90.06273 | 0.6312678 | 81.978226 |
| LI3 | 1175431 | 4.410274 | 94.473 | 0.5041731 | 82.4824 |
| LIN1 | 605516 | 2.2719252 | 96.74493 | 0.25972164 | 82.74212 |
| LI5 | 435327 | 1.633368 | 98.378296 | 0.18672313 | 82.92884 |
| LI4 | 295750 | 1.1096684 | 99.48796 | 0.12685491 | 83.055695 |
| LI6 | 123858 | 0.4647212 | 99.95268 | 0.05312593 | 83.10882 |
| LINI | 12611 | 0.047317085 | 100.0 | 0.005409188 | 83.11423 |
| LINB | 0 | | | | |

LCO 0

In 'MEMORY: LOADS VS STORES', Opcode frequencies for 'stores' (11.265272)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| PL0 | 3144341 | 11.972104 | 11.972104 | 1.34869 | 84.46292 |
| SL1 | 2346204 | 8.933191 | 20.905296 | 1.0063483 | 85.46927 |
| SL0 | 2286276 | 8.705015 | 29.610312 | 0.98064356 | 86.44991 |
| SLB | 2254568 | 8.584287 | 38.1946 | 0.9670431 | 87.416954 |
| WXLP | 1600935 | 6.0955734 | 44.290173 | 0.6866829 | 88.10364 |
| SLDB | 1419336 | 5.4041333 | 49.694305 | 0.60879035 | 88.712425 |
| SL2 | 1375542 | 5.2373877 | 54.931694 | 0.5900059 | 89.30243 |
| SL3 | 1192021 | 4.5386295 | 59.47032 | 0.5112889 | 89.81372 |
| WF | 1128552 | 4.2969713 | 63.767292 | 0.48406549 | 90.29778 |
| WILP | 1053146 | 4.009862 | 67.77715 | 0.45172186 | 90.749504 |
| SL4 | 959190 | 3.6521237 | 71.429276 | 0.41142168 | 91.16093 |
| PL1 | 928234 | 3.5342586 | 74.96353 | 0.39814386 | 91.559074 |
| WSTR | 853747 | 3.2506487 | 78.21418 | 0.3661944 | 91.92527 |
| PL2 | 834472 | 3.1772592 | 81.39144 | 0.35792687 | 92.283195 |
| SGB | 693947 | 2.6422088 | 84.03365 | 0.29765203 | 92.58085 |
| SL5 | 660092 | 2.5133057 | 86.54696 | 0.28313074 | 92.86398 |
| WSF | 537936 | 2.0481956 | 88.59515 | 0.23073483 | 93.09472 |
| SL6 | 535088 | 2.0373518 | 90.63251 | 0.22951322 | 93.324234 |
| SG1 | 407335 | 1.5509314 | 92.18344 | 0.17471662 | 93.49895 |
| WB | 392025 | 1.4926385 | 93.67608 | 0.16814978 | 93.6671 |
| PL3 | 383044 | 1.4584432 | 95.13452 | 0.16429758 | 93.8314 |
| SL7 | 276920 | 1.0543752 | 96.188896 | 0.11877823 | 93.95018 |
| W0 | 256547 | 0.9768048 | 97.1657 | 0.11003972 | 94.06022 |
| SG0 | 236538 | 0.90062037 | 98.06632 | 0.10145733 | 94.161674 |
| WSB | 150648 | 0.5735935 | 98.639915 | 0.064616866 | 94.22629 |
| SGDB | 98238 | 0.374042 | 99.013954 | 0.042136846 | 94.268425 |
| WSDB | 66335 | 0.25257106 | 99.266525 | 0.028452816 | 94.296875 |
| WS0 | 51399 | 0.19570212 | 99.46223 | 0.022046375 | 94.318924 |
| SG3 | 34216 | 0.1302777 | 99.59251 | 0.014676137 | 94.3336 |
| W2 | 23821 | 0.09069865 | 99.683205 | 0.01021745 | 94.34382 |
| SG2 | 21946 | 0.08355958 | 99.76676 | 0.009413213 | 94.35323 |
| W1 | 21213 | 0.08076867 | 99.847534 | 0.00909881 | 94.362335 |
| WD0 | 19149 | 0.072909975 | 99.92044 | 0.008213507 | 94.37055 |
| WDB | 10686 | 0.04068703 | 99.96113 | 0.0045835047 | 94.37514 |
| WBL | 10124 | 0.038547215 | 99.99967 | 0.0043424482 | 94.37948 |
| WFS | 84 | 3.198307e-04 | 99.99999 | 3.6029797e-05 | 94.37952 |
| WXGPL | 0 | | | | |
| WILPL | 0 | | | | |
| WIGPL | 0 | | | | |
| WSTRL | 0 | | | | |
| WFL | 0 | | | | |
| WFSL | 0 | | | | |
| WDBL | 0 | | | | |
| WXLPL | 0 | | | | |

In 'MEMORY: LOADS VS STORES', Opcode frequencies for 'ldstOtherXfers' (3.2426379)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RET | 4139512 | 54.756187 | 54.756187 | 1.7755449 | 96.15506 |
| EFCB | 342170 | 4.526119 | 59.282307 | 0.14676566 | 96.30183 |
| SFC | 289729 | 3.832446 | 63.114754 | 0.12427235 | 96.4261 |
| EFC1 | 269551 | 3.5655375 | 66.68029 | 0.115617466 | 96.54172 |
| LFCB | 241217 | 3.190744 | 69.87103 | 0.10346428 | 96.64518 |
| EFC4 | 219011 | 2.89701 | 72.76804 | 0.09393954 | 96.73912 |
| EFC5 | 191006 | 2.5265684 | 75.29461 | 0.08192747 | 96.821045 |
| LFC1 | 174262 | 2.305084 | 77.59969 | 0.07474553 | 96.89579 |
| EFC2 | 151590 | 2.0051858 | 79.60488 | 0.065020914 | 96.96081 |
| LFC7 | 142077 | 1.8793509 | 81.48423 | 0.060940542 | 97.02175 |
| LFC2 | 136215 | 1.8018101 | 83.28604 | 0.05842617 | 97.08018 |
| LFC4 | 132151 | 1.7480526 | 85.034096 | 0.05668302 | 97.13686 |
| LFC3 | 130268 | 1.723145 | 86.75724 | 0.05587535 | 97.19274 |
| LFC6 | 116650 | 1.5430102 | 88.30025 | 0.050034232 | 97.242775 |
| EFC3 | 107524 | 1.4222944 | 89.72254 | 0.046119857 | 97.288895 |
| EFC15 | 107069 | 1.4162757 | 91.13882 | 0.045924692 | 97.334816 |
| EFC0 | 103615 | 1.3705873 | 92.50941 | 0.044443183 | 97.37926 |

| | | | | | |
|---|---|---|---|---|---|
| EFC11 | 94752 | 1.2533503 | 93.76276 | 0.04064161 | 97.4199 |
| EFC7 | 90955 | 1.2031246 | 94.96588 | 0.039012976 | 97.458916 |
| EFC9 | 58270 | 0.7707776 | 95.73666 | 0.024993525 | 97.48391 |
| KFCB | 43245 | 0.57203155 | 96.308685 | 0.018548912 | 97.50246 |
| EFC14 | 43044 | 0.56937275 | 96.87806 | 0.018462696 | 97.52092 |
| EFC6 | 33750 | 0.4464346 | 97.32449 | 0.014476256 | 97.53539 |
| LFC5 | 31531 | 0.41708236 | 97.74158 | 0.01352447 | 97.54892 |
| LFC11 | 31327 | 0.4143839 | 98.15596 | 0.013436971 | 97.562355 |
| LFC8 | 30067 | 0.39771702 | 98.55368 | 0.0128965235 | 97.57525 |
| EFC10 | 21050 | 0.2784429 | 98.83212 | 0.009028894 | 97.584274 |
| EFC8 | 20137 | 0.26636603 | 99.09849 | 0.008637286 | 97.59291 |
| LFC16 | 17170 | 0.22711947 | 99.32561 | 0.0073646617 | 97.60027 |
| EFC13 | 15254 | 0.20177522 | 99.52738 | 0.00654284 | 97.60682 |
| LFC9 | 12138 | 0.16055772 | 99.68794 | 0.0052063055 | 97.61202 |
| LFC15 | 11986 | 0.1585471 | 99.84649 | 0.0051411085 | 97.617165 |
| EFC12 | 8703 | 0.1151206 | 99.96161 | 0.003732944 | 97.620895 |
| LFC14 | 1547 | 0.02046324 | 99.98207 | 6.635487e-04 | 97.62156 |
| LFC12 | 1345 | 0.017791245 | 99.99986 | 5.769057e-04 | 97.62214 |
| PORTO | 6 | 7.9366155e-05 | 99.99994 | 2.573557e-06 | 97.62214 |
| PORTI | 4 | 5.2910767e-05 | 99.99999 | 1.7157047e-06 | 97.62214 |
| LFC13 | 0 | | | | |
| LFC10 | 0 | | | | |

In 'MEMORY: LOADS VS STORES', Opcode frequencies for 'ldstOther' (2.3778477)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| z377 | 2292541 | 41.353817 | 41.353817 | 0.9833308 | 98.60547 |
| LADRB | 1210940 | 21.843443 | 63.197258 | 0.51940384 | 99.12487 |
| LLKB | 714007 | 12.879558 | 76.07681 | 0.30625627 | 99.43113 |
| GADRB | 337893 | 6.0950556 | 82.17187 | 0.14493114 | 99.57606 |
| BLTC | 274127 | 4.9448175 | 87.116684 | 0.11758025 | 99.693634 |
| BLT | 131402 | 2.3702843 | 89.48697 | 0.05636176 | 99.74999 |
| LINKB | 102080 | 1.8413618 | 91.32833 | 0.04378478 | 99.79378 |
| MISC | 99438 | 1.7937044 | 93.12203 | 0.042651563 | 99.836426 |
| CATCH | 98437 | 1.7756479 | 94.89768 | 0.042222204 | 99.87865 |
| IWDC | 75894 | 1.3690078 | 96.26669 | 0.032552924 | 99.9112 |
| DWDC | 75689 | 1.36531 | 97.632 | 0.032464993 | 99.943665 |
| DESCB | 66047 | 1.1913835 | 98.82339 | 0.028329287 | 99.97199 |
| DESCBS | 25289 | 0.45617356 | 99.279564 | 0.010847113 | 99.98284 |
| MRE | 10248 | 0.18485771 | 99.464424 | 0.0043956356 | 99.987236 |
| MXW | 8686 | 0.1566817 | 99.62111 | 0.0037256525 | 99.99096 |
| ME | 4741 | 0.08552015 | 99.70663 | 0.002033539 | 99.993 |
| MXD | 4722 | 0.08517742 | 99.7918 | 0.0020253892 | 99.99502 |
| ALLOC | 3859 | 0.06961026 | 99.86141 | 0.001655226 | 99.99667 |
| FREE | 3120 | 0.05627987 | 99.917694 | 0.0013382496 | 99.99801 |
| DST | 2277 | 0.041073484 | 99.95877 | 9.766649e-04 | 99.998985 |
| LSTF | 1878 | 0.033876152 | 99.992645 | 8.055233e-04 | 99.999794 |
| BLTL | 189 | 0.0034092612 | 99.996056 | 8.106705e-05 | 99.99988 |
| BITBLT | 156 | 0.002813993 | 99.99887 | 6.691248e-05 | 99.99995 |
| REQUEUE | 19 | 3.4273e-04 | 99.999214 | 8.149597e-06 | 99.999954 |
| NOTIFY | 14 | 2.5253787e-04 | 99.999466 | 6.0049653e-06 | 99.99996 |
| LST | 14 | 2.5253787e-04 | 99.99972 | 6.0049653e-06 | 99.99997 |
| BCAST | 9 | 1.6234577e-04 | 99.99988 | 3.8603354e-06 | 99.99998 |
| STOP | 4 | 7.215368e-05 | 99.99995 | 1.7157047e-06 | 99.99998 |
| STARTIO | 3 | 5.4115257e-05 | 100.0 | 1.2867785e-06 | 99.99998 |
| z174 | 0 | | | | |
| z175 | 0 | | | | |
| BLTCL | 0 | | | | |
| z176 | 0 | | | | |
| z177 | 0 | | | | |
| z271 | 0 | | | | |
| z272 | 0 | | | | |
| z273 | 0 | | | | |
| z274 | 0 | | | | |
| z275 | 0 | | | | |
| z276 | 0 | | | | |
| z277 | 0 | | | | |
| JRAM | 0 | | | | |
| 75 | 0 | | | | |
| 76 | 0 | | | | |
| 77 | 0 | | | | |
| z373 | 0 | | | | |
| WR | 0 | | | | |

| | |
|---|---|
| RR | 0 |
| BRK | 0 |
| NOOP | 0 |

STATISTICS FOR 'ALU INPUTS FOR MEMORY ADDRESS'

Instruction Frequencies by Group: ALU INPUTS FOR MEMORY ADDRESS

| | | | |
|---|---|---|---|
| aiMem2 | 88114273 | 37.794518 | 37.794518 |
| aiAluCbr | 39216633 | 16.821041 | 54.61556 |
| aiAlu | 29062109 | 12.465499 | 67.081055 |
| aiImmed | 26652107 | 11.4317875 | 78.51284 |
| aiMem3Plus | 19432921 | 8.335288 | 86.84813 |
| aiCmplx | 11607437 | 4.9787335 | 91.826866 |
| aiMem2Plus | 10410015 | 4.465128 | 96.29199 |
| aiJump | 4684818 | 2.0094411 | 98.30143 |
| aiAluPlus | 2306343 | 0.98925095 | 99.29068 |
| aiMem3 | 1653718 | 0.7093229 | 100.0 |

OPCODES WITHIN GROUPS OF ALU INPUTS FOR MEMORY ADDRESS

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiMem2' (37.794514)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| LL0 | 20882147 | 23.69894 | 23.69894 | 8.9569 | 8.9569 |
| R0 | 10817909 | 12.277136 | 35.976074 | 4.6400843 | 13.596984 |
| LG0 | 6967303 | 7.9071226 | 43.883198 | 2.9884584 | 16.585442 |
| LL1 | 5605261 | 6.3613544 | 50.244553 | 2.404243 | 18.989685 |
| LL2 | 3781745 | 4.2918644 | 54.536415 | 1.6220894 | 20.611774 |
| LLB | 3430454 | 3.8931875 | 58.429604 | 1.4714115 | 22.083185 |
| PL0 | 3144341 | 3.568481 | 61.998085 | 1.34869 | 23.431875 |
| LGB | 2908696 | 3.3010497 | 65.29913 | 1.2476157 | 24.679491 |
| LL3 | 2860550 | 3.2464094 | 68.54554 | 1.2269647 | 25.906456 |
| SL1 | 2346204 | 2.6626832 | 71.20822 | 1.0063483 | 26.912804 |
| SL0 | 2286276 | 2.5946715 | 73.802895 | 0.98064356 | 27.893448 |
| SLB | 2254568 | 2.5586865 | 76.36158 | 0.9670431 | 28.86049 |
| LG1 | 1653831 | 1.8769161 | 78.238495 | 0.7093714 | 29.569862 |
| LL5 | 1629637 | 1.8494586 | 80.08795 | 0.6989939 | 30.268856 |
| LLDB | 1465776 | 1.6634945 | 81.75145 | 0.6287097 | 30.897566 |
| SLDB | 1419336 | 1.6107903 | 83.36224 | 0.60879035 | 31.506355 |
| SL2 | 1375542 | 1.5610888 | 84.92333 | 0.5900059 | 32.096363 |
| SL3 | 1192021 | 1.3528126 | 86.276146 | 0.5112889 | 32.60765 |
| LL4 | 1166026 | 1.3233111 | 87.59946 | 0.50013905 | 33.107788 |
| SL4 | 959190 | 1.0885751 | 88.688034 | 0.41142168 | 33.51921 |
| PL1 | 928234 | 1.0534434 | 89.74148 | 0.39814386 | 33.917355 |
| PL2 | 834472 | 0.9470339 | 90.688515 | 0.35792687 | 34.27528 |
| LG6 | 780393 | 0.8856602 | 91.57417 | 0.33473096 | 34.610012 |
| LG5 | 764367 | 0.86747246 | 92.44164 | 0.327857 | 34.93787 |
| LL6 | 723409 | 0.8209896 | 93.262634 | 0.31028905 | 35.248158 |
| SGB | 693947 | 0.7875535 | 94.050186 | 0.29765203 | 35.54581 |
| SL5 | 660092 | 0.7491317 | 94.79932 | 0.28313074 | 35.82894 |
| SL6 | 535088 | 0.607266 | 95.406586 | 0.22951322 | 36.058456 |
| LG4 | 534721 | 0.6068495 | 96.013435 | 0.22935581 | 36.28781 |
| LG3 | 531908 | 0.603657 | 96.617096 | 0.22814927 | 36.51596 |
| SG1 | 407335 | 0.46228037 | 97.07938 | 0.17471662 | 36.690678 |
| PL3 | 383044 | 0.4347128 | 97.51409 | 0.16429758 | 36.854977 |
| LG2 | 340142 | 0.38602373 | 97.900116 | 0.14589581 | 37.000874 |
| LG7 | 288892 | 0.32786062 | 98.227974 | 0.123913336 | 37.124786 |
| LL7 | 286525 | 0.32517433 | 98.55315 | 0.122898054 | 37.247684 |
| SL7 | 276920 | 0.31427372 | 98.86742 | 0.11877823 | 37.366463 |
| W0 | 256547 | 0.2911526 | 99.15857 | 0.11003972 | 37.4765 |
| SG0 | 236538 | 0.2684446 | 99.42702 | 0.10145733 | 37.577957 |
| LGDB | 186500 | 0.21165698 | 99.63867 | 0.079994726 | 37.65795 |
| SGDB | 98238 | 0.11148931 | 99.75016 | 0.042136846 | 37.70009 |
| RD0 | 58646 | 0.06655675 | 99.81672 | 0.025154803 | 37.725243 |
| WS0 | 51399 | 0.05833221 | 99.87505 | 0.022046375 | 37.747288 |
| SG3 | 34216 | 0.038831396 | 99.91389 | 0.014676137 | 37.761963 |
| RBL | 24668 | 0.027995465 | 99.94188 | 0.0105807495 | 37.772545 |
| SG2 | 21946 | 0.024906297 | 99.96679 | 0.009413213 | 37.78196 |
| WD0 | 19149 | 0.021732008 | 99.98852 | 0.008213507 | 37.790173 |
| WBL | 10124 | 0.011489625 | 100.00001 | 0.0043424482 | 37.794514 |
| RDBL | 0 | | | | |
| WDBL | 0 | | | | |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiAluCbr' (16.82104)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| JZNEB | 23991607 | 61.177124 | 61.177124 | 10.2906275 | 48.08514 |
| JZEQB | 3086260 | 7.8697734 | 69.0469 | 1.3237777 | 49.408916 |
| JEQB | 2241176 | 5.714861 | 74.76176 | 0.96129894 | 50.370216 |
| JNEB | 2174935 | 5.545951 | 80.30771 | 0.9328865 | 51.303104 |
| JULB | 1931167 | 4.924357 | 85.23206 | 0.82832804 | 52.13143 |
| JUGB | 957275 | 2.4409924 | 87.67306 | 0.41060028 | 52.54203 |
| JNE7 | 534244 | 1.3622893 | 89.03535 | 0.22915123 | 52.771183 |
| JLB | 483964 | 1.2340784 | 90.269424 | 0.20758481 | 52.978767 |
| JULEB | 421291 | 1.0742662 | 91.34369 | 0.18070273 | 53.15947 |
| JNE4 | 411515 | 1.0493379 | 92.39303 | 0.17650955 | 53.33598 |
| JNE5 | 399423 | 1.018504 | 93.41153 | 0.17132297 | 53.5073 |

| | | | | | |
|---|---|---|---|---|---|
| JNF9 | 380865 | 0.97118235 | 94.38271 | 0.16336296 | 53.670666 |
| JEQ5 | 344231 | 0.87776794 | 95.26048 | 0.14764967 | 53.818314 |
| JGB | 337887 | 0.86159115 | 96.12207 | 0.14492856 | 53.96324 |
| JUGEB | 277920 | 0.7086789 | 96.83075 | 0.119207155 | 54.082447 |
| JNE2 | 195717 | 0.4990663 | 97.32982 | 0.083948135 | 54.166397 |
| JEQ7 | 193484 | 0.49337234 | 97.82319 | 0.08299035 | 54.249386 |
| JEQ4 | 192166 | 0.49001145 | 98.3132 | 0.08242502 | 54.33181 |
| JLEB | 137744 | 0.35123873 | 98.664444 | 0.059082007 | 54.390892 |
| JEQ3 | 110792 | 0.28251278 | 98.94696 | 0.047521586 | 54.43841 |
| JGEB | 100623 | 0.25658247 | 99.203545 | 0.043159838 | 54.48157 |
| JNE8 | 90359 | 0.23040991 | 99.43395 | 0.03875734 | 54.52033 |
| JNE3 | 82819 | 0.21118336 | 99.645134 | 0.035523233 | 54.55585 |
| JNE6 | 63357 | 0.16155646 | 99.806694 | 0.027175474 | 54.583027 |
| JEQ8 | 33459 | 0.08531839 | 99.89201 | 0.0143514395 | 54.597378 |
| JEQ6 | 23846 | 0.060805836 | 99.95282 | 0.010228173 | 54.607605 |
| JEQ9 | 17627 | 0.044947767 | 99.997765 | 0.0075606813 | 54.615166 |
| JEQ2 | 880 | 0.0022439458 | 100.00001 | 3.7745502e-04 | 54.615543 |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiAlu' (12.465498)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| ADD | 11516841 | 39.628376 | 39.628376 | 4.939874 | 59.555416 |
| PUSH | 8182853 | 28.156433 | 67.784805 | 3.5098395 | 63.065254 |
| INC | 2954754 | 10.167032 | 77.951836 | 1.2673712 | 64.33263 |
| SUB | 1504900 | 5.1782203 | 83.13006 | 0.64549093 | 64.97812 |
| LADRB | 1210940 | 4.166732 | 87.29679 | 0.51940384 | 65.49752 |
| SHIFT | 1073320 | 3.693194 | 90.98998 | 0.46037502 | 65.95789 |
| AND | 603497 | 2.076577 | 93.06656 | 0.25885563 | 66.21675 |
| DBL | 341387 | 1.1746808 | 94.24124 | 0.1464298 | 66.36318 |
| GADRB | 337893 | 1.1626582 | 95.4039 | 0.14493114 | 66.50811 |
| EXCH | 332629 | 1.1445453 | 96.54845 | 0.14267326 | 66.65078 |
| DUP | 217300 | 0.74770904 | 97.29616 | 0.09320565 | 66.74399 |
| POP | 198773 | 0.6839594 | 97.98012 | 0.08525894 | 66.82925 |
| CATCH | 98437 | 0.3387125 | 98.31883 | 0.042222204 | 66.87147 |
| DADD | 95985 | 0.33027542 | 98.64911 | 0.041170478 | 66.912636 |
| IWDC | 75894 | 0.26114419 | 98.910255 | 0.032552924 | 66.94519 |
| DWDC | 75689 | 0.26043878 | 99.17069 | 0.032464993 | 66.97765 |
| DUCOMP | 65284 | 0.22463615 | 99.39533 | 0.028002014 | 67.00565 |
| DSUB | 63112 | 0.21716249 | 99.612495 | 0.027070384 | 67.03272 |
| OR | 45384 | 0.15616212 | 99.768654 | 0.019466383 | 67.052185 |
| XOR | 24146 | 0.083084126 | 99.85174 | 0.010356851 | 67.06254 |
| NEG | 23119 | 0.07955032 | 99.93129 | 0.009916344 | 67.07246 |
| DCOMP | 19972 | 0.06872178 | 100.000015 | 0.008566513 | 67.081024 |
| LP | 0 | | | | |
| NILCK | 0 | | | | |
| ADD01 | 0 | | | | |
| NILCKL | 0 | | | | |
| BNDCK | 0 | | | | |
| NOOP | 0 | | | | |
| WR | 0 | | | | |
| RR | 0 | | | | |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiImmed' (11.431786)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| LIW | 12610361 | 47.314686 | 47.314686 | 5.4089136 | 72.48994 |
| LIB | 3717147 | 13.946917 | 61.261604 | 1.5943816 | 74.08432 |
| LI0 | 3594730 | 13.487601 | 74.74921 | 1.5418737 | 75.62619 |
| LI1 | 2609636 | 9.791481 | 84.54069 | 1.1193411 | 76.74553 |
| LI2 | 1471740 | 5.52204 | 90.06273 | 0.6312678 | 77.3768 |
| LI3 | 1175431 | 4.410274 | 94.473 | 0.5041731 | 77.880974 |
| LIN1 | 605516 | 2.2719252 | 96.74493 | 0.25972164 | 78.14069 |
| LI5 | 435327 | 1.633368 | 98.378296 | 0.18672313 | 78.327415 |
| LI4 | 295750 | 1.1096684 | 99.48796 | 0.12685491 | 78.45427 |
| LI6 | 123858 | 0.4647212 | 99.95268 | 0.05312593 | 78.50739 |
| LINI | 12611 | 0.047317085 | 100.0 | 0.005409188 | 78.5128 |
| LINB | 0 | | | | |
| LCO | 0 | | | | |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiMem3Plus' (8.335288)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RF | 17463158 | 89.86379 | 89.86379 | 7.4904056 | 86.003204 |
| WF | 1128552 | 5.8074236 | 95.67122 | 0.48406549 | 86.48727 |
| WSF | 537936 | 2.7681687 | 98.439384 | 0.23073483 | 86.718 |
| RFC | 303131 | 1.559884 | 99.99927 | 0.13002081 | 86.84802 |
| WFS | 84 | 4.3225617e-04 | 99.9997 | 3.6029797e-05 | 86.84806 |
| RFS | 60 | 3.0875442e-04 | 100.00001 | 2.5735569e-05 | 86.84808 |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiCmplx' (4.978733)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RET | 4139512 | 35.662586 | 35.662586 | 1.7755449 | 88.62363 |
| z377 | 2292541 | 19.750622 | 55.413208 | 0.9833308 | 89.60696 |
| MUL | 586483 | 5.0526485 | 60.46586 | 0.25155787 | 89.85851 |
| JIW | 555268 | 4.783726 | 65.24959 | 0.23816895 | 90.09668 |
| EFCB | 342170 | 2.9478514 | 68.19744 | 0.14676566 | 90.24345 |
| SFC | 289729 | 2.4960635 | 70.693504 | 0.12427235 | 90.36772 |
| BLTC | 274127 | 2.3616498 | 73.05515 | 0.11758025 | 90.4853 |
| EFC1 | 269551 | 2.3222268 | 75.37738 | 0.115617466 | 90.600914 |
| LFCB | 241217 | 2.0781245 | 77.455505 | 0.10346428 | 90.70438 |
| EFC4 | 219011 | 1.8868161 | 79.34232 | 0.09393954 | 90.79832 |
| EFC5 | 191006 | 1.6455484 | 80.98787 | 0.08192747 | 90.88024 |
| LFC1 | 174262 | 1.501296 | 82.48917 | 0.07474553 | 90.95499 |
| EFC2 | 151590 | 1.305973 | 83.795135 | 0.065020914 | 91.020004 |
| LFC7 | 142077 | 1.2240169 | 85.01915 | 0.060940542 | 91.08095 |
| LFC2 | 136215 | 1.1735148 | 86.192665 | 0.05842617 | 91.13937 |
| LFC4 | 132151 | 1.1385028 | 87.33117 | 0.05668302 | 91.19606 |
| BLT | 131402 | 1.13205 | 88.46322 | 0.05636176 | 91.25242 |
| LFC3 | 130268 | 1.1222805 | 89.5855 | 0.05587535 | 91.3083 |
| LFC6 | 116650 | 1.0049592 | 90.59046 | 0.050034232 | 91.35833 |
| EFC3 | 107524 | 0.92633715 | 91.5168 | 0.046119857 | 91.40445 |
| EFC15 | 107069 | 0.92241726 | 92.43922 | 0.045924692 | 91.45037 |
| EFC0 | 103615 | 0.8926605 | 93.33188 | 0.044443183 | 91.49481 |
| MISC | 99438 | 0.85667496 | 94.18855 | 0.042651563 | 91.53746 |
| EFC11 | 94752 | 0.8163042 | 95.00486 | 0.04064161 | 91.5781 |
| EFC7 | 90955 | 0.78359246 | 95.78845 | 0.039012976 | 91.61712 |
| EFC9 | 58270 | 0.50200577 | 96.29046 | 0.024993525 | 91.64211 |
| DIV | 49019 | 0.42230682 | 96.71277 | 0.021025531 | 91.66314 |
| KFCB | 43245 | 0.37256286 | 97.085335 | 0.018548912 | 91.68169 |
| EFC14 | 43044 | 0.37083123 | 97.45617 | 0.018462696 | 91.70015 |
| EFC6 | 33750 | 0.29076185 | 97.74693 | 0.014476256 | 91.71462 |
| LFC5 | 31531 | 0.27164483 | 98.01858 | 0.01352447 | 91.72815 |
| LFC11 | 31327 | 0.26988733 | 98.28847 | 0.013436971 | 91.741585 |
| LFC8 | 30067 | 0.2590322 | 98.5475 | 0.0128965235 | 91.75448 |
| EFC10 | 21050 | 0.18134926 | 98.72885 | 0.009028894 | 91.763504 |
| EFC8 | 20137 | 0.17348361 | 98.902336 | 0.008637286 | 91.77214 |
| LDIV | 19322 | 0.16646224 | 99.0688 | 0.008287711 | 91.780426 |
| LFC16 | 17170 | 0.14792241 | 99.21672 | 0.0073646617 | 91.78779 |
| EFC13 | 15254 | 0.13141575 | 99.34814 | 0.00654284 | 91.794334 |
| LFC9 | 12138 | 0.10457089 | 99.452705 | 0.0052063055 | 91.79954 |
| LFC15 | 11986 | 0.103261375 | 99.55597 | 0.0051411085 | 91.80468 |
| MRE | 10248 | 0.08828822 | 99.64426 | 0.0043956356 | 91.809074 |
| EFC12 | 8703 | 0.07497779 | 99.71923 | 0.003732944 | 91.812805 |
| MXW | 8686 | 0.07483133 | 99.79406 | 0.0037256525 | 91.81653 |
| ME | 4741 | 0.040844502 | 99.83491 | 0.002033539 | 91.818565 |
| MXD | 4722 | 0.040680814 | 99.87559 | 0.0020253892 | 91.82059 |
| ALLOC | 3859 | 0.033245924 | 99.90884 | 0.001655226 | 91.82224 |
| FREE | 3120 | 0.02687932 | 99.935715 | 0.0013382496 | 91.82358 |
| DST | 2277 | 0.019616735 | 99.95533 | 9.766649e-04 | 91.824554 |
| LSTF | 1878 | 0.016179281 | 99.97151 | 8.055233e-04 | 91.82536 |
| LFC14 | 1547 | 0.013327663 | 99.98484 | 6.635487e-04 | 91.82603 |
| LFC12 | 1345 | 0.011587398 | 99.99643 | 5.769057e-04 | 91.82661 |
| BLTL | 189 | 0.0016282664 | 99.998055 | 8.106705e-05 | 91.82669 |
| BITBLT | 156 | 0.001343966 | 99.9994 | 6.691248e-05 | 91.82676 |
| REQUEUE | 19 | 1.6368816e-04 | 99.99956 | 8.149597e-06 | 91.82677 |
| NOTIFY | 14 | 1.2061233e-04 | 99.99968 | 6.0049653e-06 | 91.826775 |
| LST | 14 | 1.2061233e-04 | 99.9998 | 6.0049653e-06 | 91.82678 |
| BCAST | 9 | 7.753649e-05 | 99.99988 | 3.8603354e-06 | 91.82679 |
| PORTO | 6 | 5.169099e-05 | 99.99993 | 2.573557e-06 | 91.82679 |

| | | | | | |
|---|---|---|---|---|---|
| PORTI | 4 | 3.4460666e-05 | 99.99997 | 1.7157047e-06 | 91.82679 |
| STOP | 4 | 3.4460666e-05 | 100.00001 | 1.7157047e-06 | 91.82679 |
| STARTIO | 3 | 2.5845494e-05 | 100.00003 | 1.2867785e-06 | 91.82679 |
| JIB | 0 | | | | |
| 75 | 0 | | | | |
| 76 | 0 | | | | |
| 77 | 0 | | | | |
| z174 | 0 | | | | |
| z271 | 0 | | | | |
| z272 | 0 | | | | |
| BLTCL | 0 | | | | |
| z273 | 0 | | | | |
| LFC10 | 0 | | | | |
| z274 | 0 | | | | |
| z275 | 0 | | | | |
| LFC13 | 0 | | | | |
| z276 | 0 | | | | |
| JRAM | 0 | | | | |
| z277 | 0 | | | | |
| z175 | 0 | | | | |
| z176 | 0 | | | | |
| z373 | 0 | | | | |
| BRK | 0 | | | | |
| z177 | 0 | | | | |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiMem2Plus' (4.465128)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RXLP | 3133505 | 30.10087 | 30.10087 | 1.3440423 | 93.17083 |
| RILP | 2730841 | 26.232824 | 56.333694 | 1.1713291 | 94.342155 |
| WXLP | 1600935 | 15.378796 | 71.712494 | 0.6866829 | 95.02884 |
| WILP | 1053146 | 10.116661 | 81.829155 | 0.45172186 | 95.48056 |
| LLKB | 714007 | 6.858847 | 88.688 | 0.30625627 | 95.78682 |
| RIGP | 645873 | 6.2043424 | 94.89235 | 0.2770318 | 96.06385 |
| RILO | 440372 | 4.2302723 | 99.12262 | 0.18888706 | 96.25274 |
| DESCB | 66047 | 0.63445635 | 99.75707 | 0.028329287 | 96.28107 |
| DESCBS | 25289 | 0.24292953 | 100.0 | 0.010847113 | 96.291916 |
| WXGPL | 0 | | | | |
| RILPL | 0 | | | | |
| WILPL | 0 | | | | |
| RIGPL | 0 | | | | |
| WIGPL | 0 | | | | |
| RFL | 0 | | | | |
| WFL | 0 | | | | |
| RFSL | 0 | | | | |
| WFSL | 0 | | | | |
| RXLPL | 0 | | | | |
| WXLPL | 0 | | | | |
| RXGPL | 0 | | | | |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiJump' (2.009441)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| JB | 2644455 | 56.44734 | 56.44734 | 1.1342759 | 97.42619 |
| JW | 1149992 | 24.547207 | 80.994545 | 0.49326162 | 97.91946 |
| J2 | 258409 | 5.515881 | 86.51043 | 0.11083838 | 98.0303 |
| J3 | 234348 | 5.0022864 | 91.51272 | 0.10051798 | 98.13081 |
| J4 | 99520 | 2.1243088 | 93.637024 | 0.04268673 | 98.1735 |
| J6 | 93153 | 1.9884016 | 95.62543 | 0.03995576 | 98.213455 |
| J5 | 80986 | 1.7286904 | 97.35412 | 0.034737015 | 98.24819 |
| J7 | 57540 | 1.2282227 | 98.582344 | 0.02468041 | 98.27287 |
| J8 | 48608 | 1.0375643 | 99.61991 | 0.020849242 | 98.293724 |
| J9 | 17807 | 0.38010015 | 100.00001 | 0.0076378875 | 98.30136 |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiAluPlus' (0.98925085)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| RSTR | 1350516 | 58.5566 | 58.5566 | 0.5792716 | 98.88063 |
| WSTR | 853747 | 37.01735 | 95.573944 | 0.3661944 | 99.246826 |
| LINKB | 102080 | 4.4260545 | 100.0 | 0.04378478 | 99.29061 |
| WSTRL | 0 | | | | |
| RSTRL | 0 | | | | |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiMem3' (0.7093229)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RB | 460332 | 27.836185 | 27.836185 | 0.19744844 | 99.48806 |
| R1 | 405708 | 24.533083 | 52.36927 | 0.17401876 | 99.66208 |
| WB | 392025 | 23.705675 | 76.07494 | 0.16814978 | 99.83023 |
| WSB | 150648 | 9.109655 | 85.1846 | 0.064616866 | 99.894844 |
| WSDB | 66335 | 4.0112643 | 89.19586 | 0.028452816 | 99.923294 |
| R3 | 49757 | 3.008796 | 92.20466 | 0.021342077 | 99.94463 |
| R4 | 29708 | 1.7964369 | 94.0011 | 0.012742537 | 99.957375 |
| W2 | 23821 | 1.4404511 | 95.44155 | 0.01021745 | 99.96759 |
| RDB | 22649 | 1.3695805 | 96.811134 | 0.009714747 | 99.9773 |
| W1 | 21213 | 1.2827458 | 98.09388 | 0.00909881 | 99.986404 |
| R2 | 20836 | 1.2599487 | 99.35383 | 0.008937105 | 99.99534 |
| WDB | 10686 | 0.64618025 | 100.00001 | 0.0045835047 | 99.99992 |

PAIR STATISTICS BY GROUP: PRINC OPS
116570187 total pairs

| | | | |
|---|---|---|---|
| <R/W, CondJumps> | 12094187, | 10.375026 | 10.375026 |
| <Ld/Store, Ld/Store> | 11331136, | 9.720441 | 20.095467 |
| <CondJumps,Ld/Store> | 10602311, | 9.095217 | 29.190683 |
| <Ld/Store, R/W> | 9662261, | 8.288793 | 37.479477 |
| <Ld/Store, ALU Ops> | 6334413, | 5.433991 | 42.913467 |
| <Ld Immed, R/W> | 5953384, | 5.1071243 | 48.02059 |
| <CondJumps,Ld Immed> | 5705539, | 4.89451 | 52.9151 |
| <R/W, Ld/Store> | 5269357, | 4.52033 | 57.43543 |
| <ALU Ops, R/W> | 4490571, | 3.8522468 | 61.287674 |
| <Ld Immed, CondJumps> | 3579173, | 3.0704017 | 64.35808 |
| <Ld/Store, Ld Immed> | 3429178, | 2.941728 | 67.299805 |
| <Ld/Store, CondJumps> | 3421639, | 2.935261 | 70.23507 |
| <ALU Ops, Ld/Store> | 3032073, | 2.6010706 | 72.83614 |
| <Xfers, Ld/Store> | 2374374, | 2.0368624 | 74.87301 |
| <CondJumps,Stack Ops> | 2119453, | 1.8181777 | 76.691185 |
| <Ld/Store, Xfers> | 1910516, | 1.6389406 | 78.330124 |
| <Ld Immed, ALU Ops> | 1780149, | 1.5271049 | 79.85723 |
| <Stack Ops,Ld/Store> | 1750243, | 1.50145 | 81.35868 |
| <Jumps, Ld/Store> | 1727898, | 1.4822813 | 82.840965 |
| <Misc, Ld/Store> | 1674020, | 1.4360619 | 84.27702 |
| <R/W, Ld Immed> | 1552863, | 1.3321271 | 85.60915 |
| <Stack Ops,Ld Immed> | 1451292, | 1.2449942 | 86.85415 |
| <R/W, R/W> | 1412905, | 1.2120638 | 88.066216 |
| <Ld/Store, Stack Ops> | 1298515, | 1.113934 | 89.18015 |
| <R/W, Xfers> | 1118023, | 0.9590986 | 90.13925 |
| <Ld Immed, Ld/Store> | 899517, | 0.7716527 | 90.910904 |
| <Ld/Store, Jumps> | 707320, | 0.60677605 | 91.51768 |
| <Ld Immed, Jumps> | 642528, | 0.55119414 | 92.06887 |
| <ALU Ops, Ld Immed> | 622587, | 0.5340877 | 92.60296 |
| <Misc, ALU Ops> | 488801, | 0.41931906 | 93.02228 |
| <Stack Ops,R/W> | 470134, | 0.40330553 | 93.42558 |
| <R/W, ALU Ops> | 465824, | 0.39960815 | 93.82519 |
| <Xfers, R/W> | 453338, | 0.38889706 | 94.21409 |
| <ALU Ops, Jumps> | 441790, | 0.37899055 | 94.59308 |
| <R/W, Stack Ops> | 417545, | 0.35819194 | 94.95127 |
| <Jumps, Xfers> | 400924, | 0.34393358 | 95.295204 |
| <R/W, Jumps> | 376916, | 0.32333825 | 95.618546 |
| <CondJumps,R/W> | 339155, | 0.2909449 | 95.90949 |
| <CondJumps,Jumps> | 318615, | 0.2733246 | 96.182816 |
| <Xfers, Xfers> | 312052, | 0.26769452 | 96.45051 |
| <Stack Ops,CondJumps> | 300832, | 0.25806942 | 96.70858 |
| <ALU Ops, Stack Ops> | 253790, | 0.21771433 | 96.92629 |
| <CondJumps,Xfers> | 250276, | 0.21469984 | 97.14099 |
| <Ld Immed, Xfers> | 243934, | 0.20925932 | 97.35025 |
| <ALU Ops, CondJumps> | 239980, | 0.20586739 | 97.556114 |
| <ALU Ops, ALU Ops> | 215343, | 0.1847325 | 97.740845 |
| <Stack Ops,ALU Ops> | 196644, | 0.1686915 | 97.90954 |
| <Ld Immed, Ld Immed> | 193138, | 0.16568388 | 98.075226 |
| <Xfers, Jumps> | 186734, | 0.1601902 | 98.23541 |
| <Stack Ops,Stack Ops> | 181309, | 0.15553634 | 98.390945 |
| <Xfers, CondJumps> | 165192, | 0.14171034 | 98.53265 |
| <Jumps, Ld Immed> | 136643, | 0.11721951 | 98.64987 |
| <Misc, Xfers> | 125152, | 0.10736194 | 98.75723 |
| <Misc, Stack Ops> | 124823, | 0.1070797 | 98.86431 |
| <Xfers, Ld Immed> | 124000, | 0.10637368 | 98.97069 |
| <Misc, Ld Immed> | 119239, | 0.10228945 | 99.072975 |
| <Ld/Store, Misc> | 117422, | 0.10073073 | 99.173706 |
| <Stack Ops,Jumps> | 113508, | 0.097373095 | 99.27108 |
| <ALU Ops, Xfers> | 109547, | 0.09397514 | 99.36506 |
| <R/W, Misc> | 94548, | 0.08110822 | 99.44617 |
| <Misc, R/W> | 82095, | 0.07042539 | 99.516594 |
| <Xfers, Misc> | 81045, | 0.06952464 | 99.58612 |
| <ALU Ops, Misc> | 72890, | 0.06252885 | 99.64865 |
| <Jumps, Stack Ops> | 58104, | 0.04984465 | 99.698494 |
| <Misc, Jumps> | 57116, | 0.048997087 | 99.74749 |
| <Xfers, Stack Ops> | 54444, | 0.046704912 | 99.7942 |
| <Stack Ops,Xfers> | 47195, | 0.04048634 | 99.83469 |
| <Misc, CondJumps> | 33681, | 0.028893323 | 99.86358 |
| <CondJumps,Misc> | 29113, | 0.024974656 | 99.88855 |
| <Jumps, ALU Ops> | 18019, | 0.015457642 | 99.90401 |
| <Jumps, Jumps> | 15007, | 0.01287379 | 99.91688 |
| <Misc, Misc> | 14959, | 0.012832612 | 99.92971 |

```
<Jumps,     CondJumps>     14656, 0.012572683    99.94228
<Ld Immed,  Stack Ops>     13819, 0.0118546605   99.95414
<Ld Immed,  Misc>          11512, 0.009875595    99.96401
<R/W,       Processes>     10298, 0.008834163    99.97285
<Jumps,     R/W>            5957, 0.005110226    99.97796
<Processes,Misc>            5155, 0.0044222283   99.98238
<ALU Ops,   Processes>      4698, 0.00403019     99.98641
<Xfers,     ALU Ops>        3739, 0.00320751     99.98962
<Jumps,     Misc>           3255, 0.0027923093   99.99241
<Processes,CondJumps>       2831, 0.0024285798   99.994835
<Processes,Ld/Store>        2500, 0.002144631    99.99698
<Processes,Xfers>           1368, 0.0011735418   99.99815
<Processes,R/W>              583, 5.001279e-04   99.99866
<Stack Ops,Misc>             569, 4.8811793e-04  99.999146
<Processes,Ld Immed>         474, 4.0662198e-04  99.99955
<Processes,ALU Ops>          324, 2.7794414e-04  99.999825
<Processes,Stack Ops>        107, 9.179019e-05   99.999916
<Processes,Jumps>             89, 7.634885e-05   99.99999
<Misc,      Processes>        10, 8.578524e-06   100.0
<Ld/Store,  Processes>         2, 1.7157047e-06  100.0
```

PAIR STATISTICS BY GROUP: LOCALS VS GLOBALS GROUP
116570187 total pairs

| | | | |
|---|---|---|---|
| <addresses, CondJumpsInLG> | 11517217, 9.880071 | 9.880071 |
| <CondJumpsInLG,locals> | 9970071, 8.552849 | 18.432919 |
| <locals, addresses> | 6736145, 5.7786174 | 24.211536 |
| <locals, locals> | 6065564, 5.203358 | 29.414894 |
| <LdImmedInLG, addresses> | 5844697, 5.013887 | 34.42878 |
| <CondJumpsInLG,LdImmedInLG> | 5705539, 4.89451 | 39.323288 |
| <locals, globals> | 4505696, 3.8652215 | 43.18851 |
| <AluInLG, addresses> | 4083946, 3.5034225 | 46.691933 |
| <globals, AluInLG> | 4019917, 3.448495 | 50.140427 |
| <LdImmedInLG, CondJumpsInLG> | 3579173, 3.0704017 | 53.210827 |
| <locals, LdImmedInLG> | 3256209, 2.7933464 | 56.004173 |
| <other, locals> | 2987531, 2.5628605 | 58.56703 |
| <locals, CondJumpsInLG> | 2617183, 2.2451565 | 60.812187 |
| <AluInLG, locals> | 2467549, 2.1167927 | 62.928978 |
| <locals, AluInLG> | 2377835, 2.0398312 | 64.96881 |
| <xfersInLG, locals> | 2224702, 1.9084656 | 66.87727 |
| <addresses, locals> | 2202388, 1.8893236 | 68.766594 |
| <CondJumpsInLG,other> | 2148566, 1.8431521 | 70.60975 |
| <localsIndir, locals> | 1886785, 1.6185827 | 72.22833 |
| <LdImmedInLG, AluInLG> | 1780149, 1.5271049 | 73.75544 |
| <locals, xfersInLG> | 1703239, 1.4611275 | 75.21657 |
| <other, LdImmedInLG> | 1571005, 1.3476902 | 76.564255 |
| <JumpsInLG, locals> | 1507560, 1.2932638 | 77.85752 |
| <globals, localsIndir> | 1350868, 1.1588452 | 79.016365 |
| <addresses, LdImmedInLG> | 1259516, 1.0804787 | 80.09685 |
| <locals, localsIndir> | 1239665, 1.0634495 | 81.16029 |
| <locals, other> | 1220796, 1.0472627 | 82.20756 |
| <LdImmedInLG, locals> | 893554, 0.7665373 | 82.9741 |
| <globals, CondJumpsInLG> | 819533, 0.70303826 | 83.67714 |
| <CondJumpsInLG,globals> | 788024, 0.6760082 | 84.35315 |
| <globals, locals> | 740263, 0.6350363 | 84.98818 |
| <other, AluInLG> | 685769, 0.58828855 | 85.57647 |
| <LdImmedInLG, JumpsInLG> | 642528, 0.55119414 | 86.12766 |
| <locals, JumpsInLG> | 642058, 0.5507909 | 86.67845 |
| <AluInLG, globals> | 623648, 0.5349979 | 87.21345 |
| <AluInLG, LdImmedInLG> | 622587, 0.5340877 | 87.747536 |
| <addresses, xfersInLG> | 533934, 0.45803652 | 88.205574 |
| <addresses, globals> | 509865, 0.43738885 | 88.64296 |
| <globals, globals> | 507685, 0.43551874 | 89.078476 |
| <other, globals> | 491031, 0.42123208 | 89.49971 |
| <addresses, addresses> | 450994, 0.38688623 | 89.8866 |
| <localsIndir, localsIndir> | 443243, 0.38023705 | 90.26683 |
| <addresses, localsIndir> | 442625, 0.37970686 | 90.64654 |
| <AluInLG, JumpsInLG> | 441790, 0.37899055 | 91.02553 |
| <other, localsIndir> | 429873, 0.36876752 | 91.394295 |
| <localsIndir, CondJumpsInLG> | 428161, 0.3672989 | 91.7616 |
| <localsIndir, globals> | 425974, 0.36542277 | 92.12702 |
| <JumpsInLG, xfersInLG> | 391501, 0.33585002 | 92.462875 |
| <AluInLG, localsIndir> | 346165, 0.29695845 | 92.759834 |
| <other, CondJumpsInLG> | 337344, 0.28939133 | 93.049225 |
| <AluInLG, other> | 331378, 0.2842734 | 93.333496 |
| <other, other> | 326932, 0.28045938 | 93.61395 |
| <CondJumpsInLG,JumpsInLG> | 318615, 0.2733246 | 93.887276 |
| <addresses, other> | 316260, 0.27130437 | 94.15858 |
| <localsIndir, xfersInLG> | 312432, 0.2680205 | 94.4266 |
| <xfersInLG, xfersInLG> | 306705, 0.2631076 | 94.689705 |
| <globals, other> | 284720, 0.2442477 | 94.93395 |
| <globals, LdImmedInLG> | 274827, 0.23576097 | 95.169716 |
| <localsIndir, addresses> | 241158, 0.20687795 | 95.376595 |
| <AluInLG, CondJumpsInLG> | 239980, 0.20586739 | 95.58246 |
| <addresses, JumpsInLG> | 232333, 0.19930742 | 95.78177 |
| <locals, globalsIndir> | 230502, 0.19773666 | 95.97951 |
| <LdImmedInLG, xfersInLG> | 229615, 0.19697576 | 96.17648 |
| <xfersInLG, globals> | 227175, 0.19488258 | 96.37137 |
| <localsIndir, AluInLG> | 224987, 0.19300562 | 96.56438 |
| <JumpsInLG, globals> | 222155, 0.19057618 | 96.75495 |
| <CondJumpsInLG,xfersInLG> | 222130, 0.19055473 | 96.9455 |
| <AluInLG, AluInLG> | 215343, 0.1847325 | 97.13023 |
| <localsIndir, LdImmedInLG> | 193598, 0.1660785 | 97.29631 |
| <LdImmedInLG, LdImmedInLG> | 193138, 0.16568388 | 97.462 |
| <xfersInLG, JumpsInLG> | 186593, 0.16006923 | 97.62207 |
| <CondJumpsInLG,localsIndir> | 179189, 0.1537177 | 97.77579 |

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<globals,       addresses>       171548, 0.14716284    97.92295
<other,         JumpsInLG>       170713, 0.14644654    98.0694
<xfersInLG,     CondJumpsInLG>   163860, 0.14056768    98.20996
<other,         xfersInLG>       162290, 0.13922085    98.34918
<globals,       xfersInLG>       153527, 0.1317035     98.48089
<localsIndir,   JumpsInLG>       143927, 0.12346811    98.604355
<JumpsInLG,     LdImmedInLG>     136643, 0.11721951    98.72157
<globalsIndir,  CondJumpsInLG>   135064, 0.11586496    98.83744
<xfersInLG,     other>           133818, 0.11479608    98.95224
<addresses,     AluInLG>         133784, 0.11476692    99.06701
<xfersInLG,     LdImmedInLG>     121433, 0.104171574   99.17118
<localsIndir,   other>           118189, 0.101388705   99.27257
<AluInLG,       xfersInLG>       106431, 0.09130209    99.36387
<globalsIndir,  locals>           96939, 0.08315934    99.44703
<LdImmedInLG,   globals>          90058, 0.077256465   99.524284
<other,         addresses>        67771, 0.058137512   99.58242
<globals,       JumpsInLG>        65999, 0.056617393   99.63904
<JumpsInLG,     other>            61359, 0.052636962   99.69167
<localsIndir,   globalsIndir>     52004, 0.04461175    99.73628
<globalsIndir,  AluInLG>          43979, 0.037727487   99.77401
<globalsIndir,  xfersInLG>        40148, 0.034441054   99.80845
<LdImmedInLG,   localsIndir>      38493, 0.033021307   99.84147
<CondJumpsInLG,addresses>         28146, 0.024145112   99.865616
<LdImmedInLG,   other>            25331, 0.021730258   99.887344
<JumpsInLG,     AluInLG>          18019, 0.015457642   99.9028
<xfersInLG,     localsIndir>      15342, 0.013161169   99.91596
<JumpsInLG,     JumpsInLG>        15007, 0.01287379    99.92883
<other,         globalsIndir>     14794, 0.012691067   99.94152
<JumpsInLG,     CondJumpsInLG>    14656, 0.012572683   99.954094
<JumpsInLG,     addresses>        10356, 0.008883917   99.962975
<xfersInLG,     globalsIndir>     10166, 0.008720926   99.971695
<xfersInLG,     addresses>         4678, 0.0040130334  99.97571
<AluInLG,       globalsIndir>      4452, 0.0038191586  99.97953
<CondJumpsInLG,globalsIndir>       4182, 0.003587538   99.983116
<globalsIndir,  globals>           3691, 0.0031663325  99.98628
<xfersInLG,     AluInLG>           3474, 0.0029801788  99.989265
<globals,       globalsIndir>      2977, 0.0025538263  99.99182
<addresses,     globalsIndir>      2811, 0.002411423   99.99423
<JumpsInLG,     localsIndir>       2580, 0.002213259   99.996445
<globalsIndir,  addresses>         2185, 0.0018744074  99.99832
<JumpsInLG,     globalsIndir>       627, 5.3787346e-04 99.99886
<globalsIndir,  LdImmedInLG>        458, 3.9289637e-04 99.99925
<LdImmedInLG,   globalsIndir>       418, 3.5858226e-04 99.99961
<globalsIndir,  localsIndir>        298, 2.5564e-04    99.99987
<globalsIndir,  JumpsInLG>           60, 5.1471138e-05 99.99992
<globalsIndir,  globalsIndir>        41, 3.517195e-05  99.99996
<globalsIndir,  other>               36, 3.0882683e-05 99.99999
```

PAIR STATISTICS BY GROUP: MEMORY: LOADS VS STORES
116570187 total pairs

| | | | | |
|---|---|---|---|---|
| <loads, | ldstOtherJumps> | 15648940, | 13.424479 | 13.424479 |
| <loads, | loads> | 14945206, | 12.820779 | 26.245258 |
| <ldstOtherJumps, | loads> | 11746810, | 10.077028 | 36.32229 |
| <stores, | loads> | 7082651, | 6.0758686 | 42.398155 |
| <loads, | ldstOtherStackAlu> | 6905704, | 5.924074 | 48.322227 |
| <ldstOtherImmed, | loads> | 5945344, | 5.1002274 | 53.422455 |
| <ldstOtherStackAlu, | loads> | 5850995, | 5.0192895 | 58.441746 |
| <ldstOtherJumps, | ldstOtherImmed> | 5842182, | 5.0117292 | 63.453476 |
| <ldstOtherImmed, | ldstOtherJumps> | 4221701, | 3.6215956 | 67.07507 |
| <loads, | stores> | 3930972, | 3.3721936 | 70.447266 |
| <ldstOtherStackAlu, | stores> | 3762038, | 3.227273 | 73.67454 |
| <loads, | ldstOtherImmed> | 3328861, | 2.855671 | 76.53021 |
| <ldstOtherJumps, | ldstOtherStackAlu> | 2195576, | 1.88348 | 78.41369 |
| <loads, | ldstOtherXfers> | 2082669, | 1.7866224 | 80.20031 |
| <ldstOtherStackAlu, | ldstOtherImmed> | 2073879, | 1.7790818 | 81.97939 |
| <ldstOtherXfers, | stores> | 1828945, | 1.5689647 | 83.548355 |
| <ldstOtherImmed, | ldstOtherStackAlu> | 1793968, | 1.5389596 | 85.08732 |
| <stores, | ldstOtherImmed> | 1551322, | 1.3308051 | 86.41812 |
| <stores, | ldstOtherStackAlu> | 1541986, | 1.3227962 | 87.74092 |
| <ldstOther, | loads> | 1412000, | 1.2112875 | 88.95221 |
| <ldstOtherStackAlu, | ldstOtherJumps> | 1096110, | 0.94030056 | 89.89251 |
| <stores, | stores> | 1059100, | 0.9085513 | 90.80106 |
| <ldstOther, | stores> | 1030665, | 0.8841583 | 91.68522 |
| <stores, | ldstOtherJumps> | 935308, | 0.80235615 | 92.48757 |
| <ldstOtherStackAlu, | ldstOtherStackAlu> | 847086, | 0.72667465 | 93.21425 |
| <ldstOtherImmed, | stores> | 823462, | 0.7064088 | 93.920654 |
| <ldstOtherJumps, | stores> | 770910, | 0.6613269 | 94.58198 |
| <ldstOther, | ldstOtherStackAlu> | 666933, | 0.57212996 | 95.154106 |
| <ldstOtherJumps, | ldstOtherXfers> | 613631, | 0.52640476 | 95.68051 |
| <ldstOtherXfers, | loads> | 570235, | 0.48917742 | 96.169685 |
| <stores, | ldstOtherXfers> | 543084, | 0.46588588 | 96.635574 |
| <ldstOtherXfers, | ldstOtherJumps> | 350453, | 0.3006369 | 96.93621 |
| <loads, | ldstOther> | 350359, | 0.30055628 | 97.23677 |
| <ldstOtherJumps, | ldstOtherJumps> | 348278, | 0.2987711 | 97.535545 |
| <stores, | ldstOther> | 344352, | 0.29540315 | 97.83095 |
| <ldstOtherXfers, | ldstOtherXfers> | 306705, | 0.2631076 | 98.094055 |
| <ldstOther, | ldstOtherXfers> | 240593, | 0.20639327 | 98.300446 |
| <ldstOther, | ldstOther> | 230342, | 0.19759941 | 98.49805 |
| <ldstOtherImmed, | ldstOtherXfers> | 229615, | 0.19697576 | 98.69502 |
| <ldstOtherJumps, | ldstOther> | 227538, | 0.195194 | 98.89021 |
| <ldstOther, | ldstOtherImmed> | 224138, | 0.1922773 | 99.08249 |
| <ldstOtherXfers, | ldstOther> | 197321, | 0.16927228 | 99.25176 |
| <ldstOtherImmed, | ldstOtherImmed> | 193138, | 0.16568388 | 99.41745 |
| <ldstOtherStackAlu, | ldstOther> | 168210, | 0.14429933 | 99.56175 |
| <ldstOtherStackAlu, | ldstOtherXfers> | 145655, | 0.12495048 | 99.68671 |
| <ldstOtherXfers, | ldstOtherImmed> | 121433, | 0.104171574 | 99.79088 |
| <ldstOther, | ldstOtherJumps> | 111004, | 0.09522504 | 99.8861 |
| <ldstOtherImmed, | ldstOther> | 109926, | 0.09430027 | 99.9804 |
| <ldstOtherXfers, | ldstOtherStackAlu> | 22854, | 0.019605355 | 100.00001 |

PAIR STATISTICS BY GROUP: ALU INPUTS FOR MEMORY ADDRESS
116570187 total pairs

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| <aiMem2, aiMem2> | 11586859, | 9.939814 | 9.939814 |
| <aiAluCbr, aiMem2> | 10602311, | 9.095217 | 19.03503 |
| <aiMem2, aiAluCbr> | 8669873, | 7.4374704 | 26.4725 |
| <aiMem2, aiAlu> | 7844404, | 6.7293396 | 33.20184 |
| <aiImmed, aiMem2> | 6157475, | 5.282204 | 38.484043 |
| <aiMem3Plus,aiAluCbr> | 6142388, | 5.269262 | 43.753304 |
| <aiMem2, aiMem3Plus> | 5732438, | 4.917585 | 48.670887 |
| <aiAluCbr, aiImmed> | 5705539, | 4.89451 | 53.565395 |
| <aiAlu, aiMem2> | 5201676, | 4.46227 | 58.027664 |
| <aiCmplx, aiMem2> | 4161494, | 3.5699472 | 61.59761 |
| <aiAlu, aiMem3Plus> | 3722831, | 3.1936393 | 64.79125 |
| <aiImmed, aiAluCbr> | 3579173, | 3.0704017 | 67.86166 |
| <aiMem2, aiImmed> | 3432140, | 2.9442692 | 70.80592 |
| <aiMem2, aiMem2Plus> | 3045766, | 2.6128173 | 73.41874 |
| <aiMem2Plus,aiMem2> | 2471792, | 2.1204324 | 75.53917 |
| <aiAluCbr, aiAlu> | 2301889, | 1.9746808 | 77.51385 |
| <aiAlu, aiImmed> | 2181620, | 1.8715077 | 79.38535 |
| <aiMem2, aiCmplx> | 1910017, | 1.6385125 | 81.023865 |
| <aiImmed, aiAlu> | 1637570, | 1.4047932 | 82.42866 |
| <aiJump, aiMem2> | 1573477, | 1.3498108 | 83.778465 |
| <aiMem3Plus,aiMem2> | 1416408, | 1.2150688 | 84.99353 |
| <aiMem3Plus,aiImmed> | 1141409, | 0.9791603 | 85.97269 |
| <aiCmplx, aiAlu> | 1084309, | 0.9301769 | 86.90286 |
| <aiImmed, aiCmplx> | 805619, | 0.6911021 | 87.59396 |
| <aiAlu, aiMem2Plus> | 801651, | 0.6876981 | 88.28166 |
| <aiAluPlus, aiMem2> | 787620, | 0.6756616 | 88.95732 |
| <aiAlu, aiAlu> | 778447, | 0.66779256 | 89.625114 |
| <aiMem2, aiAluPlus> | 737893, | 0.6330032 | 90.25812 |
| <aiMem2, aiJump> | 722871, | 0.6201165 | 90.878235 |
| <aiAlu, aiJump> | 604901, | 0.5189157 | 91.39715 |
| <aiMem2Plus,aiMem2Plus> | 573936, | 0.4923523 | 91.8895 |
| <aiMem2Plus,aiAluCbr> | 564857, | 0.48456388 | 92.37407 |
| <aiAlu, aiAluCbr> | 555867, | 0.4768518 | 92.85092 |
| <aiAlu, aiCmplx> | 437983, | 0.37572474 | 93.22665 |
| <aiCmplx, aiCmplx> | 435587, | 0.37366934 | 93.60032 |
| <aiMem2Plus,aiMem3> | 410184, | 0.35187726 | 93.952194 |
| <aiMem3Plus,aiCmplx> | 404927, | 0.34736755 | 94.29956 |
| <aiJump, aiCmplx> | 391111, | 0.33551548 | 94.63508 |
| <aiMem2Plus,aiAlu> | 385687, | 0.33086247 | 94.96594 |
| <aiMem2Plus,aiCmplx> | 370115, | 0.31750398 | 95.28345 |
| <aiImmed, aiAluPlus> | 339449, | 0.2911971 | 95.574646 |
| <aiMem3Plus,aiAlu> | 338884, | 0.2907124 | 95.86536 |
| <aiMem3, aiMem2> | 323824, | 0.27779315 | 96.14315 |
| <aiAluCbr, aiJump> | 318615, | 0.2733246 | 96.41647 |
| <aiImmed, aiJump> | 318517, | 0.27324054 | 96.68971 |
| <aiCmplx, aiImmed> | 295242, | 0.253274 | 96.942986 |
| <aiAluCbr, aiCmplx> | 222470, | 0.1908464 | 97.133835 |
| <aiAlu, aiMem3> | 220730, | 0.18935373 | 97.32319 |
| <aiAluCbr, aiMem2Plus> | 213638, | 0.18326984 | 97.50646 |
| <aiCmplx, aiJump> | 208791, | 0.17911184 | 97.68558 |
| <aiImmed, aiMem3Plus> | 202604, | 0.1738043 | 97.85938 |
| <aiMem3, aiMem2Plus> | 200335, | 0.17185783 | 98.03124 |
| <aiCmplx, aiAluCbr> | 200094, | 0.1716511 | 98.202896 |
| <aiMem2Plus,aiImmed> | 196857, | 0.16887424 | 98.37177 |
| <aiImmed, aiImmed> | 193138, | 0.16568388 | 98.53746 |
| <aiMem3Plus,aiJump> | 166652, | 0.1429628 | 98.68042 |
| <aiAluPlus, aiMem2Plus> | 162178, | 0.13912476 | 98.81954 |
| <aiMem2, aiMem3> | 149076, | 0.1278852 | 98.947426 |
| <aiMem2Plus,aiJump> | 145229, | 0.12458503 | 99.072014 |
| <aiMem3, aiCmplx> | 104879, | 0.08997069 | 99.16199 |
| <aiMem3, aiAlu> | 84430, | 0.072428465 | 99.23441 |
| <aiAluPlus, aiAluCbr> | 83422, | 0.07156375 | 99.30598 |
| <aiJump, aiAlu> | 80405, | 0.068975616 | 99.374954 |
| <aiAluPlus, aiImmed> | 80051, | 0.06867194 | 99.44363 |
| <aiCmplx, aiMem2Plus> | 79398, | 0.06811175 | 99.51174 |
| <aiJump, aiImmed> | 76430, | 0.06556565 | 99.57731 |
| <aiMem3Plus,aiMem2Plus> | 71652, | 0.061466832 | 99.63878 |
| <aiMem2Plus,aiMem3Plus> | 63395, | 0.054383545 | 99.69316 |
| <aiImmed, aiMem2Plus> | 53242, | 0.04567377 | 99.73884 |
| <aiCmplx, aiAluPlus> | 51191, | 0.043914313 | 99.78275 |
| <aiMem3, aiAluCbr> | 41841, | 0.035893397 | 99.81865 |
| <aiMem3, aiImmed> | 32527, | 0.027903361 | 99.84655 |

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<aiImmed,    aiMem3>          30367, 0.0260504     99.8726
<aiMem3,     aiJump>          26395, 0.022643013   99.89524
<aiAluPlus,  aiJump>          23594, 0.020240166   99.91548
<aiJump,     aiAluCbr>        14656, 0.012572683   99.928055
<aiMem2Plus,aiAluPlus>        13940, 0.011958461   99.94001
<aiJump,     aiMem2Plus>      12227, 0.010488961   99.9505
<aiMem3,     aiMem3>          12211, 0.010475235   99.960976
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<aiAluPlus,  aiCmplx>          5370, 0.0046066666  99.9922
<aiMem3Plus,aiMem3>            3286, 0.0028189028  99.99502
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<aiCmplx,    aiMem3>            945, 8.106705e-04  99.99781
<aiJump,     aiMem3Plus>        817, 7.0086536e-04 99.99851
<aiMem3Plus,aiAluPlus>          687, 5.8934455e-04 99.9991
<aiAluPlus,  aiMem3Plus>        570, 4.889758e-04  99.99959
<aiMem3,     aiMem3Plus>        361, 3.0968466e-04 99.9999
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OPCODES SORTED BY SINGLE OCCURENCE FREQUENCY

| Opcode | Count | Per Cent | Cum Percent |
|---|---|---|---|
| JZNEB | 23991607, | 10.2906275 | 10.2906275 |
| LL0 | 20882147, | 8.9569 | 19.247528 |
| RF | 17463158, | 7.4904056 | 26.737934 |
| LIW | 12610361, | 5.4089136 | 32.146847 |
| ADD | 11516841, | 4.939874 | 37.08672 |
| R0 | 10817909, | 4.6400843 | 41.726803 |
| PUSH | 8182853, | 3.5098395 | 45.23664 |
| LG0 | 6967303, | 2.9884584 | 48.225098 |
| LL1 | 5605261, | 2.404243 | 50.62934 |
| RET | 4139512, | 1.7755449 | 52.404884 |
| LL2 | 3781745, | 1.6220894 | 54.026974 |
| LIB | 3717147, | 1.5943816 | 55.621357 |
| LI0 | 3594730, | 1.5418737 | 57.16323 |
| LLB | 3430454, | 1.4714115 | 58.634644 |
| PL0 | 3144341, | 1.34869 | 59.983334 |
| RXLP | 3133505, | 1.3440423 | 61.327377 |
| JZEQB | 3086260, | 1.3237777 | 62.651154 |
| INC | 2954754, | 1.2673712 | 63.918526 |
| LGB | 2908696, | 1.2476157 | 65.16614 |
| LL3 | 2860550, | 1.2269647 | 66.393105 |
| RILP | 2730841, | 1.1713291 | 67.56443 |
| JB | 2644455, | 1.1342759 | 68.69871 |
| LI1 | 2609636, | 1.1193411 | 69.81805 |
| SL1 | 2346204, | 1.0063483 | 70.824394 |
| z377 | 2292541, | 0.9833308 | 71.807724 |
| SL0 | 2286276, | 0.98064356 | 72.78837 |
| SLB | 2254568, | 0.9670431 | 73.75541 |
| JEQB | 2241176, | 0.96129894 | 74.716705 |
| JNEB | 2174935, | 0.9328865 | 75.64959 |
| JULB | 1931167, | 0.82832804 | 76.47792 |
| LG1 | 1653831, | 0.7093714 | 77.187294 |
| LL5 | 1629637, | 0.6989939 | 77.88629 |
| WXLP | 1600935, | 0.6866829 | 78.572975 |
| SUB | 1504900, | 0.64549093 | 79.21847 |
| LI2 | 1471740, | 0.6312678 | 79.84974 |
| LLDB | 1465776, | 0.6287097 | 80.47845 |
| SLDB | 1419336, | 0.60879035 | 81.087234 |
| SL2 | 1375542, | 0.5900059 | 81.67724 |
| RSTR | 1350516, | 0.5792716 | 82.25651 |
| LADRB | 1210940, | 0.51940384 | 82.77591 |
| SL3 | 1192021, | 0.5112889 | 83.2872 |
| LI3 | 1175431, | 0.5041731 | 83.791374 |
| LL4 | 1166026, | 0.50013905 | 84.29151 |
| JW | 1149992, | 0.49326162 | 84.784775 |
| WF | 1128552, | 0.48406549 | 85.26884 |
| SHIFT | 1073320, | 0.46037502 | 85.72921 |
| WILP | 1053146, | 0.45172186 | 86.18093 |
| SL4 | 959190, | 0.41142168 | 86.592354 |
| JUGB | 957275, | 0.41060028 | 87.00295 |
| PL1 | 928234, | 0.39814386 | 87.4011 |
| WSTR | 853747, | 0.3661944 | 87.767296 |
| PL2 | 834472, | 0.35792687 | 88.12522 |
| LG6 | 780393, | 0.33473096 | 88.45995 |
| LG5 | 764367, | 0.327857 | 88.78781 |
| LL6 | 723409, | 0.31028905 | 89.0981 |
| LLKB | 714007, | 0.30625627 | 89.40436 |
| SGB | 693947, | 0.29765203 | 89.70201 |
| SL5 | 660092, | 0.28313074 | 89.985146 |
| RIGP | 645873, | 0.2770318 | 90.26218 |
| LIN1 | 605516, | 0.25972164 | 90.5219 |
| AND | 603497, | 0.25885563 | 90.780754 |
| MUL | 586483, | 0.25155787 | 91.03231 |
| JIW | 555268, | 0.23816895 | 91.27048 |
| WSF | 537936, | 0.23073483 | 91.50121 |
| SL6 | 535088, | 0.22951322 | 91.73073 |
| LG4 | 534721, | 0.22935581 | 91.96008 |
| JNE7 | 534244, | 0.22915123 | 92.18923 |
| LG3 | 531908, | 0.22814927 | 92.41738 |
| JLB | 483964, | 0.20758481 | 92.62497 |
| RB | 460332, | 0.19744844 | 92.82242 |
| RIL0 | 440372, | 0.18888706 | 93.01131 |
| LI5 | 435327, | 0.18672313 | 93.19803 |
| JULEB | 421291, | 0.18070273 | 93.37873 |

| | | | |
|---|---|---|---|
| JNE4 | 411515, | 0.17650955 | 93.55524 |
| SG1 | 407335, | 0.17471662 | 93.72995 |
| R1 | 405708, | 0.17401876 | 93.90397 |
| JNE5 | 399423, | 0.17132297 | 94.075294 |
| WB | 392025, | 0.16814978 | 94.24345 |
| PL3 | 383044, | 0.16429758 | 94.407745 |
| JNE9 | 380865, | 0.16336296 | 94.571106 |
| JEQ5 | 344231, | 0.14764967 | 94.71876 |
| EFCB | 342170, | 0.14676566 | 94.865524 |
| DBL | 341387, | 0.1464298 | 95.011955 |
| LG2 | 340142, | 0.14589581 | 95.15785 |
| GADRB | 337893, | 0.14493114 | 95.30278 |
| JGB | 337887, | 0.14492856 | 95.44771 |
| EXCH | 332629, | 0.14267326 | 95.59038 |
| RFC | 303131, | 0.13002081 | 95.7204 |
| LI4 | 295750, | 0.12685491 | 95.84725 |
| SFC | 289729, | 0.12427235 | 95.97153 |
| LG7 | 288892, | 0.123913336 | 96.09544 |
| LL7 | 286525, | 0.122898054 | 96.21834 |
| JUGEB | 277920, | 0.119207155 | 96.33755 |
| SL7 | 276920, | 0.11877823 | 96.45633 |
| BLTC | 274127, | 0.11758025 | 96.573906 |
| EFC1 | 269551, | 0.115617466 | 96.68952 |
| J2 | 258409, | 0.11083838 | 96.80036 |
| W0 | 256547, | 0.11003972 | 96.9104 |
| LFCB | 241217, | 0.10346428 | 97.01386 |
| SG0 | 236538, | 0.10145733 | 97.11532 |
| J3 | 234348, | 0.10051798 | 97.215836 |
| EFC4 | 219011, | 0.09393954 | 97.30978 |
| DUP | 217300, | 0.09320565 | 97.402985 |
| POP | 198773, | 0.08525894 | 97.48824 |
| JNE2 | 195717, | 0.083948135 | 97.57219 |
| JEQ7 | 193484, | 0.08299035 | 97.65518 |
| JEQ4 | 192166, | 0.08242502 | 97.73761 |
| EFC5 | 191006, | 0.08192747 | 97.819534 |
| LGDB | 186500, | 0.079994726 | 97.89953 |
| LFC1 | 174262, | 0.07474553 | 97.97427 |
| EFC2 | 151590, | 0.065020914 | 98.03929 |
| WSB | 150648, | 0.064616866 | 98.103905 |
| LFC7 | 142077, | 0.060940542 | 98.16485 |
| JLEB | 137744, | 0.059082007 | 98.22393 |
| LFC2 | 136215, | 0.05842617 | 98.28236 |
| LFC4 | 132151, | 0.05668302 | 98.33904 |
| BLT | 131402, | 0.05636176 | 98.3954 |
| LFC3 | 130268, | 0.05587535 | 98.45128 |
| LI6 | 123858, | 0.05312593 | 98.5044 |
| LFC6 | 116650, | 0.050034232 | 98.554436 |
| JEQ3 | 110792, | 0.047521586 | 98.60196 |
| EFC3 | 107524, | 0.046119857 | 98.64808 |
| EFC15 | 107069, | 0.045924692 | 98.694 |
| EFC0 | 103615, | 0.044443183 | 98.73844 |
| LINKB | 102080, | 0.04378478 | 98.78223 |
| JGEB | 100623, | 0.043159838 | 98.825386 |
| J4 | 99520, | 0.04268673 | 98.86807 |
| MISC | 99438, | 0.042651563 | 98.91072 |
| CATCH | 98437, | 0.042222204 | 98.95294 |
| SGDB | 98238, | 0.042136846 | 98.99508 |
| DADD | 95985, | 0.041170478 | 99.03625 |
| EFC11 | 94752, | 0.04064161 | 99.07689 |
| J6 | 93153, | 0.03995576 | 99.116844 |
| EFC7 | 90955, | 0.039012976 | 99.15586 |
| JNE8 | 90359, | 0.03875734 | 99.19462 |
| JNE3 | 82819, | 0.035523233 | 99.23014 |
| J5 | 80986, | 0.034737015 | 99.26488 |
| IWDC | 75894, | 0.032552924 | 99.29743 |
| DWDC | 75689, | 0.032464993 | 99.329895 |
| WSDB | 66335, | 0.028452816 | 99.358345 |
| DESCB | 66047, | 0.028329287 | 99.38667 |
| DUCOMP | 65284, | 0.028002014 | 99.41467 |
| JNE6 | 63357, | 0.027175474 | 99.44185 |
| DSUB | 63112, | 0.027070384 | 99.46892 |
| RD0 | 58646, | 0.025154803 | 99.49407 |
| EFC9 | 58270, | 0.024993525 | 99.519066 |
| J7 | 57540, | 0.02468041 | 99.54375 |
| WS0 | 51399, | 0.022046375 | 99.565796 |
| R3 | 49757, | 0.021342077 | 99.587135 |

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|---|---|---|---|
| DIV | 49019, | 0.021025531 | 99.60816 |
| J8 | 48608, | 0.020849242 | 99.62901 |
| OR | 45384, | 0.019466383 | 99.648476 |
| KFCB | 43245, | 0.018548912 | 99.66702 |
| EFC14 | 43044, | 0.018462696 | 99.685486 |
| SG3 | 34216, | 0.014676137 | 99.700165 |
| EFC6 | 33750, | 0.014476256 | 99.71464 |
| JEQ8 | 33459, | 0.0143514395 | 99.72899 |
| LFC5 | 31531, | 0.01352447 | 99.742516 |
| LFC11 | 31327, | 0.013436971 | 99.75595 |
| LFC8 | 30067, | 0.0128965235 | 99.768845 |
| R4 | 29708, | 0.012742537 | 99.781586 |
| DESCBS | 25289, | 0.010847113 | 99.792435 |
| RBL | 24668, | 0.0105807495 | 99.80302 |
| XOR | 24146, | 0.010356851 | 99.81337 |
| JEQ6 | 23846, | 0.010228173 | 99.8236 |
| W2 | 23821, | 0.01021745 | 99.83382 |
| NEG | 23119, | 0.009916344 | 99.843735 |
| RDB | 22649, | 0.009714747 | 99.85345 |
| SG2 | 21946, | 0.009413213 | 99.86286 |
| W1 | 21213, | 0.00909881 | 99.87196 |
| EFC10 | 21050, | 0.009028894 | 99.88099 |
| R2 | 20836, | 0.008937105 | 99.88992 |
| EFC8 | 20137, | 0.008637286 | 99.89856 |
| DCOMP | 19972, | 0.008566513 | 99.90713 |
| LDIV | 19322, | 0.008287711 | 99.91541 |
| WD0 | 19149, | 0.008213507 | 99.92363 |
| J9 | 17807, | 0.0076378875 | 99.93127 |
| JEQ9 | 17627, | 0.0075606813 | 99.93883 |
| LFC16 | 17170, | 0.0073646617 | 99.94619 |
| EFC13 | 15254, | 0.00654284 | 99.952736 |
| LINI | 12611, | 0.005409188 | 99.958145 |
| LFC9 | 12138, | 0.0052063055 | 99.96335 |
| LFC15 | 11986, | 0.0051411085 | 99.96849 |
| WDB | 10686, | 0.0045835047 | 99.973076 |
| MRE | 10248, | 0.0043956356 | 99.97747 |
| WBL | 10124, | 0.0043424482 | 99.98181 |
| EFC12 | 8703, | 0.00732944 | 99.98554 |
| MXW | 8686, | 0.0037256525 | 99.989265 |
| ME | 4741, | 0.002033539 | 99.9913 |
| MXD | 4722, | 0.0020253892 | 99.993324 |
| ALLOC | 3859, | 0.001655226 | 99.99498 |
| FREE | 3120, | 0.0013382496 | 99.996315 |
| DST | 2277, | 9.766649e-04 | 99.99729 |
| LSTF | 1878, | 8.055233e-04 | 99.9981 |
| LFC14 | 1547, | 6.635487e-04 | 99.998764 |
| LFC12 | 1345, | 5.769057e-04 | 99.999344 |
| JEQ2 | 880, | 3.7745502e-04 | 99.99972 |
| BLTL | 189, | 8.106705e-05 | 99.9998 |
| BITBLT | 156, | 6.691248e-05 | 99.99987 |
| WFS | 84, | 3.6029797e-05 | 99.99991 |
| RFS | 60, | 2.5735569e-05 | 99.99993 |
| REQUEUE | 19, | 8.149597e-06 | 99.99994 |
| NOTIFY | 14, | 6.0049653e-06 | 99.99995 |
| LST | 14, | 6.0049653e-06 | 99.999954 |
| BCAST | 9, | 3.8603354e-06 | 99.99996 |
| PORTO | 6, | 2.573557e-06 | 99.99996 |
| STOP | 4, | 1.7157047e-06 | 99.99996 |
| PORTI | 4, | 1.7157047e-06 | 99.99996 |
| STARTIO | 3, | 1.2867785e-06 | 99.99996 |

PAIRWISE FREQUENCIES

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| <RF,JZNEB> | 5691157 | 2.441086 | 2.441086 |
| <JZNEB,LL0> | 5659746 | 2.427613 | 4.868699 |
| <LL0,RF> | 5415168 | 2.3227072 | 7.1914062 |
| <JZNEB,LIW> | 5258551 | 2.25553 | 9.446936 |
| <LIW,R0> | 5252751 | 2.2530422 | 11.699978 |
| <R0,JZNEB> | 5236077 | 2.2458904 | 13.9458685 |
| <ADD,RF> | 2993741 | 1.2840937 | 15.229962 |
| <LG0,ADD> | 2653170 | 1.138014 | 16.367977 |
| <LL0,LG0> | 1910544 | 0.81948223 | 17.187458 |
| <PUSH,LIB> | 755166 | 0.32391045 | 17.51137 |
| <JULB,PUSH> | 639773 | 0.27441537 | 17.785784 |
| <JZEQB,LL0> | 598163 | 0.25656774 | 18.042353 |
| <PL0,LIW> | 493560 | 0.2117008 | 18.254053 |
| <SLB,PUSH> | 484030 | 0.20761313 | 18.461666 |
| <z377,SHIFT> | 471597 | 0.20228028 | 18.663946 |
| <LL0,ADD> | 460288 | 0.19742955 | 18.861376 |
| <ADD,WF> | 453667 | 0.19458963 | 19.055965 |
| <LIW,JEQB> | 450429 | 0.19320077 | 19.249166 |
| <JEQB,LL0> | 449208 | 0.19267704 | 19.441843 |
| <RF,JZEQB> | 448713 | 0.19246473 | 19.63431 |
| <LGB,RXLP> | 438629 | 0.18813944 | 19.822449 |
| <LLB,JULB> | 400115 | 0.17161979 | 19.994068 |
| <PUSH,SLB> | 377140 | 0.16176522 | 20.155834 |
| <RXLP,LLB> | 352625 | 0.15125008 | 20.307083 |
| <RF,LI1> | 344842 | 0.14791176 | 20.454994 |
| <LI1,SUB> | 331984 | 0.14239662 | 20.597391 |
| <LIB,JNEB> | 329862 | 0.14148643 | 20.738878 |
| <JNEB,PUSH> | 306950 | 0.13165889 | 20.870539 |
| <JUGB,PUSH> | 306450 | 0.13144443 | 21.001982 |
| <ADD,SLB> | 306222 | 0.13134663 | 21.13333 |
| <JEQB,PUSH> | 288898 | 0.1239159 | 21.257244 |
| <LL0,RET> | 288122 | 0.12358307 | 21.380825 |
| <RF,PL0> | 284263 | 0.12192783 | 21.502754 |
| <INC,LLB> | 282583 | 0.121207225 | 21.623962 |
| <SLB,LGB> | 280299 | 0.120227575 | 21.74419 |
| <LI2,JNEB> | 280207 | 0.120188105 | 21.864376 |
| <LIB,ADD> | 279860 | 0.12003927 | 21.984417 |
| <PL0,JZEQB> | 270569 | 0.11605412 | 22.100471 |
| <LLB,INC> | 258809 | 0.11100994 | 22.21148 |
| <LL1,INC> | 258791 | 0.11100223 | 22.322483 |
| <WXLP,LLB> | 258583 | 0.110913014 | 22.433397 |
| <LG0,RXLP> | 257839 | 0.11059389 | 22.54399 |
| <JZNEB,LL1> | 255499 | 0.1095902 | 22.65358 |
| <LL0,LI0> | 255289 | 0.10950012 | 22.763079 |
| <SL0,LL0> | 254404 | 0.10912052 | 22.8722 |
| <LL3,JULB> | 252876 | 0.108465136 | 22.980667 |
| <RET,RET> | 250549 | 0.10746703 | 23.088133 |
| <LLB,WXLP> | 241765 | 0.10369934 | 23.191832 |
| <PUSH,RXLP> | 241647 | 0.10364871 | 23.29548 |
| <RF,LI2> | 239111 | 0.10256095 | 23.39804 |
| <PUSH,LIN1> | 237823 | 0.10200851 | 23.500051 |
| <LIN1,ADD> | 236826 | 0.10158087 | 23.601631 |
| <LL1,LL0> | 233902 | 0.10032668 | 23.701958 |
| <INC,LL3> | 232079 | 0.099544754 | 23.801502 |
| <RF,LI3> | 224508 | 0.09629735 | 23.8978 |
| <z377,PL0> | 224490 | 0.096289635 | 23.99409 |
| <JB,RET> | 223160 | 0.095719156 | 24.08981 |
| <SL1,LL2> | 218257 | 0.09361613 | 24.183426 |
| <MUL,PUSH> | 218205 | 0.093593836 | 24.27702 |
| <ADD,JB> | 212798 | 0.091274624 | 24.368294 |
| <LG4,ADD> | 211595 | 0.09075863 | 24.459053 |
| <LIW,AND> | 210360 | 0.09022891 | 24.549282 |
| <RILP,RILP> | 202513 | 0.08686313 | 24.636143 |
| <LG1,ADD> | 200464 | 0.08598425 | 24.722128 |
| <LI2,MUL> | 197919 | 0.084892635 | 24.80702 |
| <LL2,LL1> | 197032 | 0.08451218 | 24.891533 |
| <PUSH,JZEQB> | 189788 | 0.08140504 | 24.972939 |
| <z377,LLB> | 189446 | 0.081258345 | 25.0542 |
| <ADD,R1> | 188432 | 0.08082341 | 25.13502 |
| <JNEB,LL0> | 186896 | 0.080164585 | 25.215185 |
| <SHIFT,JZNEB> | 182472 | 0.07826701 | 25.293451 |
| <PUSH,SL1> | 181315 | 0.07777074 | 25.371222 |
| <LL0,JZEQB> | 179015 | 0.07678422 | 25.448006 |

| | | | |
|---|---|---|---|
| <LLB,LI0> | 178884 | 0.07672802 | 25.524734 |
| <SL0,RILP> | 178710 | 0.07665339 | 25.601387 |
| <LI0,RSTR> | 178644 | 0.076625085 | 25.678015 |
| <RXLP,LGB> | 177695 | 0.07621803 | 25.75423 |
| <WSTR,LL1> | 176942 | 0.07589505 | 25.830126 |
| <LL1,RSTR> | 175232 | 0.07516158 | 25.905287 |
| <RSTR,LLDB> | 174197 | 0.074717646 | 25.980005 |
| <LLDB,WSTR> | 174194 | 0.07471636 | 26.054722 |
| <RF,LIB> | 174133 | 0.074690194 | 26.129414 |
| <WSF,PUSH> | 173734 | 0.07451905 | 26.20393 |
| <LGB,JEQB> | 173660 | 0.074487314 | 26.278418 |
| <LGB,ADD> | 170721 | 0.073226695 | 26.351643 |
| <RF,LL0> | 168287 | 0.0721827 | 26.423826 |
| <LL1,JZNEB> | 168236 | 0.072160816 | 26.495987 |
| <SL1,PL0> | 165243 | 0.07087704 | 26.566866 |
| <LLKB,RB> | 164884 | 0.07072306 | 26.63759 |
| <LI0,JUGB> | 164853 | 0.07070976 | 26.7083 |
| <LL0,JB> | 163462 | 0.070113125 | 26.778412 |
| <LI1,JNEB> | 163298 | 0.07004278 | 26.848454 |
| <LI0,WSTR> | 160805 | 0.06897347 | 26.917427 |
| <LL2,LL0> | 158720 | 0.06807916 | 26.985508 |
| <JNE9,LL0> | 158441 | 0.06795949 | 27.053467 |
| <RF,LL2> | 156522 | 0.06713638 | 27.120602 |
| <LL2,INC> | 154812 | 0.06640291 | 27.187004 |
| <LL1,LI1> | 154172 | 0.0661284 | 27.253134 |
| <RET,SL1> | 153251 | 0.06573336 | 27.318869 |
| <ADD,RFC> | 151554 | 0.065005474 | 27.383873 |
| <LI5,ADD> | 151271 | 0.06488409 | 27.448755 |
| <JNE5,LL0> | 149880 | 0.06428745 | 27.513044 |
| <PL0,LG0> | 149408 | 0.064085 | 27.57713 |
| <INC,SG1> | 148065 | 0.06350895 | 27.640638 |
| <RILP,JNEB> | 148052 | 0.06350338 | 27.70414 |
| <LG1,INC> | 148051 | 0.06350294 | 27.767643 |
| <JZEQB,LLB> | 147939 | 0.063454905 | 27.831099 |
| <SG1,PUSH> | 147576 | 0.06329921 | 27.894398 |
| <z377,SL0> | 147521 | 0.063275614 | 27.957674 |
| <LIB,JEQB> | 146727 | 0.06293505 | 28.020609 |
| <JNE7,LL0> | 146117 | 0.0626734 | 28.083282 |
| <LL3,INC> | 146067 | 0.06265196 | 28.145937 |
| <RXLP,LL1> | 143926 | 0.061733627 | 28.207668 |
| <LI3,JNE9> | 143804 | 0.061681294 | 28.269348 |
| <JB,LG0> | 143725 | 0.061647415 | 28.330997 |
| <LI0,JB> | 143511 | 0.06155562 | 28.392553 |
| <LL5,ADD> | 141983 | 0.060900216 | 28.453451 |
| <PL0,LIB> | 141279 | 0.060598254 | 28.514051 |
| <LL1,LG0> | 140813 | 0.06039838 | 28.57445 |
| <LL2,JNE5> | 138315 | 0.059326916 | 28.633776 |
| <LI1,JNE7> | 137772 | 0.05909401 | 28.692871 |
| <LL2,RXLP> | 137508 | 0.058980775 | 28.75185 |
| <LIB,JIW> | 137484 | 0.05897049 | 28.810823 |
| <ADD,R0> | 137343 | 0.058910007 | 28.869734 |
| <SL1,LL0> | 135638 | 0.058178687 | 28.92791 |
| <LIW,JNE4> | 134568 | 0.05771973 | 28.985632 |
| <PUSH,SLDB> | 133164 | 0.057117515 | 29.042747 |
| <JLB,PUSH> | 133094 | 0.057087493 | 29.099836 |
| <LL1,LL5> | 132025 | 0.05662898 | 29.156464 |
| <PUSH,SL3> | 131173 | 0.056263533 | 29.212729 |
| <LI0,WSF> | 131144 | 0.056251097 | 29.26898 |
| <JB,PL0> | 130869 | 0.056133132 | 29.32511 |
| <RFC,RET> | 130707 | 0.056063652 | 29.381176 |
| <SL6,PUSH> | 130467 | 0.055960708 | 29.437138 |
| <RILP,ADD> | 129881 | 0.055709357 | 29.492846 |
| <LL3,SUB> | 129596 | 0.05558711 | 29.548433 |
| <LG6,ADD> | 129421 | 0.05551205 | 29.603943 |
| <JZEQB,LL1> | 128626 | 0.055171056 | 29.659117 |
| <JEQB,LL2> | 127896 | 0.05485794 | 29.713974 |
| <ADD,LI0> | 127141 | 0.0545341 | 29.768509 |
| <SL2,LL0> | 126719 | 0.054353094 | 29.822863 |
| <LL1,WXLP> | 125154 | 0.053681827 | 29.876541 |
| <LL0,LI5> | 124871 | 0.05356044 | 29.930103 |
| <WSTR,RILP> | 124677 | 0.05347722 | 29.98358 |
| <LL0,INC> | 123494 | 0.0529698 | 30.03655 |
| <SL2,LL3> | 121614 | 0.05216342 | 30.088715 |
| <JNE4,LL0> | 121445 | 0.052090936 | 30.140804 |
| <LG2,ADD> | 120513 | 0.05169118 | 30.192493 |
| <JIW,LL0> | 120262 | 0.05158352 | 30.24408 |

```
<RET,SL2>          119142 0.05110312     30.295185

>
a=ask questions,
c=input comment string,
f=useFile name,
g=print opcode Groups,
k=KILL paircounts.log,
o=Old data(add it to current table)
p=process table,
q=QUIT
r=regular option,
s=save it,
z=Zero current table

>
```

PRINC OPS

Ld/Store

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| LL0 | LL1 | LL2 | LL3 | LL4 | LL5 | LL6 | LL7 | LLB | LLDB |
| SL0 | SL1 | SL2 | SL3 | SL4 | SL5 | SL6 | SL7 | SLB | PL0 |
| PL1 | PL2 | PL3 | LG0 | LG1 | LG2 | LG3 | LG4 | LG5 | LG6 |
| LG7 | LGB | LGDB | SG0 | SG1 | SG2 | SG3 | SGB | SLDB | SGDB |

Ld Immed

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| LI0 | LI1 | LI2 | LI3 | LI4 | LI5 | LI6 | LIN1 | LINI | LIB |
| LIW | LINB | | | | | | | | |

R/W

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| LADRB | GADRB | LC0 | 75 | 76 | 77 | R0 | R1 | R2 | R3 |
| R4 | RB | W0 | W1 | W2 | WB | RF | WF | RDB | RD0 |
| WDB | WD0 | RSTR | WSTR | RXLP | WXLP | RILP | RIGP | WILP | RIL0 |
| WS0 | WSB | WSF | WSDB | RFC | RFS | WFS | RBL | WBL | RDBL |
| WDBL | RXLPL | WXLPL | RXGPL | WXGPL | RILPL | WILPL | RIGPL | WIGPL | RSTRL |
| WSTRL | RFL | WFL | RFSL | WFSL | | | | | |

Stack Ops

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| PUSH | POP | EXCH | LINKB | DUP | NILCK | NILCKL | BNDCK | | |

Jumps

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| J2 | J3 | J4 | J5 | J6 | J7 | J8 | J9 | JB | JW |
| JIB | JIW | | | | | | | | |

CondJumps

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| JEQ2 | JEQ3 | JEQ4 | JEQ5 | JEQ6 | JEQ7 | JEQ8 | JEQ9 | JEQB | JNE2 |
| JNE3 | JNE4 | JNE5 | JNE6 | JNE7 | JNE8 | JNE9 | JNEB | JLB | JGEB |
| JGB | JLEB | JULB | JUGEB | JUGB | JULEB | JZEQB | JZNEB | | |

ALU Ops

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ADD | SUB | MUL | DBL | DIV | LDIV | NEG | INC | AND | OR |
| XOR | SHIFT | DADD | DSUB | DCOMP | DUCOMP | ADD01 | | | |

Xfers

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| EFC0 | EFC1 | EFC2 | EFC3 | EFC4 | EFC5 | EFC6 | EFC7 | EFC8 | EFC9 |
| EFC10 | EFC11 | EFC12 | EFC13 | EFC14 | EFC15 | EFCB | LFC1 | LFC2 | LFC3 |
| LFC4 | LFC5 | LFC6 | LFC7 | LFC8 | LFC9 | LFC10 | LFC11 | LFC12 | LFC13 |
| LFC14 | LFC15 | LFC16 | LFCB | SFC | RET | LLKB | PORTO | PORTI | KFCB |

Misc

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NOOP | LP | z174 | z175 | z176 | z177 | z271 | z272 | z273 | z274 |
| z275 | z276 | z277 | DESCB | DESCBS | BLT | BLTL | BLTC | BLTCL | ALLOC |
| FREE | IWDC | DWDC | STOP | CATCH | MISC | BITBLT | STARTIO | JRAM | DST |
| LST | LSTF | z373 | WR | RR | BRK | z377 | | | |

Processes

| | | | | | | |
|---|---|---|---|---|---|---|
| ME | MRE | MXW | MXD | NOTIFY | BCAST | REQUEUE |

```
LOCALS VS GLOBALS GROUP . .
locals
LL0     LL1     LL2     LL3     LL4     LL5     LL6     LL7     LLB     LLDB
SL0     SL1     SL2     SL3     SL4     SL5     SL6     SL7     SLB     PL0
PL1     PL2     PL3     LADRB   SLDB

localsIndir
RXLP    WXLP    RILP    WILP    RIL0    RXLPL   WXLPL   RILPL   WILPL

globals
LG0     LG1     LG2     LG3     LG4     LG5     LG6     LG7     LGB     LGDB
SG0     SG1     SG2     SG3     SGB     GADRB   SGDB

globalsIndir
RIGP    RXGPL   WXGPL   RIGPL   WIGPL

addresses
LC0     75      76      77      R0      R1      R2      R3      R4      RB
W0      W1      W2      WB      RF      WF      RDB     RD0     WDB     WD0
RSTR    WSTR    WS0     WSB     WSF     WSDB    RFC     RFS     WFS     RBL
WBL     RDBL    WDBL    RSTRL   WSTRL   RFL     WFL     RFSL    WFSL    LLKB


xfersInLG
EFC0    EFC1    EFC2    EFC3    EFC4    EFC5    EFC6    EFC7    EFC8    EFC9
EFC10   EFC11   EFC12   EFC13   EFC14   EFC15   EFCB    LFC1    LFC2    LFC3
LFC4    LFC5    LFC6    LFC7    LFC8    LFC9    LFC10   LFC11   LFC12   LFC13
LFC14   LFC15   LFC16   LFCB    SFC     RET     PORT0   PORTI   KFCB

LdImmedInLG
LI0     LI1     LI2     LI3     LI4     LI5     LI6     LIN1    LINI    LIB
LIW     LINB

AluInLG
ADD     SUB     MUL     DBL     DIV     LDIV    NEG     INC     AND     OR
XOR     SHIFT   DADD    DSUB    DCOMP   DUCOMP  ADD01

CondJumpsInLG
JEQ2    JEQ3    JEQ4    JEQ5    JEQ6    JEQ7    JEQ8    JEQ9    JEQB    JNE2
JNE3    JNE4    JNE5    JNE6    JNE7    JNE8    JNE9    JNEB    JLB     JGEB
JGB     JLEB    JULB    JUGEB   JUGB    JULEB   JZEQB   JZNEB

JumpsInLG
J2      J3      J4      J5      J6      J7      J8      J9      JB      JW
JIB     JIW

other
NOOP    ME      MRE     MXW     MXD     NOTIFY  BCAST   REQUEUE LP      PUSH
POP     EXCH    LINKB   DUP     NILCK   NILCKL  BNDCK   z174    z175    z176
z177    z271    z272    z273    z274    z275    z276    z277    DESCB   DESCBS
BLT     BLTL    BLTC    BLTCL   ALLOC   FREE    IWDC    DWDC    STOP    CATCH
MISC    BITBLT  STARTIO JRAM    DST     LST     LSTF    z373    WR      RR
BRK     z377
```

MEMORY: LOADS VS STORES

```
loads
LL0     LL1     LL2     LL3     LL4     LL5     LL6     LL7     LLB     LLDB
LG0     LG1     LG2     LG3     LG4     LG5     LG6     LG7     LGB     LGDB
R0      R1      R2      R3      R4      RB      RF      RDB     RD0     RSTR
RXLP    RILP    RIGP    RIL0    RFC     RFS     RBL     RDBL    RXLPL   RXGPL
RILPL   RIGPL   RSTRL   RFL     RFSL

stores
SL0     SL1     SL2     SL3     SL4     SL5     SL6     SL7     SLB     PL0
PL1     PL2     PL3     SG0     SG1     SG2     SG3     SGB     W0      W1
W2      WB      WF      WDB     WD0     WSTR    WXLP    WILP    WS0     WSB
WSF     WSDB    WFS     WBL     WDBL    WXLPL   WXGPL   WILPL   WIGPL   WSTRL
WFL     WFSL    SLDB    SGDB

ldstOtherImmed
LI0     LI1     LI2     LI3     LI4     LI5     LI6     LIN1    LINI    LIB
LIW     LINB    LC0

ldstOtherJumps
J2      J3      J4      J5      J6      J7      J8      J9      JB      JW
JEQ2    JEQ3    JEQ4    JEQ5    JEQ6    JEQ7    JEQ8    JEQ9    JEQB    JNE2
JNE3    JNE4    JNE5    JNE6    JNE7    JNE8    JNE9    JNEB    JLB     JGEB
JGB     JLEB    JULB    JUGEB   JUGB    JULEB   JZEQB   JZNEB   JIB     JIW


ldstOtherStackAlu
LP      PUSH    POP     EXCH    DUP     NILCK   NILCKL  BNDCK   ADD     SUB
MUL     DBL     DIV     LDIV    NEG     INC     AND     OR      XOR     SHIFT
DADD    DSUB    DCOMP   DUCOMP  ADD01

ldstOtherXfers
EFC0    EFC1    EFC2    EFC3    EFC4    EFC5    EFC6    EFC7    EFC8    EFC9
EFC10   EFC11   EFC12   EFC13   EFC14   EFC15   EFCB    LFC1    LFC2    LFC3
LFC4    LFC5    LFC6    LFC7    LFC8    LFC9    LFC10   LFC11   LFC12   LFC13
LFC14   LFC15   LFC16   LFCB    SFC     RET     PORT0   PORTI   KFCB

ldstOther
NOOP    ME      MRE     MXW     MXD     NOTIFY  BCAST   REQUEUE LADRB   GADRB
75      76      77      LINKB   z174    z175    z176    z177    z271    z272
z273    z274    z275    z276    z277    LLKB    DESCB   DESCBS  BLT     BLTL
BLTC    BLTCL   ALLOC   FREE    IWDC    DWDC    STOP    CATCH   MISC    BITBLT
STARTIO JRAM    DST     LST     LSTF    z373    WR      RR      BRK     z377
```

ALU INPUTS FOR MEMORY ADDRESS

aiJump

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| J2 | J3 | J4 | J5 | J6 | J7 | J8 | J9 | JB | JW |

aiAluCbr

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| JEQ2 | JEQ3 | JEQ4 | JEQ5 | JEQ6 | JEQ7 | JEQ8 | JEQ9 | JEQB | JNE2 |
| JNE3 | JNE4 | JNE5 | JNE6 | JNE7 | JNE8 | JNE9 | JNEB | JLB | JGEB |
| JGB | JLEB | JULB | JUGEB | JUGB | JULEB | JZEQB | JZNEB | | |

aiCmplx

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ME | MRE | MXW | MXD | NOTIFY | BCAST | REQUEUE | 75 | 76 | 77 |
| z174 | z175 | z176 | z177 | JIB | JIW | MUL | DIV | LDIV | z271 |
| z272 | z273 | z274 | z275 | z276 | z277 | EFC0 | EFC1 | EFC2 | EFC3 |
| EFC4 | EFC5 | EFC6 | EFC7 | EFC8 | EFC9 | EFC10 | EFC11 | EFC12 | EFC13 |
| EFC14 | EFC15 | EFCB | LFC1 | LFC2 | LFC3 | LFC4 | LFC5 | LFC6 | LFC7 |
| LFC8 | LFC9 | LFC10 | LFC11 | LFC12 | LFC13 | LFC14 | LFC15 | LFC16 | LFCB |
| SFC | RET | PORTO | PORTI | KFCB | BLT | BLTL | BLTC | BLTCL | ALLOC |
| FREE | STOP | MISC | BITBLT | STARTIO | JRAM | DST | LST | LSTF | z373 |
| BRK | z377 | | | | | | | | |

aiMem2

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| LL0 | LL1 | LL2 | LL3 | LL4 | LL5 | LL6 | LL7 | LLB | LLDB |
| SL0 | SL1 | SL2 | SL3 | SL4 | SL5 | SL6 | SL7 | SLB | PL0 |
| PL1 | PL2 | PL3 | LG0 | LG1 | LG2 | LG3 | LG4 | LG5 | LG6 |
| LG7 | LGB | LGDB | SG0 | SG1 | SG2 | SG3 | SGB | R0 | W0 |
| RD0 | WD0 | WS0 | RBL | WBL | RDBL | WDBL | SLDB | SGDB | |

aiMem3

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| R1 | R2 | R3 | R4 | RB | W1 | W2 | WB | RDB | WDB |
| WSB | WSDB | | | | | | | | |

aiAlu

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NOOP | LADRB | GADRB | LP | PUSH | POP | EXCH | DUP | NILCK | NILCKL |
| BNDCK | ADD | SUB | DBL | NEG | INC | AND | OR | XOR | SHIFT |
| DADD | DSUB | DCOMP | DUCOMP | ADD01 | IWDC | DWDC | CATCH | WR | RR |

aiImmed

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| LI0 | LI1 | LI2 | LI3 | LI4 | LI5 | LI6 | LIN1 | LINI | LIB |
| LIW | LINB | LC0 | | | | | | | |

aiMem2Plus

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| RXLP | WXLP | RILP | RIGP | WILP | RIL0 | RXLPL | WXLPL | RXGPL | WXGPL |
| RILPL | WILPL | RIGPL | WIGPL | RFL | WFL | RFSL | WFSL | LLKB | DESCB |
| DESCBS | | | | | | | | | |

aiMem3Plus

| | | | | | |
|---|---|---|---|---|---|
| RF | WF | WSF | RFC | RFS | WFS |

aiAluPlus

| | | | | |
|---|---|---|---|---|
| RSTR | WSTR | RSTRL | WSTRL | LINKB |

```
Alto/Mesa 6.0 of 13-Oct-80 11:47
12-May-81 14:36
>pairfreq -- 135454B

Standard option:
1) Print current table (Standard analysis).
2) Append current table onto 'paircounts.log'.
3) Zero current Table.  Type CR or Y(y)es for Standard option>
a=ask questions,
c=input comment string,
f=useFile name,
g=print opcode Groups,
k=KILL paircounts.log,
o=Old data(add it to current table)
p=process table,
q=QUIT
r=regular option,
s=save it,
z=Zero current table

>
type file name terminated by CR.>static.ocounts

>
Zero table
Done Zeroing Table

>analyze baskett's adder w/ static.  counting ambushed in stream procedures.
( 8-May-81 15:14:20)

>
Copied 2618 records

10372006 pairs

Instruction Frequencies by Opcode
NOOP     (  0)          0 0
ME       (  1)          4 3.8565345e-05
MRE      (  2)       2454 0.02365984
MXW      (  3)       1919 0.018501725
MXD      (  4)          4 3.8565345e-05
NOTIFY   (  5)          0 0
BCAST    (  6)          0 0
REQUEUE  (  7)          0 0
LL0      ( 10)     662410 6.3865175
LL1      ( 11)     161270 1.5548583
LL2      ( 12)     182944 1.7638247
LL3      ( 13)     154693 1.4914472
LL4      ( 14)      64520 0.62205906
LL5      ( 15)     126408 1.218742
LL6      ( 16)      22048 0.2125722
LL7      ( 17)       2991 0.028837237
LLB      ( 20)      47482 0.45778995
LLDB     ( 21)     730510 7.0430927
SL0      ( 22)     117019 1.1282195
SL1      ( 23)     137125 1.3220682
SL2      ( 24)      43768 0.421982
SL3      ( 25)      33532 0.3232933
SL4      ( 26)      61076 0.58885427
SL5      ( 27)     114804 1.106864
SL6      ( 30)      21704 0.20925555
SL7      ( 31)       1474 0.01421133
SLB      ( 32)      66245 0.6386904
PL0      ( 33)     118345 1.141004
PL1      ( 34)       9600 0.09255683
PL2      ( 35)      45334 0.43708034
PL3      ( 36)      18356 0.17697639
LG0      ( 37)       7286 0.07024678
LG1      ( 40)      15664 0.1510219
LG2      ( 41)      13340 0.12861543
LG3      ( 42)       4150 0.04001155
LG4      ( 43)      12694 0.12238712
LG5      ( 44)       3874 0.037350538
LG6      ( 45)        906 0.00873505
LG7      ( 46)        148 0.0014269176
LGB      ( 47)      40880 0.39413786
```

| | | | |
|---|---|---|---|
| LGDB | ( 50) | 51178 | 0.49342432 |
| SG0 | ( 51) | 48 | 4.627842e-04 |
| SG1 | ( 52) | 10 | 9.6413364e-05 |
| SG2 | ( 53) | 8 | 7.713069e-05 |
| SG3 | ( 54) | 224 | 0.0021596594 |
| SGB | ( 55) | 10182 | 0.09816809 |
| LI0 | ( 56) | 406245 | 3.916745 |
| LI1 | ( 57) | 50230 | 0.48428435 |
| LI2 | ( 60) | 10177 | 0.09811989 |
| LI3 | ( 61) | 2454 | 0.02365984 |
| LI4 | ( 62) | 9734 | 0.09384877 |
| LI5 | ( 63) | 3760 | 0.036251426 |
| LI6 | ( 64) | 602 | 0.005804085 |
| LIN1 | ( 65) | 3455 | 0.03331082 |
| LINI | ( 66) | 0 | 0 |
| LIB | ( 67) | 476775 | 4.5967484 |
| LIW | ( 70) | 129069 | 1.2443976 |
| LINB | ( 71) | 0 | 0 |
| LADRB | ( 72) | 78552 | 0.75734625 |
| GADRB | ( 73) | 34990 | 0.33735037 |
| LCO | ( 74) | 0 | 0 |
| 75 | ( 75) | 0 | 0 |
| 76 | ( 76) | 0 | 0 |
| 77 | ( 77) | 0 | 0 |
| R0 | (100) | 190646 | 1.8380823 |
| R1 | (101) | 2742 | 0.026436543 |
| R2 | (102) | 362 | 0.0034901638 |
| R3 | (103) | 2368 | 0.022830682 |
| R4 | (104) | 2704 | 0.026070175 |
| RB | (105) | 1212 | 0.0116853 |
| W0 | (106) | 3920 | 0.03779404 |
| W1 | (107) | 3744 | 0.036097167 |
| W2 | (110) | 142 | 0.0013690698 |
| WB | (111) | 889 | 0.008571148 |
| RF | (112) | 114133 | 1.1003947 |
| WF | (113) | 642 | 0.006189738 |
| RDB | (114) | 18369 | 0.17710172 |
| RD0 | (115) | 22434 | 0.21629376 |
| WDB | (116) | 108 | 0.0010412644 |
| WD0 | (117) | 12191 | 0.11753752 |
| RSTR | (120) | 141716 | 1.3663316 |
| WSTR | (121) | 12322 | 0.118800545 |
| RXLP | (122) | 21395 | 0.2062764 |
| WXLP | (123) | 662 | 0.0063825645 |
| RILP | (124) | 322109 | 3.1055613 |
| RIGP | (125) | 17154 | 0.16538749 |
| WILP | (126) | 119595 | 1.1530557 |
| RIL0 | (127) | 25060 | 0.24161191 |
| WS0 | (130) | 302 | 0.0029116836 |
| WSB | (131) | 714 | 0.0068839145 |
| WSF | (132) | 2396 | 0.02310064 |
| WSDB | (133) | 32621 | 0.31451 |
| RFC | (134) | 150 | 0.0014462005 |
| RFS | (135) | 0 | 0 |
| WFS | (136) | 0 | 0 |
| RBL | (137) | 4158 | 0.040088682 |
| WBL | (140) | 3095 | 0.029839935 |
| RDBL | (141) | 152282 | 1.468202 |
| WDBL | (142) | 32349 | 0.3118876 |
| RXLPL | (143) | 0 | 0 |
| WXLPL | (144) | 0 | 0 |
| RXGPL | (145) | 0 | 0 |
| WXGPL | (146) | 0 | 0 |
| RILPL | (147) | 294 | 0.0028345528 |
| WILPL | (150) | 0 | 0 |
| RIGPL | (151) | 0 | 0 |
| WIGPL | (152) | 0 | 0 |
| RSTRL | (153) | 26954 | 0.25987258 |
| WSTRL | (154) | 5858 | 0.056478953 |
| RFL | (155) | 29440 | 0.28384094 |
| WFL | (156) | 25939 | 0.25008664 |
| RFSL | (157) | 0 | 0 |
| WFSL | (160) | 0 | 0 |
| LP | (161) | 562 | 0.0054184313 |
| SLDB | (162) | 533914 | 5.1476445 |
| SGDB | (163) | 7082 | 0.06827994 |

| | | | |
|---|---|---|---|
| PUSH | (164) | 511092 | 4.92761 |
| POP | (165) | 18115 | 0.17465281 |
| EXCH | (166) | 90807 | 0.87550087 |
| LINKB | (167) | 53643 | 0.5171902 |
| DUP | (170) | 61055 | 0.58865175 |
| NILCK | (171) | 119508 | 1.1522168 |
| NILCKL | (172) | 276181 | 2.6627538 |
| BNDCK | (173) | 137810 | 1.3286725 |
| z174 | (174) | 0 | 0 |
| z175 | (175) | 0 | 0 |
| z176 | (176) | 0 | 0 |
| z177 | (177) | 0 | 0 |
| J2 | (200) | 21769 | 0.20988224 |
| J3 | (201) | 7537 | 0.07266675 |
| J4 | (202) | 1152 | 0.01110682 |
| J5 | (203) | 158 | 0.0015233312 |
| J6 | (204) | 18 | 1.7354406e-04 |
| J7 | (205) | 890 | 0.008580789 |
| J8 | (206) | 0 | 0 |
| J9 | (207) | 1748 | 0.016853057 |
| JB | (210) | 109355 | 1.0543283 |
| JW | (211) | 37262 | 0.35925546 |
| JEQ2 | (212) | 0 | 0 |
| JEQ3 | (213) | 428 | 0.004126492 |
| JEQ4 | (214) | 1512 | 0.014577701 |
| JEQ5 | (215) | 1959 | 0.018887378 |
| JEQ6 | (216) | 8 | 7.713069e-05 |
| JEQ7 | (217) | 697 | 0.0067200127 |
| JEQ8 | (220) | 284 | 0.0027381396 |
| JEQ9 | (221) | 96 | 9.255684e-04 |
| JEQB | (222) | 30005 | 0.2892883 |
| JNE2 | (223) | 0 | 0 |
| JNE3 | (224) | 868 | 0.00836868 |
| JNE4 | (225) | 9684 | 0.0933667 |
| JNE5 | (226) | 702 | 0.006768218 |
| JNE6 | (227) | 405 | 0.0039047413 |
| JNE7 | (230) | 11798 | 0.11374849 |
| JNE8 | (231) | 12 | 1.1569605e-04 |
| JNE9 | (232) | 785 | 0.007568449 |
| JNEB | (233) | 13564 | 0.1307751 |
| JLB | (234) | 105863 | 1.0206608 |
| JGEB | (235) | 20465 | 0.19730996 |
| JGB | (236) | 59107 | 0.5698705 |
| JLEB | (237) | 609 | 0.0058715734 |
| JULB | (240) | 41564 | 0.40073252 |
| JUGEB | (241) | 2864 | 0.027612786 |
| JUGB | (242) | 2628 | 0.025337431 |
| JULEB | (243) | 56203 | 0.541872 |
| JZEQB | (244) | 197166 | 1.9009438 |
| JZNEB | (245) | 314475 | 3.0319593 |
| JIB | (246) | 0 | 0 |
| JIW | (247) | 2125 | 0.020487838 |
| ADD | (250) | 241286 | 2.3263195 |
| SUB | (251) | 144918 | 1.3972032 |
| MUL | (252) | 269746 | 2.600712 |
| DBL | (253) | 22499 | 0.21692042 |
| DIV | (254) | 8134 | 0.07842263 |
| LDIV | (255) | 5428 | 0.052333174 |
| NEG | (256) | 102 | 9.834164e-04 |
| INC | (257) | 126437 | 1.2190217 |
| AND | (260) | 18124 | 0.17473959 |
| OR | (261) | 84359 | 0.8133335 |
| XOR | (262) | 16415 | 0.15826255 |
| SHIFT | (263) | 3572 | 0.03443885 |
| DADD | (264) | 93228 | 0.8988425 |
| DSUB | (265) | 2328 | 0.02244503 |
| DCOMP | (266) | 286 | 0.0027574224 |
| DUCOMP | (267) | 79424 | 0.7657535 |
| ADD01 | (270) | 0 | 0 |
| z271 | (271) | 0 | 0 |
| z272 | (272) | 0 | 0 |
| z273 | (273) | 0 | 0 |
| z274 | (274) | 0 | 0 |
| z275 | (275) | 0 | 0 |
| z276 | (276) | 0 | 0 |
| z277 | (277) | 0 | 0 |

| | | | |
|---|---|---|---|
| EIC0 | (300) | 2964 | 0.02857692 |
| EIC1 | (301) | 8686 | 0.08374464 |
| EIC2 | (302) | 186 | 0.0017932885 |
| EFC3 | (303) | 137 | 0.001320863 |
| EFC4 | (304) | 137 | 0.001320863 |
| EFC5 | (305) | 15544 | 0.14986494 |
| EFC6 | (306) | 7 | 6.748936e-05 |
| EFC7 | (307) | 8 | 7.713069e-05 |
| EFC8 | (310) | 202 | 0.0019475498 |
| EFC9 | (311) | 206 | 0.0019861153 |
| EFC10 | (312) | 111 | 0.0010701884 |
| EFC11 | (313) | 111 | 0.0010701884 |
| EFC12 | (314) | 3 | 2.8924012e-05 |
| EFC13 | (315) | 1 | 9.641336e-06 |
| EFC14 | (316) | 111 | 0.0010701884 |
| EFC15 | (317) | 56 | 5.3991485e-04 |
| EFCB | (320) | 1 | 9.641336e-06 |
| LFC1 | (321) | 14563 | 0.14040679 |
| LFC2 | (322) | 8195 | 0.07901075 |
| LFC3 | (323) | 6777 | 0.06533934 |
| LFC4 | (324) | 25896 | 0.24967206 |
| LFC5 | (325) | 2882 | 0.027786331 |
| LFC6 | (326) | 100 | 9.6413374e-04 |
| LFC7 | (327) | 60 | 5.7848024e-04 |
| LFC8 | (330) | 7332 | 0.070690274 |
| LFC9 | (331) | 3046 | 0.029367509 |
| LFC10 | (332) | 606 | 0.00584265 |
| LFC11 | (333) | 18720 | 0.18048582 |
| LFC12 | (334) | 457 | 0.0044060907 |
| LFC13 | (335) | 511 | 0.004926723 |
| LFC14 | (336) | 2986 | 0.028789032 |
| LFC15 | (337) | 2 | 1.9282673e-05 |
| LFC16 | (340) | 876 | 0.00844581 |
| LFCB | (341) | 15175 | 0.14630729 |
| SFC | (342) | 73761 | 0.71115465 |
| RET | (343) | 252951 | 2.4387858 |
| LLKB | (344) | 674 | 0.0064982605 |
| PORTO | (345) | 0 | 0 |
| PORTI | (346) | 0 | 0 |
| KFCB | (347) | 86379 | 0.83280907 |
| DESCB | (350) | 9762 | 0.09411873 |
| DESCBS | (351) | 26 | 2.5067475e-04 |
| BLT | (352) | 3958 | 0.03816041 |
| BLTL | (353) | 14 | 1.3497871e-04 |
| BLTC | (354) | 282 | 0.0027188568 |
| BLTCL | (355) | 0 | 0 |
| ALLOC | (356) | 4290 | 0.041361332 |
| FREE | (357) | 4316 | 0.041612005 |
| IWDC | (360) | 2370 | 0.022849967 |
| DWDC | (361) | 2370 | 0.022849967 |
| STOP | (362) | 0 | 0 |
| CATCH | (363) | 2824 | 0.027227135 |
| MISC | (364) | 22733 | 0.2191765 |
| BITBLT | (365) | 0 | 0 |
| STARTIO | (366) | 0 | 0 |
| JRAM | (367) | 0 | 0 |
| DST | (370) | 7070 | 0.06816425 |
| LST | (371) | 1 | 9.641336e-06 |
| LSTF | (372) | 7079 | 0.06825102 |
| z373 | (373) | 0 | 0 |
| WR | (374) | 0 | 0 |
| RR | (375) | 0 | 0 |
| BRK | (376) | 0 | 0 |
| z377 | (377) | 104826 | 1.0106628 |

STATISTICS FOR 'PRINC OPS'

Instruction Frequencies by Group: PRINC OPS

| | | | |
|---|---|---|---|
| Ld/Store | 3645246 | 35.145042 | 35.145042 |
| R/W | 1466713 | 14.141074 | 49.286118 |
| Stack Ops | 1268211 | 12.227249 | 61.513367 |
| ALU Ops | 1116286 | 10.762489 | 72.275856 |
| Ld Immed | 1092501 | 10.53317 | 82.80903 |
| CondJumps | 873751 | 8.424128 | 91.233154 |
| Xfers | 550420 | 5.3067846 | 96.53994 |
| Jumps | 182014 | 1.7548581 | 98.2948 |
| Misc | 172483 | 1.6629666 | 99.95776 |
| Processes | 4381 | 0.042238693 | 100.0 |

OPCODES WITHIN GROUPS OF PRINC OPS

In 'PRINC OPS', Opcode frequencies for 'Ld/Store' (35.145042)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| LLDB | 730510 | 20.040073 | 20.040073 | 7.0430927 | 7.0430927 |
| LLO | 662410 | 18.171886 | 38.21196 | 6.3865175 | 13.42961 |
| SLDB | 533914 | 14.646858 | 52.858818 | 5.1476445 | 18.577255 |
| LL2 | 182944 | 5.018701 | 57.877518 | 1.7638247 | 20.34108 |
| LL1 | 161270 | 4.424118 | 62.301636 | 1.5548583 | 21.895939 |
| LL3 | 154693 | 4.2436914 | 66.54533 | 1.4914472 | 23.387386 |
| SL1 | 137125 | 3.761749 | 70.307076 | 1.3220682 | 24.709454 |
| LL5 | 126408 | 3.4677494 | 73.774826 | 1.218742 | 25.928196 |
| PLO | 118345 | 3.2465572 | 77.021385 | 1.141004 | 27.0692 |
| SLO | 117019 | 3.210181 | 80.23157 | 1.1282195 | 28.19742 |
| SL5 | 114804 | 3.149417 | 83.38098 | 1.106864 | 29.304283 |
| SLB | 66245 | 1.8172985 | 85.19828 | 0.6386904 | 29.942974 |
| LL4 | 64520 | 1.7699765 | 86.968254 | 0.62205906 | 30.565033 |
| SL4 | 61076 | 1.6754974 | 88.64375 | 0.58885427 | 31.153887 |
| LGDB | 51178 | 1.4039656 | 90.04772 | 0.49342432 | 31.64731 |
| LLB | 47482 | 1.3025733 | 91.350296 | 0.45778995 | 32.1051 |
| PL2 | 45334 | 1.2436472 | 92.59394 | 0.43708034 | 32.54218 |
| SL2 | 43768 | 1.2006872 | 93.794624 | 0.421982 | 32.96416 |
| LGB | 40880 | 1.1214607 | 94.916084 | 0.39413786 | 33.3583 |
| SL3 | 33532 | 0.91988306 | 95.83597 | 0.3232933 | 33.68159 |
| LL6 | 22048 | 0.6048426 | 96.44081 | 0.2125722 | 33.894165 |
| SL6 | 21704 | 0.5954056 | 97.03622 | 0.20925555 | 34.10342 |
| PL3 | 18356 | 0.50356 | 97.53978 | 0.17697639 | 34.280396 |
| LG1 | 15664 | 0.4297104 | 97.96949 | 0.1510219 | 34.431416 |
| LG2 | 13340 | 0.3659561 | 98.33545 | 0.12861543 | 34.56003 |
| LG4 | 12694 | 0.3482344 | 98.683685 | 0.12238712 | 34.68242 |
| SGB | 10182 | 0.27932272 | 98.963005 | 0.09816809 | 34.780586 |
| PL1 | 9600 | 0.2633567 | 99.226364 | 0.09255683 | 34.873142 |
| LGO | 7286 | 0.19987678 | 99.42624 | 0.07024678 | 34.94339 |
| SGDB | 7082 | 0.19428044 | 99.62052 | 0.06827994 | 35.01167 |
| LG3 | 4150 | 0.11384691 | 99.73437 | 0.04001155 | 35.05168 |
| LG5 | 3874 | 0.106275415 | 99.840645 | 0.037350538 | 35.08903 |
| LL7 | 2991 | 0.08205208 | 99.9227 | 0.028837237 | 35.11787 |
| SL7 | 1474 | 0.040436225 | 99.963135 | 0.01421133 | 35.13208 |
| LG6 | 906 | 0.024854288 | 99.98799 | 0.00873505 | 35.140816 |
| SG3 | 224 | 0.00614499 | 99.99413 | 0.0021596594 | 35.142975 |
| LG7 | 148 | 0.0040600824 | 99.99819 | 0.0014269176 | 35.1444 |
| SGO | 48 | 0.0013167834 | 99.99951 | 4.627842e-04 | 35.144863 |
| SG1 | 10 | 2.743299e-04 | 99.99979 | 9.6413364e-05 | 35.14496 |
| SG2 | 8 | 2.1946392e-04 | 100.00001 | 7.713069e-05 | 35.145035 |

In 'PRINC OPS', Opcode frequencies for 'R/W' (14.141074)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RILP | 322109 | 21.961285 | 21.961285 | 3.1055613 | 38.250595 |
| RO | 190646 | 12.99818 | 34.959465 | 1.8380823 | 40.088676 |
| RDBL | 152282 | 10.382535 | 45.342 | 1.468202 | 41.556877 |
| RSTR | 141716 | 9.662149 | 55.00415 | 1.3663316 | 42.92321 |
| WILP | 119595 | 8.153947 | 63.158096 | 1.1530557 | 44.076267 |
| RF | 114133 | 7.7815495 | 70.939644 | 1.1003947 | 45.176662 |
| LADRB | 78552 | 5.355649 | 76.295296 | 0.75734625 | 45.93401 |
| GADRB | 34990 | 2.3856065 | 78.6809 | 0.33735037 | 46.27136 |
| WSDB | 32621 | 2.224089 | 80.90499 | 0.31451 | 46.58587 |
| WDBL | 32349 | 2.205544 | 83.110535 | 0.3118876 | 46.897755 |
| RFL | 29440 | 2.0072093 | 85.117744 | 0.28384094 | 47.181595 |
| RSTRL | 26954 | 1.8377148 | 86.95546 | 0.25987258 | 47.441467 |
| WFL | 25939 | 1.7685122 | 88.72397 | 0.25008664 | 47.691555 |
| RILO | 25060 | 1.7085824 | 90.43255 | 0.24161191 | 47.933167 |
| RDO | 22434 | 1.5295425 | 91.96209 | 0.21629376 | 48.14946 |
| RXLP | 21395 | 1.4587039 | 93.42079 | 0.2062764 | 48.355736 |
| RDB | 18369 | 1.2523922 | 94.67319 | 0.17710172 | 48.532837 |
| RIGP | 17154 | 1.169554 | 95.84274 | 0.16538749 | 48.698223 |
| WSTR | 12322 | 0.8401099 | 96.68285 | 0.118800545 | 48.817024 |
| WDO | 12191 | 0.8311783 | 97.51403 | 0.11753752 | 48.934563 |

| | | | | | |
|---|---|---|---|---|---|
| WSTRL | 5858 | 0.39939647 | 97.91343 | 0.056478953 | 48.991043 |
| RBL | 4158 | 0.28349104 | 98.19692 | 0.040088682 | 49.03113 |
| W0 | 3920 | 0.26726432 | 98.46419 | 0.03779404 | 49.068924 |
| W1 | 3744 | 0.25526466 | 98.71945 | 0.036097167 | 49.105022 |
| WBL | 3095 | 0.21101606 | 98.930466 | 0.029839935 | 49.13486 |
| R1 | 2742 | 0.18694864 | 99.11742 | 0.026436543 | 49.161297 |
| R4 | 2704 | 0.18435781 | 99.30177 | 0.026070175 | 49.187366 |
| WSF | 2396 | 0.16335847 | 99.46513 | 0.02310064 | 49.21047 |
| R3 | 2368 | 0.16144944 | 99.62659 | 0.022830682 | 49.2333 |
| RB | 1212 | 0.08263376 | 99.70922 | 0.0116853 | 49.244984 |
| WB | 889 | 0.06061172 | 99.76983 | 0.008571148 | 49.253555 |
| WSB | 714 | 0.048680277 | 99.81851 | 0.0068839145 | 49.26044 |
| WXLP | 662 | 0.045134935 | 99.86365 | 0.0063825645 | 49.266823 |
| WF | 642 | 0.043771343 | 99.90742 | 0.006189738 | 49.273014 |
| R2 | 362 | 0.024681039 | 99.9321 | 0.0034901638 | 49.276505 |
| WS0 | 302 | 0.02059026 | 99.95269 | 0.0029116836 | 49.279415 |
| RILPL | 294 | 0.02004482 | 99.97273 | 0.0028345528 | 49.28225 |
| RFC | 150 | 0.010226951 | 99.982956 | 0.0014462005 | 49.283695 |
| W2 | 142 | 0.009681512 | 99.99264 | 0.0013690698 | 49.285065 |
| WDB | 108 | 0.0073634033 | 100.0 | 0.0010412644 | 49.286106 |
| LCO | 0 | | | | |
| RXLPL | 0 | | | | |
| WXLPL | 0 | | | | |
| RXGPL | 0 | | | | |
| WXGPL | 0 | | | | |
| RFS | 0 | | | | |
| WILPL | 0 | | | | |
| RIGPL | 0 | | | | |
| WIGPL | 0 | | | | |
| WFS | 0 | | | | |
| 75 | 0 | | | | |
| 76 | 0 | | | | |
| 77 | 0 | | | | |
| RFSL | 0 | | | | |
| WFSL | 0 | | | | |

In 'PRINC OPS', Opcode frequencies for 'Stack Ops' (12.227249)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| PUSH | 511092 | 40.300236 | 40.300236 | 4.92761 | 54.213715 |
| NILCKL | 276181 | 21.777212 | 62.077446 | 2.6627538 | 56.87647 |
| BNDCK | 137810 | 10.866488 | 72.94393 | 1.3286725 | 58.205143 |
| NILCK | 119508 | 9.423353 | 82.36729 | 1.1522168 | 59.35736 |
| EXCH | 90807 | 7.160244 | 89.52753 | 0.87550087 | 60.23286 |
| DUP | 61055 | 4.814262 | 94.34179 | 0.58865175 | 60.821514 |
| LINKB | 53643 | 4.229817 | 98.57161 | 0.5171902 | 61.338703 |
| POP | 18115 | 1.4283901 | 100.0 | 0.17465281 | 61.513355 |

In 'PRINC OPS', Opcode frequencies for 'ALU Ops' (10.762489)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| MUL | 269746 | 24.164597 | 24.164597 | 2.600712 | 64.11407 |
| ADD | 241286 | 21.61507 | 45.779667 | 2.3263195 | 66.440384 |
| SUB | 144918 | 12.982157 | 58.761826 | 1.3972032 | 67.837585 |
| INC | 126437 | 11.326577 | 70.0884 | 1.2190217 | 69.05661 |
| DADD | 93228 | 8.351624 | 78.440025 | 0.8988425 | 69.95545 |
| OR | 84359 | 7.5571136 | 85.99714 | 0.8133335 | 70.76878 |
| DUCOMP | 79424 | 7.1150227 | 93.11216 | 0.7657535 | 71.53454 |
| DBL | 22499 | 2.015523 | 95.127686 | 0.21692042 | 71.75146 |
| AND | 18124 | 1.6235983 | 96.75128 | 0.17473959 | 71.92619 |
| XOR | 16415 | 1.4705013 | 98.22179 | 0.15826255 | 72.08446 |
| DIV | 8134 | 0.7286663 | 98.950455 | 0.07842263 | 72.16288 |
| LDIV | 5428 | 0.48625526 | 99.43671 | 0.052333174 | 72.21521 |
| SHIFT | 3572 | 0.31998968 | 99.7567 | 0.03443885 | 72.24965 |
| DSUB | 2328 | 0.20854871 | 99.96525 | 0.02244503 | 72.272095 |
| DCOMP | 286 | 0.025620675 | 99.99087 | 0.0027574224 | 72.27485 |
| NEG | 102 | 0.009137444 | 100.00001 | 9.834164e-04 | 72.27583 |
| ADD01 | 0 | | | | |

In 'PRINC OPS', Opcode frequencies for 'Ld Immed' (10.53317)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| LIB | 476775 | 43.64069 | 43.64069 | 4.5967484 | 76.87258 |
| LI0 | 406245 | 37.184864 | 80.825554 | 3.916745 | 80.78933 |
| LIW | 129069 | 11.814085 | 92.63964 | 1.2443976 | 82.03373 |
| LI1 | 50230 | 4.5977073 | 97.23735 | 0.48428435 | 82.51801 |
| LI2 | 10177 | 0.9315323 | 98.168884 | 0.09811989 | 82.616135 |
| LI4 | 9734 | 0.8909832 | 99.05987 | 0.09384877 | 82.709984 |
| LI5 | 3760 | 0.34416442 | 99.40403 | 0.036251426 | 82.74624 |
| LIN1 | 3455 | 0.31624687 | 99.720276 | 0.03331082 | 82.77955 |
| LI3 | 2454 | 0.22462223 | 99.9449 | 0.02365984 | 82.80321 |
| LI6 | 602 | 0.05510292 | 100.0 | 0.005804085 | 82.80901 |
| LINI | 0 | | | | |
| LINB | 0 | | | | |

In 'PRINC OPS', Opcode frequencies for 'CondJumps' (8.424128)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| JZNEB | 314475 | 35.991375 | 35.991375 | 3.0319593 | 85.84097 |
| JZEQB | 197166 | 22.565468 | 58.556843 | 1.9009438 | 87.74191 |
| JLB | 105863 | 12.115923 | 70.67277 | 1.0206608 | 88.76257 |
| JGB | 59107 | 6.764742 | 77.43751 | 0.5698705 | 89.33244 |
| JULEB | 56203 | 6.432382 | 83.86989 | 0.541872 | 89.87431 |
| JULB | 41564 | 4.756962 | 88.62685 | 0.40073252 | 90.27505 |
| JEQB | 30005 | 3.4340448 | 92.06089 | 0.2892883 | 90.56434 |
| JGEB | 20465 | 2.3422005 | 94.40309 | 0.19730996 | 90.76165 |
| JNEB | 13564 | 1.5523873 | 95.95548 | 0.1307751 | 90.892426 |
| JNE7 | 11798 | 1.3502703 | 97.305756 | 0.11374849 | 91.00617 |
| JNE4 | 9684 | 1.1083249 | 98.41408 | 0.0933667 | 91.09954 |
| JUGEB | 2864 | 0.32778218 | 98.74186 | 0.027612786 | 91.12715 |
| JUGB | 2628 | 0.3007722 | 99.04263 | 0.025337431 | 91.15249 |
| JEQ5 | 1959 | 0.22420576 | 99.26684 | 0.018887378 | 91.17138 |
| JEQ4 | 1512 | 0.17304701 | 99.43989 | 0.014577701 | 91.18596 |
| JNE3 | 868 | 0.0993418 | 99.53923 | 0.00836868 | 91.19433 |
| JNE9 | 785 | 0.08984253 | 99.629074 | 0.007568449 | 91.2019 |
| JNE5 | 702 | 0.080343256 | 99.70942 | 0.006768218 | 91.208664 |
| JEQ7 | 697 | 0.07977101 | 99.78919 | 0.0067200127 | 91.215385 |
| JLEB | 609 | 0.06969949 | 99.858894 | 0.0058715734 | 91.22126 |
| JEQ3 | 428 | 0.048984203 | 99.907875 | 0.004126492 | 91.22539 |
| JNE6 | 405 | 0.04635188 | 99.95422 | 0.0039047413 | 91.229294 |
| JEQ8 | 284 | 0.032503538 | 99.986725 | 0.0027381396 | 91.23203 |
| JEQ9 | 96 | 0.0109871125 | 99.99771 | 9.255684e-04 | 91.232956 |
| JNE8 | 12 | 0.001373389 | 99.999084 | 1.1569605e-04 | 91.23307 |
| JEQ6 | 8 | 9.155926e-04 | 100.0 | 7.713069e-05 | 91.23315 |
| JEQ2 | 0 | | | | |
| JNE2 | 0 | | | | |

In 'PRINC OPS', Opcode frequencies for 'Xfers' (5.3067846)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RET | 252951 | 45.955997 | 45.955997 | 2.4387858 | 93.671936 |
| KFCB | 86379 | 15.693289 | 61.649284 | 0.83280907 | 94.504745 |
| SFC | 73761 | 13.400857 | 75.05014 | 0.71115465 | 95.2159 |
| LFC4 | 25896 | 4.704771 | 79.75491 | 0.24967206 | 95.46557 |
| LFC11 | 18720 | 3.4010391 | 83.15595 | 0.18048582 | 95.64606 |
| EFC5 | 15544 | 2.8240252 | 85.97998 | 0.14986494 | 95.79592 |
| LFCB | 15175 | 2.7569857 | 88.73697 | 0.14630729 | 95.94223 |
| LFC1 | 14563 | 2.6457977 | 91.38277 | 0.14040679 | 96.082634 |
| EFC1 | 8686 | 1.5780677 | 92.96083 | 0.08374464 | 96.16638 |
| LFC2 | 8195 | 1.488863 | 94.44969 | 0.07901075 | 96.24539 |
| LFC8 | 7332 | 1.3320737 | 95.78177 | 0.070690274 | 96.316086 |
| LFC3 | 6777 | 1.2312416 | 97.01301 | 0.06533934 | 96.381424 |
| LFC9 | 3046 | 0.55339565 | 97.56641 | 0.029367509 | 96.41079 |
| LFC14 | 2986 | 0.5424948 | 98.1089 | 0.028789032 | 96.439575 |
| EFC0 | 2964 | 0.5384979 | 98.6474 | 0.02857692 | 96.468155 |
| LFC5 | 2882 | 0.52360015 | 99.171 | 0.027786331 | 96.49594 |
| LFC16 | 876 | 0.15915118 | 99.33015 | 0.00844581 | 96.50439 |

| | | | | | |
|---|---|---|---|---|---|
| LLKB | 674 | 0.12245195 | 99.4526 | 0.0064982605 | 96.51089 |
| LFC10 | 606 | 0.11009774 | 99.5627 | 0.00584265 | 96.51673 |
| LFC13 | 511 | 0.0928382 | 99.65553 | 0.004926723 | 96.52166 |
| LFC12 | 457 | 0.083027506 | 99.73856 | 0.0044060907 | 96.52607 |
| EFC9 | 206 | 0.037425966 | 99.775986 | 0.0019861153 | 96.52805 |
| EFC8 | 202 | 0.03669925 | 99.81268 | 0.0019475498 | 96.53 |
| EFC2 | 186 | 0.033792377 | 99.84647 | 0.0017932885 | 96.53179 |
| EFC4 | 137 | 0.024890084 | 99.87136 | 0.001320863 | 96.53311 |
| EFC3 | 137 | 0.024890084 | 99.89625 | 0.001320863 | 96.53443 |
| EFC10 | 111 | 0.020166419 | 99.91641 | 0.0010701884 | 96.5355 |
| EFC11 | 111 | 0.020166419 | 99.93658 | 0.0010701884 | 96.53657 |
| EFC14 | 111 | 0.020166419 | 99.95674 | 0.0010701884 | 96.537636 |
| LFC6 | 100 | 0.018167944 | 99.97491 | 9.6413374e-04 | 96.5386 |
| LFC7 | 60 | 0.010900767 | 99.98581 | 5.7848024e-04 | 96.53918 |
| EFC15 | 56 | 0.010174049 | 99.99599 | 5.3991485e-04 | 96.53972 |
| EFC7 | 8 | 0.0014534355 | 99.997444 | 7.713069e-05 | 96.539795 |
| EFC6 | 7 | 0.0012717562 | 99.99872 | 6.748936e-05 | 96.53986 |
| EFC12 | 3 | 5.450383e-04 | 99.99926 | 2.8924012e-05 | 96.539894 |
| LFC15 | 2 | 3.6335888e-04 | 99.999626 | 1.9282673e-05 | 96.53992 |
| EFCB | 1 | 1.8167944e-04 | 99.99981 | 9.641336e-06 | 96.539925 |
| EFC13 | 1 | 1.8167944e-04 | 99.99999 | 9.641336e-06 | 96.53993 |
| PORTI | 0 | | | | |
| PORTO | 0 | | | | |

In 'PRINC OPS', Opcode frequencies for 'Jumps' (1.7548581)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| JB | 109355 | 60.080547 | 60.080547 | 1.0543283 | 97.59426 |
| JW | 37262 | 20.472052 | 80.5526 | 0.35925546 | 97.953514 |
| J2 | 21769 | 11.960069 | 92.512665 | 0.20988224 | 98.1634 |
| J3 | 7537 | 4.1408906 | 96.65356 | 0.07266675 | 98.23607 |
| JIW | 2125 | 1.1674926 | 97.82105 | 0.020487838 | 98.25655 |
| J9 | 1748 | 0.9603657 | 98.78142 | 0.016853057 | 98.27341 |
| J4 | 1152 | 0.63291836 | 99.41434 | 0.01110682 | 98.284515 |
| J7 | 890 | 0.48897333 | 99.90331 | 0.008580789 | 98.2931 |
| J5 | 158 | 0.08680651 | 99.99012 | 0.0015233312 | 98.294624 |
| J6 | 18 | 0.009889349 | 100.00001 | 1.7354406e-04 | 98.2948 |
| JIB | 0 | | | | |
| J8 | 0 | | | | |

In 'PRINC OPS', Opcode frequencies for 'Misc' (1.6629666)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| z377 | 104826 | 60.774685 | 60.774685 | 1.0106628 | 99.305466 |
| MISC | 22733 | 13.179849 | 73.95454 | 0.2191765 | 99.52464 |
| DESCB | 9762 | 5.6596885 | 79.61423 | 0.09411873 | 99.61876 |
| LSTF | 7079 | 4.104172 | 83.7184 | 0.06825102 | 99.68701 |
| DST | 7070 | 4.0989547 | 87.81735 | 0.06816425 | 99.75517 |
| FREE | 4316 | 2.5022757 | 90.319626 | 0.041612005 | 99.79678 |
| ALLOC | 4290 | 2.4872017 | 92.80682 | 0.041361332 | 99.83814 |
| BLT | 3958 | 2.2947187 | 95.10154 | 0.03816041 | 99.876305 |
| CATCH | 2824 | 1.6372628 | 96.7388 | 0.027227135 | 99.903534 |
| DWDC | 2370 | 1.3740485 | 98.11285 | 0.022849967 | 99.926384 |
| IWDC | 2370 | 1.3740485 | 99.48689 | 0.022849967 | 99.949234 |
| LP | 562 | 0.32582922 | 99.81272 | 0.0054184313 | 99.95465 |
| BLTC | 282 | 0.16349437 | 99.97622 | 0.0027188568 | 99.95737 |
| DESCBS | 26 | 0.015073949 | 99.991295 | 2.5067475e-04 | 99.95762 |
| BLTL | 14 | 0.008116741 | 99.99941 | 1.3497871e-04 | 99.957756 |
| LST | 1 | 5.797673e-04 | 99.99999 | 9.641336e-06 | 99.95776 |
| z176 | 0 | | | | |
| z177 | 0 | | | | |
| BLTCL | 0 | | | | |
| z271 | 0 | | | | |
| z272 | 0 | | | | |
| z273 | 0 | | | | |
| z274 | 0 | | | | |
| STOP | 0 | | | | |
| z275 | 0 | | | | |
| z276 | 0 | | | | |
| BITBLT | 0 | | | | |

| | |
|---|---|
| SIARTIO | 0 |
| JRAM | 0 |
| z277 | 0 |
| NOOP | 0 |
| z174 | 0 |
| z373 | 0 |
| WR | 0 |
| RR | 0 |
| BRK | 0 |
| z175 | 0 |

In 'PRINC OPS', Opcode frequencies for 'Processes' (0.042238693)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| MRE | 2454 | 56.01461 | 56.01461 | 0.02365984 | 99.98142 |
| MXW | 1919 | 43.802788 | 99.8174 | 0.018501725 | 99.99992 |
| ME | 4 | 0.09130336 | 99.9087 | 3.8565345e-05 | 99.99996 |
| MXD | 4 | 0.09130336 | 100.0 | 3.8565345e-05 | 100.0 |
| NOTIFY | 0 | | | | |
| BCAST | 0 | | | | |
| REQUEUE | 0 | | | | |

STATISTICS FOR 'LOCALS VS GLOBALS GROUP'

Instruction Frequencies by Group: LOCALS VS GLOBALS GROUP

| | | | |
|---|---|---|---|
| locals | 3556124 | 34.285786 | 34.285786 |
| other | 1445075 | 13.932455 | 48.21824 |
| AluInLG | 1116286 | 10.762489 | 58.98073 |
| LdImmedInLG | 1092501 | 10.53317 | 69.5139 |
| CondJumpsInLG | 873751 | 8.424128 | 77.93803 |
| addresses | 847576 | 8.171765 | 86.109795 |
| xfersInLG | 549746 | 5.300286 | 91.41008 |
| localsIndir | 489115 | 4.7157226 | 96.1258 |
| globals | 202664 | 1.9539518 | 98.07975 |
| JumpsInLG | 182014 | 1.7548581 | 99.83461 |
| globalsIndir | 17154 | 0.16538749 | 100.0 |

OPCODES WITHIN GROUPS OF LOCALS VS GLOBALS GROUP

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'locals' (34.285786)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| LLDB | 730510 | 20.54231 | 20.54231 | 7.0430927 | 7.0430927 |
| LL0 | 662410 | 18.627304 | 39.169617 | 6.3865175 | 13.42961 |
| SLDB | 533914 | 15.01393 | 54.183548 | 5.1476445 | 18.577255 |
| LL2 | 182944 | 5.144478 | 59.328026 | 1.7638247 | 20.34108 |
| LL1 | 161270 | 4.5349936 | 63.863018 | 1.5548583 | 21.895939 |
| LL3 | 154693 | 4.350045 | 68.213066 | 1.4914472 | 23.387386 |
| SL1 | 137125 | 3.8560243 | 72.06909 | 1.3220682 | 24.709454 |
| LL5 | 126408 | 3.5546567 | 75.62375 | 1.218742 | 25.928196 |
| PL0 | 118345 | 3.327921 | 78.95167 | 1.141004 | 27.0692 |
| SL0 | 117019 | 3.2906332 | 82.2423 | 1.1282195 | 28.19742 |
| SL5 | 114804 | 3.2283463 | 85.47065 | 1.106864 | 29.304283 |
| LADRB | 78552 | 2.208922 | 87.67957 | 0.75734625 | 30.06163 |
| SLB | 66245 | 1.8628428 | 89.54242 | 0.6386904 | 30.700321 |
| LL4 | 64520 | 1.814335 | 91.35676 | 0.62205906 | 31.32238 |
| SL4 | 61076 | 1.7174879 | 93.07425 | 0.58885427 | 31.911234 |
| LLB | 47482 | 1.3352178 | 94.40947 | 0.45778995 | 32.369022 |
| PL2 | 45334 | 1.274815 | 95.68429 | 0.43708034 | 32.806103 |
| SL2 | 43768 | 1.2307782 | 96.91507 | 0.421982 | 33.228085 |
| SL3 | 33532 | 0.9429367 | 97.85801 | 0.3232933 | 33.551376 |
| LL6 | 22048 | 0.62000084 | 98.47801 | 0.2125722 | 33.76395 |
| SL6 | 21704 | 0.61032743 | 99.08834 | 0.20925555 | 33.973206 |
| PL3 | 18356 | 0.51618 | 99.60452 | 0.17697639 | 34.15018 |
| PL1 | 9600 | 0.26995683 | 99.87448 | 0.09255683 | 34.242737 |
| LL7 | 2991 | 0.08410843 | 99.95859 | 0.028837237 | 34.271576 |
| SL7 | 1474 | 0.041449623 | 100.00004 | 0.01421133 | 34.285786 |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'other' (13.932455)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| PUSH | 511092 | 35.36785 | 35.36785 | 4.92761 | 39.213394 |
| NILCKL | 276181 | 19.111881 | 54.479733 | 2.6627538 | 41.87615 |
| BNDCK | 137810 | 9.53653 | 64.016266 | 1.3286725 | 43.204823 |
| NILCK | 119508 | 8.2700205 | 72.286285 | 1.1522168 | 44.35704 |
| z377 | 104826 | 7.254018 | 79.540306 | 1.0106628 | 45.367702 |
| EXCH | 90807 | 6.2838955 | 85.8242 | 0.87550087 | 46.243202 |
| DUP | 61055 | 4.2250404 | 90.04924 | 0.58865175 | 46.831856 |
| LINKB | 53643 | 3.7121255 | 93.76137 | 0.5171902 | 47.349045 |
| MISC | 22733 | 1.5731362 | 95.3345 | 0.2191765 | 47.568222 |
| POP | 18115 | 1.2535682 | 96.58807 | 0.17465281 | 47.742874 |
| DESCB | 9762 | 0.67553587 | 97.26361 | 0.09411873 | 47.836994 |
| LSTF | 7079 | 0.4898708 | 97.75348 | 0.06825102 | 47.905247 |
| DST | 7070 | 0.489248 | 98.24273 | 0.06816425 | 47.97341 |
| FREE | 4316 | 0.2986696 | 98.5414 | 0.041612005 | 48.015022 |
| ALLOC | 4290 | 0.29687042 | 98.838264 | 0.041361332 | 48.056385 |
| BLT | 3958 | 0.27389584 | 99.11216 | 0.03816041 | 48.094547 |
| CATCH | 2824 | 0.19542236 | 99.30758 | 0.027227135 | 48.121773 |
| MRE | 2454 | 0.16981817 | 99.477394 | 0.02365984 | 48.14543 |
| DWDC | 2370 | 0.16400533 | 99.6414 | 0.022849967 | 48.16828 |
| IWDC | 2370 | 0.16400533 | 99.80541 | 0.022849967 | 48.19113 |
| MXW | 1919 | 0.13279587 | 99.93821 | 0.018501725 | 48.209633 |
| LP | 562 | 0.038890717 | 99.9771 | 0.0054184313 | 48.21505 |
| BLTC | 282 | 0.019514559 | 99.99661 | 0.0027188568 | 48.21777 |
| DESCBS | 26 | 0.0017992146 | 99.99841 | 2.5067475e-04 | 48.21802 |
| BLTL | 14 | 9.688079e-04 | 99.99938 | 1.3497871e-04 | 48.218155 |
| MXD | 4 | 2.768022e-04 | 99.99966 | 3.8565345e-05 | 48.218193 |
| ME | 4 | 2.768022e-04 | 99.99993 | 3.8565345e-05 | 48.21823 |
| LST | 1 | 6.9200554e-05 | 100.0 | 9.641336e-06 | 48.218243 |
| NOTIFY | 0 | | | | |
| BCAST | 0 | | | | |
| REQUEUE | 0 | | | | |
| NOOP | 0 | | | | |
| z174 | 0 | | | | |
| BLTCL | 0 | | | | |
| z175 | 0 | | | | |

| | |
|---|---|
| z176 | 0 |
| z177 | 0 |
| z271 | 0 |
| SIOP | 0 |
| z272 | 0 |
| z273 | 0 |
| BITBLT | 0 |
| STARTIO | 0 |
| JRAM | 0 |
| z274 | 0 |
| z275 | 0 |
| z276 | 0 |
| z373 | 0 |
| WR | 0 |
| RR | 0 |
| BRK | 0 |
| z277 | 0 |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'AluInLG' (10.762489)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| MUL | 269746 | 24.164597 | 24.164597 | 2.600712 | 50.818954 |
| ADD | 241286 | 21.61507 | 45.779667 | 2.3263195 | 53.145275 |
| SUB | 144918 | 12.982157 | 58.761826 | 1.3972032 | 54.542477 |
| INC | 126437 | 11.326577 | 70.0884 | 1.2190217 | 55.761497 |
| DADD | 93228 | 8.351624 | 78.440025 | 0.8988425 | 56.66034 |
| OR | 84359 | 7.5571136 | 85.99714 | 0.8133335 | 57.47367 |
| DUCOMP | 79424 | 7.1150227 | 93.11216 | 0.7657535 | 58.239426 |
| DBL | 22499 | 2.015523 | 95.127686 | 0.21692042 | 58.456345 |
| AND | 18124 | 1.6235983 | 96.75128 | 0.17473959 | 58.631084 |
| XOR | 16415 | 1.4705013 | 98.22179 | 0.15826255 | 58.78935 |
| DIV | 8134 | 0.7286663 | 98.950455 | 0.07842263 | 58.86777 |
| LDIV | 5428 | 0.48625526 | 99.43671 | 0.052333174 | 58.920105 |
| SHIFT | 3572 | 0.31998968 | 99.7567 | 0.03443885 | 58.954544 |
| DSUB | 2328 | 0.20854871 | 99.96525 | 0.02244503 | 58.97699 |
| DCOMP | 286 | 0.025620675 | 99.99087 | 0.0027574224 | 58.979748 |
| NEG | 102 | 0.009137444 | 100.00001 | 9.834164e-04 | 58.980732 |
| ADD01 | 0 | | | | |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'LdImmedInLG' (10.53317)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| LIB | 476775 | 43.64069 | 43.64069 | 4.5967484 | 63.57748 |
| LI0 | 406245 | 37.184864 | 80.825554 | 3.916745 | 67.494225 |
| LIW | 129069 | 11.814085 | 92.63964 | 1.2443976 | 68.738625 |
| LI1 | 50230 | 4.5977073 | 97.23735 | 0.48428435 | 69.22291 |
| LI2 | 10177 | 0.9315323 | 98.168884 | 0.09811989 | 69.32103 |
| LI4 | 9734 | 0.8909832 | 99.05987 | 0.09384877 | 69.41488 |
| LI5 | 3760 | 0.34416442 | 99.40403 | 0.036251426 | 69.45113 |
| LIN1 | 3455 | 0.31624687 | 99.720276 | 0.03331082 | 69.48444 |
| LI3 | 2454 | 0.22462223 | 99.9449 | 0.02365984 | 69.5081 |
| LI6 | 602 | 0.05510292 | 100.0 | 0.005804085 | 69.51391 |
| LINI | 0 | | | | |
| LINB | 0 | | | | |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'CondJumpsInLG' (8.424128)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| JZNEB | 314475 | 35.991375 | 35.991375 | 3.0319593 | 72.54587 |
| JZEQB | 197166 | 22.565468 | 58.556843 | 1.9009438 | 74.44681 |
| JLB | 105863 | 12.115923 | 70.67277 | 1.0206608 | 75.46747 |
| JGB | 59107 | 6.764742 | 77.43751 | 0.5698705 | 76.03734 |
| JULEB | 56203 | 6.432382 | 83.86989 | 0.541872 | 76.57921 |
| JULB | 41564 | 4.756962 | 88.62685 | 0.40073252 | 76.97994 |
| JEQB | 30005 | 3.4340448 | 92.06089 | 0.2892883 | 77.26923 |
| JGEB | 20465 | 2.3422005 | 94.40309 | 0.19730996 | 77.466545 |
| JNEB | 13564 | 1.5523873 | 95.95548 | 0.1307751 | 77.59732 |

| | | | | | |
|---|---|---|---|---|---|
| JNE7 | 11798 | 1.3502703 | 97.305756 | 0.11374849 | 77.71107 |
| JNE4 | 9684 | 1.1083249 | 98.41408 | 0.0933667 | 77.804436 |
| JUGEB | 2864 | 0.32778218 | 98.74186 | 0.027612786 | 77.83205 |
| JUGB | 2628 | 0.3007722 | 99.04263 | 0.025337431 | 77.85738 |
| JEQ5 | 1959 | 0.22420576 | 99.26684 | 0.018887378 | 77.876274 |
| JEQ4 | 1512 | 0.17304701 | 99.43989 | 0.014577701 | 77.890854 |
| JNE3 | 868 | 0.0993418 | 99.53923 | 0.00836868 | 77.89922 |
| JNE9 | 785 | 0.08984253 | 99.629074 | 0.007568449 | 77.90679 |
| JNE5 | 702 | 0.080343256 | 99.70942 | 0.006768218 | 77.91356 |
| JEQ7 | 697 | 0.07977101 | 99.78919 | 0.0067200127 | 77.92028 |
| JLEB | 609 | 0.06969949 | 99.858894 | 0.0058715734 | 77.926155 |
| JEQ3 | 428 | 0.048984203 | 99.907875 | 0.004126492 | 77.93028 |
| JNE6 | 405 | 0.04635188 | 99.95422 | 0.0039047413 | 77.93419 |
| JEQ8 | 284 | 0.032503538 | 99.986725 | 0.0027381396 | 77.93693 |
| JEQ9 | 96 | 0.0109871125 | 99.99771 | 9.255684e-04 | 77.93785 |
| JNE8 | 12 | 0.001373389 | 99.999084 | 1.1569605e-04 | 77.937965 |
| JEQ6 | 8 | 9.155926e-04 | 100.0 | 7.713069e-05 | 77.93804 |
| JEQ2 | 0 | | | | |
| JNE2 | 0 | | | | |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'addresses' (8.171765)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| R0 | 190646 | 22.493086 | 22.493086 | 1.8380823 | 79.77612 |
| RDBL | 152282 | 17.966766 | 40.459854 | 1.468202 | 81.24432 |
| RSTR | 141716 | 16.720152 | 57.180008 | 1.3663316 | 82.61066 |
| RF | 114133 | 13.465813 | 70.64582 | 1.1003947 | 83.71105 |
| WSDB | 32621 | 3.8487406 | 74.49456 | 0.31451 | 84.02556 |
| WDBL | 32349 | 3.816649 | 78.31121 | 0.3118876 | 84.33745 |
| RFL | 29440 | 3.473435 | 81.784645 | 0.28384094 | 84.62129 |
| RSTRL | 26954 | 3.1801279 | 84.964775 | 0.25987258 | 84.881165 |
| WFL | 25939 | 3.0603745 | 88.02515 | 0.25008664 | 85.13125 |
| RD0 | 22434 | 2.6468422 | 90.67199 | 0.21629376 | 85.34754 |
| RDB | 18369 | 2.1672392 | 92.839226 | 0.17710172 | 85.52464 |
| WSTR | 12322 | 1.453793 | 94.29302 | 0.118800545 | 85.64344 |
| WD0 | 12191 | 1.4383371 | 95.73136 | 0.11753752 | 85.76098 |
| WSTRL | 5858 | 0.6911474 | 96.42251 | 0.056478953 | 85.81746 |
| RBL | 4158 | 0.49057546 | 96.913086 | 0.040088682 | 85.85755 |
| W0 | 3920 | 0.46249537 | 97.37558 | 0.0379404 | 85.89535 |
| W1 | 3744 | 0.4417303 | 97.81731 | 0.036097167 | 85.93144 |
| WBL | 3095 | 0.365159 | 98.182465 | 0.029839935 | 85.96128 |
| R1 | 2742 | 0.32351084 | 98.505974 | 0.026436543 | 85.98772 |
| R4 | 2704 | 0.31902742 | 98.825005 | 0.026070175 | 86.01379 |
| WSF | 2396 | 0.2826885 | 99.1077 | 0.02310064 | 86.03689 |
| R3 | 2368 | 0.27938497 | 99.387085 | 0.022830682 | 86.059715 |
| RB | 1212 | 0.14299603 | 99.53008 | 0.0116853 | 86.0714 |
| WB | 889 | 0.104887354 | 99.63497 | 0.008571148 | 86.07997 |
| WSB | 714 | 0.08424024 | 99.719215 | 0.0068839145 | 86.08685 |
| LLKB | 674 | 0.07952089 | 99.79874 | 0.0064982605 | 86.09335 |
| WF | 642 | 0.075745416 | 99.87448 | 0.006189738 | 86.09954 |
| R2 | 362 | 0.042710037 | 99.91719 | 0.0034901638 | 86.10303 |
| WS0 | 302 | 0.035631025 | 99.95282 | 0.0029116836 | 86.10594 |
| RFC | 150 | 0.017697527 | 99.97052 | 0.0014462005 | 86.10739 |
| W2 | 142 | 0.01675366 | 99.987274 | 0.0013690698 | 86.10876 |
| WDB | 108 | 0.01274222 | 100.000015 | 0.0010412644 | 86.109795 |
| 76 | 0 | | | | |
| RFS | 0 | | | | |
| WFS | 0 | | | | |
| 77 | 0 | | | | |
| LC0 | 0 | | | | |
| RFSL | 0 | | | | |
| WFSL | 0 | | | | |
| 75 | 0 | | | | |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'xfersInLG' (5.300286)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RET | 252951 | 46.01234 | 46.01234 | 2.4387858 | 88.548584 |
| KFCB | 86379 | 15.712529 | 61.72487 | 0.83280907 | 89.38139 |
| SFC | 73761 | 13.417287 | 75.14216 | 0.71115465 | 90.092545 |

| | | | | | |
|---|---|---|---|---|---|
| LFC4 | 25896 | 4.710539 | 79.8527 | 0.24967206 | 90.34222 |
| LFC11 | 18720 | 3.4052088 | 83.25791 | 0.18048582 | 90.522705 |
| EFC5 | 15544 | 2.8274875 | 86.085396 | 0.14986494 | 90.67257 |
| LFCB | 15175 | 2.7603655 | 88.845764 | 0.14630729 | 90.81888 |
| LFC1 | 14563 | 2.6490417 | 91.494804 | 0.14040679 | 90.95928 |
| EFC1 | 8686 | 1.5800023 | 93.07481 | 0.08374464 | 91.04303 |
| LFC2 | 8195 | 1.4906884 | 94.5655 | 0.07901075 | 91.12204 |
| LFC8 | 7332 | 1.3337069 | 95.89921 | 0.070690274 | 91.19273 |
| LFC3 | 6777 | 1.2327511 | 97.13196 | 0.06533934 | 91.25807 |
| LFC9 | 3046 | 0.55407405 | 97.686035 | 0.029367509 | 91.28744 |
| LFC14 | 2986 | 0.54315996 | 98.229195 | 0.028789032 | 91.31622 |
| EFC0 | 2964 | 0.5391581 | 98.76836 | 0.02857692 | 91.3448 |
| LFC5 | 2882 | 0.5242421 | 99.292595 | 0.027786331 | 91.37259 |
| LFC16 | 876 | 0.15934632 | 99.45194 | 0.00844581 | 91.381035 |
| LFC10 | 606 | 0.11023272 | 99.56217 | 0.00584265 | 91.38688 |
| LFC13 | 511 | 0.09295202 | 99.65512 | 0.004926723 | 91.39181 |
| LFC12 | 457 | 0.0831293 | 99.73825 | 0.0044060907 | 91.39622 |
| EFC9 | 206 | 0.037471848 | 99.77573 | 0.0019861153 | 91.3982 |
| EFC8 | 202 | 0.03674424 | 99.81247 | 0.0019475498 | 91.40015 |
| EFC2 | 186 | 0.03383381 | 99.846306 | 0.0017932885 | 91.40194 |
| EFC3 | 137 | 0.0249206 | 99.87122 | 0.001320863 | 91.40326 |
| EFC4 | 137 | 0.0249206 | 99.89614 | 0.001320863 | 91.40458 |
| EFC14 | 111 | 0.020191145 | 99.91633 | 0.0010701884 | 91.40565 |
| EFC10 | 111 | 0.020191145 | 99.936516 | 0.0010701884 | 91.406715 |
| EFC11 | 111 | 0.020191145 | 99.9567 | 0.0010701884 | 91.40778 |
| LFC6 | 100 | 0.018190218 | 99.97489 | 9.6413374e-04 | 91.408745 |
| LFC7 | 60 | 0.010914131 | 99.98581 | 5.7848024e-04 | 91.409325 |
| EFC15 | 56 | 0.010186522 | 99.995995 | 5.3991485e-04 | 91.40987 |
| EFC7 | 8 | 0.0014552175 | 99.99745 | 7.713069e-05 | 91.40994 |
| EFC6 | 7 | 0.0012733152 | 99.998726 | 6.748936e-05 | 91.41001 |
| EFC12 | 3 | 5.4570656e-04 | 99.999275 | 2.8924012e-05 | 91.41004 |
| LFC15 | 2 | 3.6380436e-04 | 99.99964 | 1.9282673e-05 | 91.410065 |
| EFC13 | 1 | 1.8190218e-04 | 99.999825 | 9.641336e-06 | 91.41007 |
| EFCB | 1 | 1.8190218e-04 | 100.00001 | 9.641336e-06 | 91.41008 |
| PORTI | 0 | | | | |
| PORTO | 0 | | | | |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'localsIndir' (4.7157226)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RILP | 322109 | 65.85548 | 65.85548 | 3.1055613 | 94.51564 |
| WILP | 119595 | 24.451305 | 90.30678 | 1.1530557 | 95.66869 |
| RIL0 | 25060 | 5.1235394 | 95.43032 | 0.24161191 | 95.91031 |
| RXLP | 21395 | 4.374227 | 99.80455 | 0.2062764 | 96.116585 |
| WXLP | 662 | 0.13534648 | 99.939896 | 0.0063825645 | 96.12297 |
| RILPL | 294 | 0.060108566 | 100.00001 | 0.0028345528 | 96.12581 |
| WXLPL | 0 | | | | |
| RXLPL | 0 | | | | |
| WILPL | 0 | | | | |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'globals' (1.9539518)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| LGDB | 51178 | 25.252634 | 25.252634 | 0.49342432 | 96.61923 |
| LGB | 40880 | 20.171318 | 45.42395 | 0.39413786 | 97.01337 |
| GADRB | 34990 | 17.26503 | 62.68898 | 0.33735037 | 97.350716 |
| LG1 | 15664 | 7.729049 | 70.41803 | 0.1510219 | 97.50174 |
| LG2 | 13340 | 6.5823236 | 77.00035 | 0.12861543 | 97.630356 |
| LG4 | 12694 | 6.263569 | 83.263916 | 0.12238712 | 97.75275 |
| SGB | 10182 | 5.0240793 | 88.287994 | 0.09816809 | 97.850914 |
| LG0 | 7286 | 3.595113 | 91.88311 | 0.07024678 | 97.92116 |
| SGDB | 7082 | 3.494454 | 95.37756 | 0.06827994 | 97.98944 |
| LG3 | 4150 | 2.0477242 | 97.425285 | 0.04001155 | 98.02945 |
| LG5 | 3874 | 1.9115382 | 99.33682 | 0.037350538 | 98.0668 |
| LG6 | 906 | 0.44704537 | 99.78387 | 0.00873505 | 98.07554 |
| SG3 | 224 | 0.110527766 | 99.894394 | 0.0021596594 | 98.0777 |
| LG7 | 148 | 0.07302728 | 99.96742 | 0.0014269176 | 98.079124 |
| SG0 | 48 | 0.023684523 | 99.991104 | 4.627842e-04 | 98.07959 |
| SG1 | 10 | 0.0049342756 | 99.99604 | 9.6413364e-05 | 98.07969 |
| SG2 | 8 | 0.00394742 | 99.999985 | 7.713069e-05 | 98.079765 |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'JumpsInLG' (1.7548581)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| JB | 109355 | 60.080547 | 60.080547 | 1.0543283 | 99.134094 |
| JW | 37262 | 20.472052 | 80.5526 | 0.35925546 | 99.49335 |
| J2 | 21769 | 11.960069 | 92.512665 | 0.20988224 | 99.70323 |
| J3 | 7537 | 4.1408906 | 96.65356 | 0.07266675 | 99.7759 |
| JIW | 2125 | 1.1674926 | 97.82105 | 0.020487838 | 99.79639 |
| J9 | 1748 | 0.9603657 | 98.78142 | 0.016853057 | 99.81324 |
| J4 | 1152 | 0.63291836 | 99.41434 | 0.01110682 | 99.82435 |
| J7 | 890 | 0.48897333 | 99.90331 | 0.008580789 | 99.83293 |
| J5 | 158 | 0.08680651 | 99.99012 | 0.0015233312 | 99.83446 |
| J6 | 18 | 0.009889349 | 100.00001 | 1.7354406e-04 | 99.83463 |
| JIB | 0 | | | | |
| J8 | 0 | | | | |

In 'LOCALS VS GLOBALS GROUP', Opcode frequencies for 'globalsIndir' (0.16538749)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RIGP | 17154 | 100.0 | 100.0 | 0.16538749 | 100.00002 |
| RXGPL | 0 | | | | |
| WXGPL | 0 | | | | |
| RIGPL | 0 | | | | |
| WIGPL | 0 | | | | |

STATISTICS FOR 'MEMORY: LOADS VS STORES'

Instruction Frequencies by Group: MEMORY: LOADS VS STORES

| | | | |
|---|---|---|---|
| loads | 3401078 | 32.79094 | 32.79094 |
| ldstOtherStackAlu | 2331416 | 22.477966 | 55.268906 |
| stores | 1597339 | 15.400483 | 70.66939 |
| ldstOtherImmed | 1092501 | 10.53317 | 81.20256 |
| ldstOtherJumps | 1055765 | 10.178986 | 91.381546 |
| ldstOtherXfers | 549746 | 5.300286 | 96.68183 |
| ldstOther | 344161 | 3.318172 | 100.0 |

OPCODES WITHIN GROUPS OF MEMORY: LOADS VS STORES

In 'MEMORY: LOADS VS STORES', Opcode frequencies for 'loads' (32.79094)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| LLDB | 730510 | 21.478779 | 21.478779 | 7.0430927 | 7.0430927 |
| LL0 | 662410 | 19.47647 | 40.95525 | 6.3865175 | 13.42961 |
| RILP | 322109 | 9.470792 | 50.42604 | 3.1055613 | 16.535172 |
| R0 | 190646 | 5.6054583 | 56.031498 | 1.8380823 | 18.373253 |
| LL2 | 182944 | 5.379 | 61.4105 | 1.7638247 | 20.137077 |
| LL1 | 161270 | 4.741732 | 66.15223 | 1.5548583 | 21.691936 |
| LL3 | 154693 | 4.548352 | 70.700584 | 1.4914472 | 23.183384 |
| RDBL | 152282 | 4.477463 | 75.17805 | 1.468202 | 24.651587 |
| RSTR | 141716 | 4.166796 | 79.34484 | 1.3663316 | 26.017918 |
| LL5 | 126408 | 3.716704 | 83.06155 | 1.218742 | 27.23666 |
| RF | 114133 | 3.3557887 | 86.417336 | 1.1003947 | 28.337055 |
| LL4 | 64520 | 1.8970456 | 88.314384 | 0.62205906 | 28.959114 |
| LGDB | 51178 | 1.5047583 | 89.819145 | 0.49342432 | 29.452538 |
| LLB | 47482 | 1.3960868 | 91.21523 | 0.45778995 | 29.910328 |
| LGB | 40880 | 1.2019718 | 92.417206 | 0.39413786 | 30.304466 |
| RFL | 29440 | 0.8656079 | 93.282814 | 0.28384094 | 30.588306 |
| RSTRL | 26954 | 0.7925134 | 94.075325 | 0.25987258 | 30.848179 |
| RIL0 | 25060 | 0.7368252 | 94.81215 | 0.24161191 | 31.08979 |
| RD0 | 22434 | 0.6596144 | 95.47176 | 0.21629376 | 31.306084 |
| LL6 | 22048 | 0.6482651 | 96.120026 | 0.2125722 | 31.518656 |
| RXLP | 21395 | 0.6290652 | 96.74909 | 0.2062764 | 31.724932 |
| RDB | 18369 | 0.54009347 | 97.289185 | 0.17710172 | 31.902033 |
| RIGP | 17154 | 0.5043695 | 97.79356 | 0.16538749 | 32.06742 |
| LG1 | 15664 | 0.4605599 | 98.25412 | 0.1510219 | 32.21844 |
| LG2 | 13340 | 0.3922286 | 98.64635 | 0.12861543 | 32.347057 |
| LG4 | 12694 | 0.3732346 | 99.019585 | 0.12238712 | 32.469444 |
| LG0 | 7286 | 0.2142262 | 99.23381 | 0.07024678 | 32.539692 |
| RBL | 4158 | 0.12225535 | 99.356064 | 0.040088682 | 32.57978 |
| LG3 | 4150 | 0.12202014 | 99.47808 | 0.04001155 | 32.619793 |
| LG5 | 3874 | 0.11390506 | 99.59199 | 0.037350538 | 32.657143 |
| LL7 | 2991 | 0.087942705 | 99.67993 | 0.028837237 | 32.68598 |
| R1 | 2742 | 0.08062149 | 99.76055 | 0.026436543 | 32.712418 |
| R4 | 2704 | 0.0795042 | 99.84006 | 0.026070175 | 32.738487 |
| R3 | 2368 | 0.06962499 | 99.90968 | 0.022830682 | 32.76132 |
| RB | 1212 | 0.035635762 | 99.94532 | 0.0116853 | 32.773003 |
| LG6 | 906 | 0.026638615 | 99.97196 | 0.00873505 | 32.78174 |
| R2 | 362 | 0.010643684 | 99.982605 | 0.0034901638 | 32.78523 |
| RILPL | 294 | 0.008644319 | 99.99125 | 0.0028345528 | 32.788063 |
| RFC | 150 | 0.0044103665 | 99.99566 | 0.0014462005 | 32.78951 |
| LG7 | 148 | 0.0043515615 | 100.00001 | 0.0014269176 | 32.790936 |
| RFS | 0 | | | | |
| RIGPL | 0 | | | | |
| RXLPL | 0 | | | | |
| RXGPL | 0 | | | | |
| RFSL | 0 | | | | |

In 'MEMORY: LOADS VS STORES', Opcode frequencies for 'ldstOtherStackAlu' (22.477966)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| PUSH | 511092 | 21.921957 | 21.921957 | 4.92761 | 37.718544 |
| NILCKL | 276181 | 11.846063 | 33.76802 | 2.6627538 | 40.381298 |
| MUL | 269746 | 11.57005 | 45.33807 | 2.600712 | 42.98201 |
| ADD | 241286 | 10.349333 | 55.6874 | 2.3263195 | 45.30833 |
| SUB | 144918 | 6.215879 | 61.90328 | 1.3972032 | 46.705532 |
| BNDCK | 137810 | 5.9110003 | 67.81428 | 1.3286725 | 48.034206 |
| INC | 126437 | 5.423185 | 73.237465 | 1.2190217 | 49.253227 |
| NILCK | 119508 | 5.125983 | 78.36345 | 1.1522168 | 50.405445 |
| DADD | 93228 | 3.9987717 | 82.36222 | 0.8988425 | 51.304287 |
| EXCH | 90807 | 3.8949291 | 86.25715 | 0.87550087 | 52.179787 |
| OR | 84359 | 3.6183589 | 89.87551 | 0.8133335 | 52.99312 |
| DUCOMP | 79424 | 3.406685 | 93.282196 | 0.7657535 | 53.758873 |
| DUP | 61055 | 2.6187947 | 95.90099 | 0.58865175 | 54.347527 |
| DBL | 22499 | 0.9650358 | 96.86603 | 0.21692042 | 54.564445 |
| AND | 18124 | 0.77738166 | 97.64341 | 0.17473959 | 54.739185 |

| | | | | | |
|---|---|---|---|---|---|
| POP | 18115 | 0.7769956 | 98.4204 | 0.17465281 | 54.913837 |
| XOR | 16415 | 0.7040786 | 99.12448 | 0.15826255 | 55.0721 |
| DIV | 8134 | 0.3488867 | 99.473366 | 0.07842263 | 55.150524 |
| LDIV | 5428 | 0.23281989 | 99.706184 | 0.052333174 | 55.202858 |
| SHIFT | 3572 | 0.1532116 | 99.8594 | 0.03443885 | 55.237297 |
| DSUB | 2328 | 0.09985349 | 99.95925 | 0.02244503 | 55.259743 |
| LP | 562 | 0.024105523 | 99.98336 | 0.0054184313 | 55.26516 |
| DCOMP | 286 | 0.012267222 | 99.99563 | 0.0027574224 | 55.267918 |
| NEG | 102 | 0.0043750234 | 100.0 | 9.834164e-04 | 55.2689 |
| ADD01 | 0 | | | | |

In 'MEMORY: LOADS VS STORES', Opcode frequencies for 'stores' (15.400483)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| SLDB | 533914 | 33.425217 | 33.425217 | 5.1476445 | 60.416546 |
| SL1 | 137125 | 8.58459 | 42.009808 | 1.3220682 | 61.738613 |
| WILP | 119595 | 7.4871397 | 49.49695 | 1.1530557 | 62.89167 |
| PL0 | 118345 | 7.408884 | 56.90583 | 1.141004 | 64.03268 |
| SL0 | 117019 | 7.3258715 | 64.231705 | 1.1282195 | 65.1609 |
| SL5 | 114804 | 7.1872034 | 71.41891 | 1.106864 | 66.26776 |
| SLB | 66245 | 4.14721 | 75.56612 | 0.6386904 | 66.90645 |
| SL4 | 61076 | 3.8236094 | 79.389725 | 0.58885427 | 67.4953 |
| PL2 | 45334 | 2.8380952 | 82.22782 | 0.43708034 | 67.93238 |
| SL2 | 43768 | 2.740057 | 84.96788 | 0.421982 | 68.35436 |
| SL3 | 33532 | 2.0992413 | 87.06712 | 0.3232933 | 68.67766 |
| WSDB | 32621 | 2.042209 | 89.10933 | 0.31451 | 68.992165 |
| WDBL | 32349 | 2.0251806 | 91.13451 | 0.3118876 | 69.304054 |
| WFL | 25939 | 1.6238883 | 92.75839 | 0.25008664 | 69.55414 |
| SL6 | 21704 | 1.3587598 | 94.11715 | 0.20925555 | 69.7634 |
| PL3 | 18356 | 1.1491611 | 95.26631 | 0.17697639 | 69.94038 |
| WSTR | 12322 | 0.771408 | 96.03772 | 0.118800545 | 70.05917 |
| WD0 | 12191 | 0.76320677 | 96.80093 | 0.11753752 | 70.17671 |
| SGB | 10182 | 0.63743515 | 97.43836 | 0.09816809 | 70.27488 |
| PL1 | 9600 | 0.60099955 | 98.03936 | 0.09255683 | 70.36744 |
| SGDB | 7082 | 0.44336233 | 98.48272 | 0.06827994 | 70.43572 |
| WSTRL | 5858 | 0.36673493 | 98.84946 | 0.056478953 | 70.4922 |
| W0 | 3920 | 0.24540815 | 99.094864 | 0.03779404 | 70.53 |
| W1 | 3744 | 0.2343898 | 99.329254 | 0.036097167 | 70.56609 |
| WBL | 3095 | 0.19375975 | 99.52301 | 0.029839935 | 70.59593 |
| WSF | 2396 | 0.14999948 | 99.67301 | 0.02310064 | 70.61903 |
| SL7 | 1474 | 0.09227847 | 99.76529 | 0.01421133 | 70.63325 |
| WB | 889 | 0.05565506 | 99.820946 | 0.008571148 | 70.641815 |
| WSB | 714 | 0.04469934 | 99.86565 | 0.0068839145 | 70.6487 |
| WXLP | 662 | 0.04144393 | 99.90709 | 0.0063825645 | 70.65508 |
| WF | 642 | 0.040191846 | 99.94728 | 0.006189738 | 70.66127 |
| WS0 | 302 | 0.018906445 | 99.96619 | 0.0029116836 | 70.664185 |
| SG3 | 224 | 0.014023322 | 99.98021 | 0.0021596594 | 70.66634 |
| W2 | 142 | 0.008889786 | 99.9891 | 0.0013690698 | 70.66771 |
| WDB | 108 | 0.006761245 | 99.99586 | 0.0010412644 | 70.66875 |
| SG0 | 48 | 0.0030049977 | 99.99886 | 4.627842e-04 | 70.66921 |
| SG1 | 10 | 6.260412e-04 | 99.99949 | 9.6413364e-05 | 70.66931 |
| SG2 | 8 | 5.0083294e-04 | 99.99999 | 7.713069e-05 | 70.66939 |
| WIGPL | 0 | | | | |
| WFS | 0 | | | | |
| WXLPL | 0 | | | | |
| WFSL | 0 | | | | |
| WXGPL | 0 | | | | |
| WILPL | 0 | | | | |

In 'MEMORY: LOADS VS STORES', Opcode frequencies for 'ldstOtherImmed' (10.53317)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| LIB | 476775 | 43.64069 | 43.64069 | 4.5967484 | 75.266136 |
| LI0 | 406245 | 37.184864 | 80.825554 | 3.916745 | 79.182884 |
| LIW | 129069 | 11.814085 | 92.63964 | 1.2443976 | 80.427284 |
| LI1 | 50230 | 4.5977073 | 97.23735 | 0.48428435 | 80.91157 |
| LI2 | 10177 | 0.9315323 | 98.168884 | 0.09811989 | 81.00969 |
| LI4 | 9734 | 0.8909832 | 99.05987 | 0.09384877 | 81.10354 |
| LI5 | 3760 | 0.34416442 | 99.40403 | 0.036251426 | 81.13979 |
| LIN1 | 3455 | 0.31624687 | 99.720276 | 0.03331082 | 81.1731 |

| | | | | | |
|---|---|---|---|---|---|
| LI3 | 2454 | 0.22462223 | 99.9449 | 0.02365984 | 81.19676 |
| LI6 | 602 | 0.05510292 | 100.0 | 0.005804085 | 81.20257 |
| LINI | 0 | | | | |
| LINB | 0 | | | | |
| LCO | 0 | | | | |

In 'MEMORY: LOADS VS STORES', Opcode frequencies for 'ldstOtherJumps' (10.178986)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| JZNEB | 314475 | 29.786459 | 29.786459 | 3.0319593 | 84.23453 |
| JZEQB | 197166 | 18.675179 | 48.46164 | 1.9009438 | 86.13547 |
| JB | 109355 | 10.357893 | 58.819534 | 1.0543283 | 87.1898 |
| JLB | 105863 | 10.027137 | 68.84667 | 1.0206608 | 88.21046 |
| JGB | 59107 | 5.5985 | 74.445175 | 0.5698705 | 88.78033 |
| JULEB | 56203 | 5.323438 | 79.768616 | 0.541872 | 89.3222 |
| JULB | 41564 | 3.936861 | 83.705475 | 0.40073252 | 89.72293 |
| JW | 37262 | 3.529384 | 87.234856 | 0.35925546 | 90.082184 |
| JEQB | 30005 | 2.842015 | 90.07687 | 0.2892883 | 90.371475 |
| J2 | 21769 | 2.0619173 | 92.138794 | 0.20988224 | 90.58136 |
| JGEB | 20465 | 1.938405 | 94.0772 | 0.19730996 | 90.77867 |
| JNEB | 13564 | 1.2847556 | 95.36195 | 0.1307751 | 90.90945 |
| JNE7 | 11798 | 1.1174835 | 96.47944 | 0.11374849 | 91.02319 |
| JNE4 | 9684 | 0.9172496 | 97.39669 | 0.0933667 | 91.11656 |
| J3 | 7537 | 0.7138899 | 98.11058 | 0.07266675 | 91.18923 |
| JUGEB | 2864 | 0.27127252 | 98.38185 | 0.027612786 | 91.21684 |
| JUGB | 2628 | 0.24891903 | 98.63077 | 0.025337431 | 91.24218 |
| JIW | 2125 | 0.20127585 | 98.83205 | 0.020487838 | 91.262665 |
| JEQ5 | 1959 | 0.18555265 | 99.0176 | 0.018887378 | 91.281555 |
| J9 | 1748 | 0.16556715 | 99.18317 | 0.016853057 | 91.29841 |
| JEQ4 | 1512 | 0.14321369 | 99.32638 | 0.014577701 | 91.31299 |
| J4 | 1152 | 0.109115195 | 99.43549 | 0.01110682 | 91.3241 |
| J7 | 890 | 0.08429907 | 99.51979 | 0.008580789 | 91.33268 |
| JNE3 | 868 | 0.08221526 | 99.602005 | 0.00836868 | 91.34105 |
| JNE9 | 785 | 0.07435367 | 99.67636 | 0.007568449 | 91.34862 |
| JNE5 | 702 | 0.066492076 | 99.74285 | 0.006768218 | 91.355385 |
| JEQ7 | 697 | 0.06601848 | 99.80887 | 0.0067200127 | 91.36211 |
| JLEB | 609 | 0.057683296 | 99.866554 | 0.0058715734 | 91.36798 |
| JEQ3 | 428 | 0.040539322 | 99.9071 | 0.004126492 | 91.37211 |
| JNE6 | 405 | 0.03836081 | 99.94546 | 0.0039047413 | 91.376015 |
| JEQ8 | 284 | 0.026899929 | 99.97236 | 0.0027381396 | 91.37875 |
| J5 | 158 | 0.014965451 | 99.98733 | 0.0015233312 | 91.38028 |
| JEQ9 | 96 | 0.009092933 | 99.99642 | 9.255684e-04 | 91.3812 |
| J6 | 18 | 0.0017049251 | 99.99812 | 1.7354406e-04 | 91.38138 |
| JNE8 | 12 | 0.0011366166 | 99.99926 | 1.1569605e-04 | 91.38149 |
| JEQ6 | 8 | 7.577443e-04 | 100.000015 | 7.713069e-05 | 91.38157 |
| JEQ2 | 0 | | | | |
| JNE2 | 0 | | | | |
| JIB | 0 | | | | |
| J8 | 0 | | | | |

In 'MEMORY: LOADS VS STORES', Opcode frequencies for 'ldstOtherXfers' (5.300286)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RET | 252951 | 46.01234 | 46.01234 | 2.4387858 | 93.82036 |
| KFCB | 86379 | 15.712529 | 61.72487 | 0.83280907 | 94.65317 |
| SFC | 73761 | 13.417287 | 75.14216 | 0.71115465 | 95.36432 |
| LFC4 | 25896 | 4.710539 | 79.8527 | 0.24967206 | 95.61399 |
| LFC11 | 18720 | 3.4052088 | 83.25791 | 0.18048582 | 95.79448 |
| EFC5 | 15544 | 2.8274875 | 86.085396 | 0.14986494 | 95.94434 |
| LFCB | 15175 | 2.7603655 | 88.845764 | 0.14630729 | 96.09065 |
| LFC1 | 14563 | 2.6490417 | 91.494804 | 0.14040679 | 96.23106 |
| EFC1 | 8686 | 1.5800023 | 93.07481 | 0.08374464 | 96.314804 |
| LFC2 | 8195 | 1.4906884 | 94.5655 | 0.07901075 | 96.393814 |
| LFC8 | 7332 | 1.3337069 | 95.89921 | 0.070690274 | 96.46451 |
| LFC3 | 6777 | 1.2327511 | 97.13196 | 0.06533934 | 96.52985 |
| LFC9 | 3046 | 0.55407405 | 97.686035 | 0.029367509 | 96.55921 |
| LFC14 | 2986 | 0.54315996 | 98.229195 | 0.028789032 | 96.588 |
| EFC0 | 2964 | 0.5391581 | 98.76836 | 0.02857692 | 96.61658 |
| LFC5 | 2882 | 0.5242421 | 99.292595 | 0.027786331 | 96.64436 |
| LFC16 | 876 | 0.15934632 | 99.45194 | 0.00844581 | 96.65281 |

| | | | | | |
|---|---|---|---|---|---|
| LFC10 | 606 | 0.11023272 | 99.56217 | 0.00584265 | 96.65865 |
| LFC13 | 511 | 0.09295202 | 99.65512 | 0.004926723 | 96.66358 |
| LFC12 | 457 | 0.0831293 | 99.73825 | 0.0044060907 | 96.66799 |
| LFC9 | 206 | 0.037471848 | 99.77573 | 0.0019861153 | 96.669975 |
| LFC8 | 202 | 0.03674424 | 99.81247 | 0.0019475498 | 96.67192 |
| EFC2 | 186 | 0.03383381 | 99.846306 | 0.0017932885 | 96.67371 |
| EFC3 | 137 | 0.0249206 | 99.87122 | 0.001320863 | 96.67503 |
| EFC4 | 137 | 0.0249206 | 99.89614 | 0.001320863 | 96.67635 |
| EFC14 | 111 | 0.020191145 | 99.91633 | 0.0010701884 | 96.67742 |
| EFC10 | 111 | 0.020191145 | 99.936516 | 0.0010701884 | 96.67849 |
| EFC11 | 111 | 0.020191145 | 99.9567 | 0.0010701884 | 96.67956 |
| LFC6 | 100 | 0.018190218 | 99.97489 | 9.6413374e-04 | 96.68052 |
| LFC7 | 60 | 0.010914131 | 99.98581 | 5.7848024e-04 | 96.6811 |
| EFC15 | 56 | 0.010186522 | 99.995995 | 5.3991485e-04 | 96.68164 |
| EFC7 | 8 | 0.0014552175 | 99.99745 | 7.713069e-05 | 96.68172 |
| EFC6 | 7 | 0.0012733152 | 99.998726 | 6.748936e-05 | 96.681786 |
| EFC12 | 3 | 5.4570656e-04 | 99.999275 | 2.8924012e-05 | 96.681816 |
| LFC15 | 2 | 3.6380436e-04 | 99.99964 | 1.9282673e-05 | 96.68184 |
| EFC13 | 1 | 1.8190218e-04 | 99.999825 | 9.641336e-06 | 96.68185 |
| EFCB | 1 | 1.8190218e-04 | 100.00001 | 9.641336e-06 | 96.681854 |
| PORTI | 0 | | | | |
| PORTO | 0 | | | | |

In 'MEMORY: LOADS VS STORES', Opcode frequencies for 'ldstOther' (3.318172)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| z377 | 104826 | 30.45842 | 30.45842 | 1.0106628 | 97.69252 |
| LADRB | 78552 | 22.824202 | 53.282623 | 0.75734625 | 98.44987 |
| LINKB | 53643 | 15.586601 | 68.869225 | 0.5171902 | 98.96706 |
| GADRB | 34990 | 10.166753 | 79.03598 | 0.33735037 | 99.304405 |
| MISC | 22733 | 6.605339 | 85.64132 | 0.2191765 | 99.52358 |
| DESCB | 9762 | 2.8364632 | 88.47778 | 0.09411873 | 99.6177 |
| LSTF | 7079 | 2.0568862 | 90.53467 | 0.06825102 | 99.68595 |
| DST | 7070 | 2.0542712 | 92.588936 | 0.06816425 | 99.75411 |
| FREE | 4316 | 1.2540642 | 93.843 | 0.041612005 | 99.79572 |
| ALLOC | 4290 | 1.2465096 | 95.08951 | 0.041361332 | 99.83708 |
| BLT | 3958 | 1.1500431 | 96.23955 | 0.03816041 | 99.875244 |
| CATCH | 2824 | 0.82054625 | 97.0601 | 0.027227135 | 99.90247 |
| MRE | 2454 | 0.71303835 | 97.77313 | 0.02365984 | 99.92613 |
| DWDC | 2370 | 0.68863115 | 98.46176 | 0.022849967 | 99.94898 |
| IWDC | 2370 | 0.68863115 | 99.15039 | 0.022849967 | 99.97183 |
| MXW | 1919 | 0.55758786 | 99.70798 | 0.018501725 | 99.99033 |
| LLKB | 674 | 0.19583858 | 99.90382 | 0.0064982605 | 99.99683 |
| BLTC | 282 | 0.08193839 | 99.985756 | 0.0027188568 | 99.99955 |
| DESCBS | 26 | 0.0075546036 | 99.99331 | 2.5067475e-04 | 99.9998 |
| BLTL | 14 | 0.0040678635 | 99.997375 | 1.3497871e-04 | 99.99994 |
| ME | 4 | 0.0011622467 | 99.998535 | 3.8565345e-05 | 99.99998 |
| MXD | 4 | 0.0011622467 | 99.999695 | 3.8565345e-05 | 100.000015 |
| LST | 1 | 2.9056168e-04 | 99.999985 | 9.641336e-06 | 100.00002 |
| z276 | 0 | | | | |
| z277 | 0 | | | | |
| REQUEUE | 0 | | | | |
| NOOP | 0 | | | | |
| NOTIFY | 0 | | | | |
| 75 | 0 | | | | |
| 76 | 0 | | | | |
| 77 | 0 | | | | |
| BLTCL | 0 | | | | |
| BCAST | 0 | | | | |
| z174 | 0 | | | | |
| z175 | 0 | | | | |
| z176 | 0 | | | | |
| STOP | 0 | | | | |
| z177 | 0 | | | | |
| z271 | 0 | | | | |
| BITBLT | 0 | | | | |
| STARTIO | 0 | | | | |
| JRAM | 0 | | | | |
| z272 | 0 | | | | |
| z273 | 0 | | | | |
| z274 | 0 | | | | |
| z373 | 0 | | | | |
| WR | 0 | | | | |

```
RR              0
BRK             0
z275            0
```

STATISTICS FOR 'ALU INPUTS FOR MEMORY ADDRESS'

Instruction Frequencies by Group: ALU INPUTS FOR MEMORY ADDRESS

| | | | |
|---|---|---|---|
| aiMem2 | 4066623 | 39.207684 | 39.207684 |
| aiAlu | 2169214 | 20.914122 | 60.121803 |
| aiImmed | 1092501 | 10.53317 | 70.654976 |
| aiCmplx | 994129 | 9.584732 | 80.23971 |
| aiAluCbr | 873751 | 8.424128 | 88.66383 |
| aiMem2Plus | 572110 | 5.515905 | 94.17974 |
| aiAluPlus | 240493 | 2.3186738 | 96.49841 |
| aiJump | 179889 | 1.7343703 | 98.23278 |
| aiMem3Plus | 117321 | 1.1311312 | 99.363914 |
| aiMem3 | 65975 | 0.6360872 | 100.0 |

OPCODES WITHIN GROUPS OF ALU INPUTS FOR MEMORY ADDRESS

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiMem2' (39.207684)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| LLDB | 730510 | 17.963554 | 17.963554 | 7.0430927 | 7.0430927 |
| LL0 | 662410 | 16.288944 | 34.2525 | 6.3865175 | 13.42961 |
| SLDB | 533914 | 13.129173 | 47.38167 | 5.1476445 | 18.577255 |
| R0 | 190646 | 4.6880665 | 52.06974 | 1.8380823 | 20.415337 |
| LL2 | 182944 | 4.4986715 | 56.568413 | 1.7638247 | 22.179161 |
| LL1 | 161270 | 3.9656982 | 60.53411 | 1.5548583 | 23.73402 |
| LL3 | 154693 | 3.803967 | 64.33808 | 1.4914472 | 25.225468 |
| RDBL | 152282 | 3.7446797 | 68.08276 | 1.468202 | 26.69367 |
| SL1 | 137125 | 3.3719625 | 71.45473 | 1.3220682 | 28.01574 |
| LL5 | 126408 | 3.1084268 | 74.563156 | 1.218742 | 29.234482 |
| PL0 | 118345 | 2.9101542 | 77.47331 | 1.141004 | 30.375486 |
| SL0 | 117019 | 2.8775473 | 80.35086 | 1.1282195 | 31.503706 |
| SL5 | 114804 | 2.8230796 | 83.17394 | 1.106864 | 32.61057 |
| SLB | 66245 | 1.6289929 | 84.80293 | 0.6386904 | 33.24926 |
| LL4 | 64520 | 1.5865746 | 86.38951 | 0.62205906 | 33.87132 |
| SL4 | 61076 | 1.5018849 | 87.891396 | 0.58885427 | 34.460175 |
| LGDB | 51178 | 1.2584889 | 89.14989 | 0.49342432 | 34.953598 |
| LLB | 47482 | 1.1676028 | 90.31749 | 0.45778995 | 35.41139 |
| PL2 | 45334 | 1.1147825 | 91.432274 | 0.43708034 | 35.84847 |
| SL2 | 43768 | 1.0762738 | 92.508545 | 0.421982 | 36.27045 |
| LGB | 40880 | 1.0052568 | 93.5138 | 0.39413786 | 36.66459 |
| SL3 | 33532 | 0.8245662 | 94.33837 | 0.3232933 | 36.98788 |
| WDBL | 32349 | 0.79547577 | 95.13385 | 0.3118876 | 37.299767 |
| RD0 | 22434 | 0.5516617 | 95.68551 | 0.21629376 | 37.51606 |
| LL6 | 22048 | 0.54216976 | 96.22768 | 0.2125722 | 37.728634 |
| SL6 | 21704 | 0.5337107 | 96.76139 | 0.20925555 | 37.93789 |
| PL3 | 18356 | 0.45138187 | 97.212776 | 0.17697639 | 38.114864 |
| LG1 | 15664 | 0.38518448 | 97.59796 | 0.1510219 | 38.265884 |
| LG2 | 13340 | 0.3280363 | 97.925995 | 0.12861543 | 38.3945 |
| LG4 | 12694 | 0.3121509 | 98.238144 | 0.12238712 | 38.516888 |
| WD0 | 12191 | 0.2997819 | 98.537926 | 0.11753752 | 38.634426 |
| SGB | 10182 | 0.25037975 | 98.78831 | 0.09816809 | 38.732594 |
| PL1 | 9600 | 0.2360681 | 99.024376 | 0.09255683 | 38.82515 |
| LG0 | 7286 | 0.17916585 | 99.203545 | 0.07024678 | 38.895397 |
| SGDB | 7082 | 0.17414941 | 99.37769 | 0.06827994 | 38.963676 |
| RBL | 4158 | 0.10224699 | 99.47994 | 0.040088682 | 39.003765 |
| LG3 | 4150 | 0.10205028 | 99.58199 | 0.04001155 | 39.043777 |
| W0 | 3920 | 0.09639448 | 99.67839 | 0.03779404 | 39.08157 |
| LG5 | 3874 | 0.09526331 | 99.77365 | 0.037350538 | 39.11892 |
| WBL | 3095 | 0.07610738 | 99.84976 | 0.029839935 | 39.148758 |
| LL7 | 2991 | 0.07354998 | 99.92331 | 0.028837237 | 39.177597 |
| SL7 | 1474 | 0.036246295 | 99.95956 | 0.01421133 | 39.191807 |
| LG6 | 906 | 0.022278929 | 99.981834 | 0.00873505 | 39.200542 |
| WS0 | 302 | 0.0074263096 | 99.98926 | 0.0029116836 | 39.203453 |
| SG3 | 224 | 0.0055082555 | 99.99477 | 0.0021596594 | 39.205612 |
| LG7 | 148 | 0.0036393836 | 99.998405 | 0.0014269176 | 39.20704 |
| SG0 | 48 | 0.0011803405 | 99.99959 | 4.627842e-04 | 39.2075 |
| SG1 | 10 | 2.459043e-04 | 99.99983 | 9.6413364e-05 | 39.207596 |
| SG2 | 8 | 1.9672344e-04 | 100.00003 | 7.713069e-05 | 39.207672 |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiAlu' (20.914122)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| PUSH | 511092 | 23.561161 | 23.561161 | 4.92761 | 44.13528 |
| NILCKL | 276181 | 12.731847 | 36.293007 | 2.6627538 | 46.798035 |
| ADD | 241286 | 11.123199 | 47.416206 | 2.3263195 | 49.124355 |
| SUB | 144918 | 6.680669 | 54.096874 | 1.3972032 | 50.521557 |
| BNDCK | 137810 | 6.3529925 | 60.449867 | 1.3286725 | 51.85023 |
| INC | 126437 | 5.828701 | 66.278564 | 1.2190217 | 53.069252 |
| NILCK | 119508 | 5.509277 | 71.78784 | 1.1522168 | 54.22147 |
| DADD | 93228 | 4.297778 | 76.08562 | 0.8988425 | 55.12031 |
| EXCH | 90807 | 4.1861706 | 80.27179 | 0.87550087 | 55.99581 |
| OR | 84359 | 3.8889198 | 84.160706 | 0.8133335 | 56.809143 |
| DUCOMP | 79424 | 3.6614184 | 87.82212 | 0.7657535 | 57.574898 |

| | | | | | |
|---|---|---|---|---|---|
| LADRB | 78552 | 3.6212194 | 91.44334 | 0.75734625 | 58.332245 |
| DUP | 61055 | 2.814614 | 94.25795 | 0.58865175 | 58.9209 |
| GADRB | 34990 | 1.6130266 | 95.87098 | 0.33735037 | 59.258247 |
| DBL | 22499 | 1.0371959 | 96.90817 | 0.21692042 | 59.475166 |
| AND | 18124 | 0.83550997 | 97.74368 | 0.17473959 | 59.649906 |
| POP | 18115 | 0.835095 | 98.57878 | 0.17465281 | 59.82456 |
| XOR | 16415 | 0.75672574 | 99.33551 | 0.15826255 | 59.982822 |
| SHIFT | 3572 | 0.16466794 | 99.500175 | 0.03443885 | 60.01726 |
| CATCH | 2824 | 0.13018541 | 99.63036 | 0.027227135 | 60.044487 |
| DWDC | 2370 | 0.10925616 | 99.73962 | 0.022849967 | 60.067337 |
| IWDC | 2370 | 0.10925616 | 99.84887 | 0.022849967 | 60.090187 |
| DSUB | 2328 | 0.107319975 | 99.95619 | 0.02244503 | 60.112633 |
| LP | 562 | 0.025908003 | 99.9821 | 0.0054184313 | 60.11805 |
| DCOMP | 286 | 0.0131845 | 99.995285 | 0.0027574224 | 60.120808 |
| NEG | 102 | 0.0047021637 | 99.999985 | 9.834164e-04 | 60.12179 |
| ADD01 | 0 | | | | |
| NOOP | 0 | | | | |
| WR | 0 | | | | |
| RR | 0 | | | | |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiImmed' (10.53317)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| LIB | 476775 | 43.64069 | 43.64069 | 4.5967484 | 64.71854 |
| LI0 | 406245 | 37.184864 | 80.825554 | 3.916745 | 68.635284 |
| LIW | 129069 | 11.814085 | 92.63964 | 1.2443976 | 69.879684 |
| LI1 | 50230 | 4.5977073 | 97.23735 | 0.48428435 | 70.36397 |
| LI2 | 10177 | 0.9315323 | 98.168884 | 0.09811989 | 70.46209 |
| LI4 | 9734 | 0.8909832 | 99.05987 | 0.09384877 | 70.55594 |
| LI5 | 3760 | 0.34416442 | 99.40403 | 0.036251426 | 70.59219 |
| LIN1 | 3455 | 0.31624687 | 99.720276 | 0.03331082 | 70.6255 |
| LI3 | 2454 | 0.22462223 | 99.9449 | 0.02365984 | 70.64916 |
| LI6 | 602 | 0.05510292 | 100.0 | 0.005804085 | 70.65497 |
| LINI | 0 | | | | |
| LINB | 0 | | | | |
| LCO | 0 | | | | |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiCmplx' (9.584732)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| MUL | 269746 | 27.133904 | 27.133904 | 2.600712 | 73.255684 |
| RET | 252951 | 25.444485 | 52.57839 | 2.4387858 | 75.69447 |
| z377 | 104826 | 10.544506 | 63.122894 | 1.0106628 | 76.70514 |
| KFCB | 86379 | 8.688912 | 71.811806 | 0.83280907 | 77.53795 |
| SFC | 73761 | 7.4196606 | 79.23147 | 0.71115465 | 78.2491 |
| LFC4 | 25896 | 2.6048934 | 81.836365 | 0.24967206 | 78.49877 |
| MISC | 22733 | 2.2867253 | 84.12309 | 0.2191765 | 78.71795 |
| LFC11 | 18720 | 1.8830555 | 86.00615 | 0.18048582 | 78.89844 |
| EFC5 | 15544 | 1.5635798 | 87.56973 | 0.14986494 | 79.0483 |
| LFCB | 15175 | 1.5264618 | 89.09619 | 0.14630729 | 79.19461 |
| LFC1 | 14563 | 1.4649005 | 90.56109 | 0.14040679 | 79.335014 |
| EFC1 | 8686 | 0.8737297 | 91.434814 | 0.08374464 | 79.41876 |
| LFC2 | 8195 | 0.8243397 | 92.259155 | 0.07901075 | 79.49777 |
| DIV | 8134 | 0.81820374 | 93.07736 | 0.07842263 | 79.576195 |
| LFC8 | 7332 | 0.73753004 | 93.814896 | 0.070690274 | 79.64689 |
| LSTF | 7079 | 0.7120806 | 94.52698 | 0.06825102 | 79.71514 |
| DST | 7070 | 0.71117525 | 95.23815 | 0.06816425 | 79.7833 |
| LFC3 | 6777 | 0.68170223 | 95.91985 | 0.06533934 | 79.84864 |
| LDIV | 5428 | 0.54600563 | 96.46586 | 0.052333174 | 79.90097 |
| FREE | 4316 | 0.43414888 | 96.90001 | 0.041612005 | 79.94258 |
| ALLOC | 4290 | 0.43153353 | 97.33154 | 0.041361332 | 79.98394 |
| BLT | 3958 | 0.39813747 | 97.72968 | 0.03816041 | 80.0221 |
| LFC9 | 3046 | 0.30639887 | 98.03608 | 0.029367509 | 80.05147 |
| LFC14 | 2986 | 0.30036342 | 98.33644 | 0.028789032 | 80.08025 |
| EFC0 | 2964 | 0.29815044 | 98.63459 | 0.02857692 | 80.10883 |
| LFC5 | 2882 | 0.28990202 | 98.92449 | 0.027786331 | 80.13662 |
| MRE | 2454 | 0.24684925 | 99.17134 | 0.02365984 | 80.16028 |
| JIW | 2125 | 0.21375494 | 99.38509 | 0.020487838 | 80.18076 |
| MXW | 1919 | 0.1930333 | 99.578125 | 0.018501725 | 80.199265 |
| LFC16 | 876 | 0.08811733 | 99.666245 | 0.00844581 | 80.20771 |

| | | | | | |
|---|---|---|---|---|---|
| LFC10 | 606 | 0.060957885 | 99.7272 | 0.00584265 | 80.213554 |
| LFC13 | 511 | 0.051401782 | 99.7786 | 0.004926723 | 80.21848 |
| LFC12 | 457 | 0.045969887 | 99.82457 | 0.0044060907 | 80.22289 |
| BLTC | 282 | 0.028366539 | 99.852936 | 0.0027188568 | 80.22561 |
| EFC9 | 206 | 0.020721657 | 99.87366 | 0.0019861153 | 80.22759 |
| EFC8 | 202 | 0.020319295 | 99.893974 | 0.0019475498 | 80.22954 |
| EFC2 | 186 | 0.018709846 | 99.91268 | 0.0017932885 | 80.23133 |
| EFC3 | 137 | 0.013780909 | 99.92646 | 0.001320863 | 80.23265 |
| EFC4 | 137 | 0.013780909 | 99.94024 | 0.001320863 | 80.23397 |
| EFC11 | 111 | 0.011165552 | 99.9514 | 0.0010701884 | 80.23504 |
| EFC14 | 111 | 0.011165552 | 99.96256 | 0.0010701884 | 80.23611 |
| EFC10 | 111 | 0.011165552 | 99.973724 | 0.0010701884 | 80.237175 |
| LFC6 | 100 | 0.0100590575 | 99.98378 | 9.6413374e-04 | 80.23814 |
| LFC7 | 60 | 0.006035434 | 99.989815 | 5.7848024e-04 | 80.238716 |
| EFC15 | 56 | 0.005633072 | 99.995445 | 5.3991485e-04 | 80.23926 |
| BLTL | 14 | 0.001408268 | 99.99686 | 1.3497871e-04 | 80.239395 |
| EFC7 | 8 | 8.047246e-04 | 99.99766 | 7.713069e-05 | 80.23947 |
| EFC6 | 7 | 7.04134e-04 | 99.99836 | 6.748936e-05 | 80.23954 |
| ME | 4 | 4.023623e-04 | 99.998764 | 3.8565345e-05 | 80.23958 |
| MXD | 4 | 4.023623e-04 | 99.99917 | 3.8565345e-05 | 80.23962 |
| EFC12 | 3 | 3.017717e-04 | 99.99947 | 2.8924012e-05 | 80.23965 |
| LFC15 | 2 | 2.0118115e-04 | 99.99967 | 1.9282673e-05 | 80.23967 |
| LST | 1 | 1.0059057e-04 | 99.99977 | 9.641336e-06 | 80.23968 |
| EFCB | 1 | 1.0059057e-04 | 99.99987 | 9.641336e-06 | 80.239685 |
| EFC13 | 1 | 1.0059057e-04 | 99.99997 | 9.641336e-06 | 80.23969 |
| z271 | 0 | | | | |
| z272 | 0 | | | | |
| z273 | 0 | | | | |
| z274 | 0 | | | | |
| z275 | 0 | | | | |
| z276 | 0 | | | | |
| z277 | 0 | | | | |
| PORTO | 0 | | | | |
| PORTI | 0 | | | | |
| 76 | 0 | | | | |
| 77 | 0 | | | | |
| z174 | 0 | | | | |
| z175 | 0 | | | | |
| BLTCL | 0 | | | | |
| z176 | 0 | | | | |
| z177 | 0 | | | | |
| STOP | 0 | | | | |
| JIB | 0 | | | | |
| BITBLT | 0 | | | | |
| STARTIO | 0 | | | | |
| JRAM | 0 | | | | |
| NOTIFY | 0 | | | | |
| BCAST | 0 | | | | |
| REQUEUE | 0 | | | | |
| z373 | 0 | | | | |
| BRK | 0 | | | | |
| 75 | 0 | | | | |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiAluCbr' (8.424128)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| JZNEB | 314475 | 35.991375 | 35.991375 | 3.0319593 | 83.27165 |
| JZEQB | 197166 | 22.565468 | 58.556843 | 1.9009438 | 85.17259 |
| JLB | 105863 | 12.115923 | 70.67277 | 1.0206608 | 86.19325 |
| JGB | 59107 | 6.764742 | 77.43751 | 0.5698705 | 86.76312 |
| JULEB | 56203 | 6.432382 | 83.86989 | 0.541872 | 87.30499 |
| JULB | 41564 | 4.756962 | 88.62685 | 0.40073252 | 87.70573 |
| JEQB | 30005 | 3.4340448 | 92.06089 | 0.2892883 | 87.99502 |
| JGEB | 20465 | 2.3422005 | 94.40309 | 0.19730996 | 88.19233 |
| JNEB | 13564 | 1.5523873 | 95.95548 | 0.1307751 | 88.323105 |
| JNE7 | 11798 | 1.3502703 | 97.305756 | 0.11374849 | 88.43685 |
| JNE4 | 9684 | 1.1083249 | 98.41408 | 0.0933667 | 88.53022 |
| JUGEB | 2864 | 0.32778218 | 98.74186 | 0.027612786 | 88.55783 |
| JUGB | 2628 | 0.3007722 | 99.04263 | 0.025337431 | 88.58317 |
| JEQ5 | 1959 | 0.22420576 | 99.26684 | 0.018887378 | 88.60206 |
| JEQ4 | 1512 | 0.17304701 | 99.43989 | 0.014577701 | 88.61664 |
| JNE3 | 868 | 0.0993418 | 99.53923 | 0.00836868 | 88.62501 |
| JNE9 | 785 | 0.08984253 | 99.629074 | 0.007568449 | 88.632576 |

| | | | | | |
|---|---|---|---|---|---|
| JNE5 | 702 | 0.080343256 | 99.70942 | 0.006768218 | 88.63934 |
| JEQ7 | 697 | 0.07977101 | 99.78919 | 0.0067200127 | 88.646065 |
| JLEB | 609 | 0.06969949 | 99.858894 | 0.0058715734 | 88.65194 |
| JLQ3 | 428 | 0.048984203 | 99.907875 | 0.004126492 | 88.65607 |
| JNE6 | 405 | 0.04635188 | 99.95422 | 0.0039047413 | 88.65997 |
| JLQ8 | 284 | 0.032503538 | 99.986725 | 0.0027381396 | 88.66271 |
| JEQ9 | 96 | 0.0109871125 | 99.99771 | 9.255684e-04 | 88.663635 |
| JNE8 | 12 | 0.001373389 | 99.999084 | 1.1569605e-04 | 88.66375 |
| JEQ6 | 8 | 9.155926e-04 | 100.0 | 7.713069e-05 | 88.663826 |
| JEQ2 | 0 | | | | |
| JNE2 | 0 | | | | |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiMem2Plus' (5.515905)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RILP | 322109 | 56.301933 | 56.301933 | 3.1055613 | 91.76939 |
| WILP | 119595 | 20.904198 | 77.20613 | 1.1530557 | 92.92244 |
| RFL | 29440 | 5.1458635 | 82.352 | 0.28384094 | 93.20628 |
| WFL | 25939 | 4.5339184 | 86.88592 | 0.25008664 | 93.45637 |
| RILO | 25060 | 4.380276 | 91.2662 | 0.24161191 | 93.69798 |
| RXLP | 21395 | 3.7396655 | 95.00586 | 0.2062764 | 93.90426 |
| RIGP | 17154 | 2.9983745 | 98.004234 | 0.16538749 | 94.06965 |
| DESCB | 9762 | 1.7063151 | 99.71055 | 0.09411873 | 94.163765 |
| LLKB | 674 | 0.11780951 | 99.82836 | 0.0064982605 | 94.170265 |
| WXLP | 662 | 0.11571201 | 99.94408 | 0.0063825645 | 94.17665 |
| RILPL | 294 | 0.05138872 | 99.99547 | 0.0028345528 | 94.17949 |
| DESCBS | 26 | 0.0045445805 | 100.000015 | 2.5067475e-04 | 94.17974 |
| RIGPL | 0 | | | | |
| WIGPL | 0 | | | | |
| WXLPL | 0 | | | | |
| RXGPL | 0 | | | | |
| RFSL | 0 | | | | |
| WFSL | 0 | | | | |
| WXGPL | 0 | | | | |
| RXLPL | 0 | | | | |
| WILPL | 0 | | | | |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiAluPlus' (2.3186738)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RSTR | 141716 | 58.927284 | 58.927284 | 1.3663316 | 95.546074 |
| LINKB | 53643 | 22.305431 | 81.23271 | 0.5171902 | 96.06326 |
| RSTRL | 26954 | 11.20781 | 92.44052 | 0.25987258 | 96.323135 |
| WSTR | 12322 | 5.1236415 | 97.56416 | 0.118800545 | 96.44193 |
| WSTRL | 5858 | 2.4358296 | 99.99999 | 0.056478953 | 96.49841 |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiJump' (1.7343703)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| JB | 109355 | 60.790264 | 60.790264 | 1.0543283 | 97.55274 |
| JW | 37262 | 20.713884 | 81.50415 | 0.35925546 | 97.911995 |
| J2 | 21769 | 12.101352 | 93.6055 | 0.20988224 | 98.12188 |
| J3 | 7537 | 4.189806 | 97.7953 | 0.07266675 | 98.19455 |
| J9 | 1748 | 0.9717103 | 98.76701 | 0.016853057 | 98.2114 |
| J4 | 1152 | 0.6403949 | 99.40741 | 0.01110682 | 98.22251 |
| J7 | 890 | 0.4947495 | 99.90216 | 0.008580789 | 98.231094 |
| J5 | 158 | 0.087831945 | 99.98999 | 0.0015233312 | 98.23262 |
| J6 | 18 | 0.01000617 | 100.0 | 1.7354406e-04 | 98.232796 |
| J8 | 0 | | | | |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiMem3Plus' (1.1311312)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| RF | 114133 | 97.28267 | 97.28267 | 1.1003947 | 99.33319 |

| | | | | | |
|---|---|---|---|---|---|
| WSF | 2396 | 2.0422602 | 99.32493 | 0.02310064 | 99.35629 |
| WF | 642 | 0.5472166 | 99.87215 | 0.006189738 | 99.36248 |
| RFC | 150 | 0.12785435 | 100.0 | 0.0014462005 | 99.36393 |
| RFS | 0 | | | | |
| WFS | 0 | | | | |

In 'ALU INPUTS FOR MEMORY ADDRESS', Opcode frequencies for 'aiMem3' (0.6360872)

| OPCODE | COUNT | PERCENT | CUM PERCENT | SYS PERCENT | SYS CUM |
|---|---|---|---|---|---|
| WSDB | 32621 | 49.44449 | 49.44449 | 0.31451 | 99.67844 |
| RDB | 18369 | 27.842363 | 77.28685 | 0.17710172 | 99.85554 |
| W1 | 3744 | 5.674877 | 82.96173 | 0.036097167 | 99.89163 |
| R1 | 2742 | 4.15612 | 87.11785 | 0.026436543 | 99.91807 |
| R4 | 2704 | 4.098522 | 91.21637 | 0.026070175 | 99.94414 |
| R3 | 2368 | 3.5892382 | 94.80561 | 0.022830682 | 99.966965 |
| RB | 1212 | 1.8370595 | 96.64267 | 0.0116853 | 99.97865 |
| WB | 889 | 1.34748 | 97.99015 | 0.008571148 | 99.98722 |
| WSB | 714 | 1.0822282 | 99.07238 | 0.0068839145 | 99.9941 |
| R2 | 362 | 0.5486927 | 99.62107 | 0.0034901638 | 99.99759 |
| W2 | 142 | 0.21523304 | 99.8363 | 0.0013690698 | 99.998955 |
| WDB | 108 | 0.16369838 | 100.0 | 0.0010412644 | 99.99999 |

PAIR STATISTICS BY GROUP: PRINC OPS
5186003 total pairs

| | | | |
|---|---|---|---|
| <Ld/Store, | Ld/Store> | 599195, 11.554081 | 11.554081 |
| <Ld/Store, | Stack Ops> | 298961, 5.764767 | 17.318848 |
| <Ld/Store, | ALU Ops> | 253507, 4.8882923 | 22.20714 |
| <ALU Ops, | Ld/Store> | 245417, 4.732296 | 26.939436 |
| <Stack Ops, | R/W> | 242480, 4.6756625 | 31.615099 |
| <Ld/Store, | Ld Immed> | 234978, 4.531004 | 36.146103 |
| <CondJumps, | Ld/Store> | 223527, 4.3101983 | 40.456303 |
| <Stack Ops, | Ld/Store> | 212972, 4.1066694 | 44.562973 |
| <Xfers, | Ld/Store> | 205802, 3.9684129 | 48.531387 |
| <Ld/Store, | R/W> | 177149, 3.415906 | 51.947292 |
| <R/W, | CondJumps> | 151589, 2.9230412 | 54.870335 |
| <R/W, | R/W> | 148338, 2.8603533 | 57.730686 |
| <Ld Immed, | ALU Ops> | 134791, 2.5991309 | 60.32982 |
| <R/W, | Ld/Store> | 134466, 2.5928638 | 62.922684 |
| <Ld/Store, | Xfers> | 115847, 2.2338398 | 65.156525 |
| <Ld Immed, | CondJumps> | 114036, 2.1989188 | 67.355446 |
| <R/W, | Stack Ops> | 97712, 1.8841485 | 69.23959 |
| <Ld/Store, | CondJumps> | 92379, 1.781314 | 71.020905 |
| <ALU Ops, | CondJumps> | 90521, 1.7454868 | 72.76639 |
| <Misc, | Ld/Store> | 89857, 1.7326832 | 74.49907 |
| <CondJumps, | Ld Immed> | 87251, 1.6824326 | 76.1815 |
| <R/W, | ALU Ops> | 85892, 1.6562274 | 77.83773 |
| <ALU Ops, | Ld Immed> | 75626, 1.4582714 | 79.296005 |
| <Ld Immed, | R/W> | 69468, 1.3395287 | 80.63554 |
| <Ld Immed, | Xfers> | 60205, 1.1609133 | 81.79645 |
| <Stack Ops, | Stack Ops> | 60058, 1.1580788 | 82.95453 |
| <Jumps, | Ld/Store> | 59114, 1.139876 | 84.094406 |
| <ALU Ops, | R/W> | 55573, 1.0715959 | 85.166 |
| <Ld Immed, | Ld/Store> | 52772, 1.0175852 | 86.183586 |
| <Ld Immed, | Ld Immed> | 50304, 0.9699956 | 87.15358 |
| <ALU Ops, | Stack Ops> | 47610, 0.9180481 | 88.071625 |
| <R/W, | Xfers> | 47147, 0.9091202 | 88.98074 |
| <Ld Immed, | Stack Ops> | 45871, 0.8845156 | 89.86526 |
| <CondJumps, | Stack Ops> | 43530, 0.83937473 | 90.704636 |
| <Stack Ops, | ALU Ops> | 42351, 0.8166405 | 91.52128 |
| <R/W, | Ld Immed> | 41659, 0.80329695 | 92.32458 |
| <ALU Ops, | ALU Ops> | 40991, 0.79041605 | 93.11499 |
| <Stack Ops, | Ld Immed> | 38278, 0.73810215 | 93.853096 |
| <Xfers, | Stack Ops> | 28690, 0.5532199 | 94.40632 |
| <Ld/Store, | Jumps> | 28504, 0.54963326 | 94.955956 |
| <CondJumps, | Jumps> | 24483, 0.47209768 | 95.428055 |
| <Stack Ops, | Xfers> | 24120, 0.4650981 | 95.89315 |
| <Misc, | R/W> | 23175, 0.44687595 | 96.34003 |
| <CondJumps, | Xfers> | 22227, 0.42859597 | 96.76862 |
| <Ld/Store, | Misc> | 21375, 0.41216712 | 97.18079 |
| <R/W, | Jumps> | 20342, 0.39224815 | 97.573044 |
| <Ld Immed, | Jumps> | 15835, 0.30534112 | 97.87839 |
| <Stack Ops, | Jumps> | 12693, 0.24475498 | 98.123146 |
| <CondJumps, | R/W> | 11575, 0.22319696 | 98.346344 |
| <Xfers, | Ld Immed> | 9472, 0.18264546 | 98.52899 |
| <Misc, | Stack Ops> | 6466, 0.12468176 | 98.65367 |
| <Xfers, | Xfers> | 6045, 0.11656376 | 98.77023 |
| <Misc, | Ld Immed> | 5781, 0.11147313 | 98.88171 |
| <Jumps, | Stack Ops> | 5232, 0.10088695 | 98.98259 |
| <Misc, | Xfers> | 5180, 0.09988424 | 99.08247 |
| <Xfers, | CondJumps> | 5020, 0.09679902 | 99.179276 |
| <Jumps, | Xfers> | 4977, 0.09596986 | 99.275246 |
| <CondJumps, | Misc> | 4301, 0.08293477 | 99.35818 |
| <Xfers, | R/W> | 3885, 0.07491318 | 99.43309 |
| <Xfers, | Misc> | 3850, 0.074238296 | 99.50733 |
| <R/W, | Misc> | 3657, 0.070516734 | 99.57785 |
| <Jumps, | Ld Immed> | 2918, 0.056266837 | 99.63412 |
| <Ld Immed, | Misc> | 2876, 0.055456967 | 99.689575 |
| <R/W, | Processes> | 2454, 0.04731968 | 99.73689 |
| <Misc, | Jumps> | 2362, 0.04554567 | 99.78244 |
| <Jumps, | R/W> | 1742, 0.033590417 | 99.81603 |
| <ALU Ops, | Jumps> | 1426, 0.027497091 | 99.84353 |
| <Processes, | Misc> | 1235, 0.023814101 | 99.86734 |
| <Jumps, | CondJumps> | 1230, 0.023717687 | 99.89106 |
| <Stack Ops, | CondJumps> | 1043, 0.020111828 | 99.91117 |
| <Misc, | CondJumps> | 993, 0.019147694 | 99.93032 |
| <Xfers, | Jumps> | 949, 0.018299255 | 99.94862 |

```
<ALU Ops,  Xfers>          842, 0.01623601    99.96486
<Misc,     ALU Ops>        575, 0.011087537   99.975945
<Misc,     Misc>           284, 0.0054762793  99.98142
<Processes,Ld/Store>       229, 0.004415732   99.98584
<Jumps,    Misc>           119, 0.002294638   99.98814
<Processes,Xfers>          113, 0.002178942   99.99032
<ALU Ops,  Misc>           101, 0.0019475498  99.99226
<Processes,Ld Immed>        76, 0.0014654832  99.99373
<Processes,Stack Ops>       74, 0.0014269176  99.995155
<Processes,R/W>             72, 0.0013883525  99.996544
<Processes,ALU Ops>         62, 0.0011955258  99.99774
<Processes,CondJumps>       46, 8.8700294e-04 99.99863
<Jumps,    Jumps>           35, 6.7489357e-04 99.9993
<Processes,Jumps>           16, 3.0852275e-04 99.9996
<Stack Ops,Misc>            12, 2.313921e-04  99.99983
<ALU Ops,  Processes>        4, 7.713069e-05  99.99991
<Xfers,    ALU Ops>          4, 7.713069e-05  99.999985
<Jumps,    ALU Ops>          2, 3.8565345e-05 100.00002
```

PAIR STATISTICS BY GROUP: LOCALS VS GLOBALS GROUP
5186003 total pairs

| | | | |
|---|---|---|---|
| <locals, | locals> | 564101, 10.877376 | 10.877376 |
| <locals, | other> | 314962, 6.073309 | 16.950684 |
| <other, | locals> | 308845, 5.955357 | 22.90604 |
| <AluInLG, | locals> | 245296, 4.729963 | 27.636003 |
| <locals, | LdImmedInLG> | 238092, 4.59105 | 32.227055 |
| <locals, | AluInLG> | 236293, 4.5563602 | 36.783417 |
| <CondJumpsInLG, | locals> | 219149, 4.2257786 | 41.009193 |
| <xfersInLG, | locals> | 207182, 3.995023 | 45.004215 |
| <other, | addresses> | 189421, 3.6525433 | 48.656757 |
| <addresses, | CondJumpsInLG> | 145231, 2.800442 | 51.4572 |
| <locals, | xfersInLG> | 138572, 2.6720386 | 54.12924 |
| <LdImmedInLG, | AluInLG> | 134791, 2.5991309 | 56.72837 |
| <LdImmedInLG, | CondJumpsInLG> | 114036, 2.1989188 | 58.927288 |
| <addresses, | locals> | 113474, 2.188082 | 61.11537 |
| <locals, | addresses> | 95014, 1.8321239 | 62.947495 |
| <AluInLG, | CondJumpsInLG> | 90521, 1.7454868 | 64.69298 |
| <CondJumpsInLG, | LdImmedInLG> | 87251, 1.6824326 | 66.37541 |
| <locals, | CondJumpsInLG> | 79859, 1.539895 | 67.915306 |
| <AluInLG, | LdImmedInLG> | 75626, 1.4582714 | 69.37358 |
| <other, | other> | 68129, 1.3137091 | 70.68729 |
| <localsIndir, | other> | 66061, 1.2738327 | 71.96112 |
| <LdImmedInLG, | addresses> | 61813, 1.1919198 | 73.15304 |
| <LdImmedInLG, | xfersInLG> | 60200, 1.1608169 | 74.31386 |
| <localsIndir, | localsIndir> | 59859, 1.1542416 | 75.4681 |
| <JumpsInLG, | locals> | 59547, 1.1482253 | 76.616325 |
| <localsIndir, | addresses> | 55358, 1.0674502 | 77.68378 |
| <other, | localsIndir> | 53046, 1.0228688 | 78.70664 |
| <LdImmedInLG, | LdImmedInLG> | 50304, 0.9699956 | 79.676636 |
| <LdImmedInLG, | other> | 48747, 0.9399724 | 80.61661 |
| <LdImmedInLG, | locals> | 48373, 0.9327607 | 81.54937 |
| <CondJumpsInLG, | other> | 47831, 0.9223095 | 82.47168 |
| <AluInLG, | other> | 47715, 0.92007275 | 83.391754 |
| <locals, | localsIndir> | 47013, 0.9065363 | 84.298294 |
| <other, | LdImmedInLG> | 44135, 0.85104074 | 85.14934 |
| <other, | AluInLG> | 42988, 0.8289236 | 85.978264 |
| <AluInLG, | AluInLG> | 40991, 0.79041605 | 86.76868 |
| <localsIndir, | AluInLG> | 36423, 0.7023328 | 87.47101 |
| <addresses, | other> | 35025, 0.67537565 | 88.146385 |
| <locals, | globals> | 34870, 0.67238684 | 88.81877 |
| <addresses, | AluInLG> | 34685, 0.6688195 | 89.487595 |
| <xfersInLG, | other> | 32530, 0.62726536 | 90.11486 |
| <globals, | AluInLG> | 32000, 0.6170455 | 90.7319 |
| <other, | xfersInLG> | 29411, 0.5671227 | 91.29903 |
| <addresses, | localsIndir> | 28955, 0.5583298 | 91.85735 |
| <locals, | JumpsInLG> | 28510, 0.549749 | 92.407104 |
| <AluInLG, | localsIndir> | 28314, 0.5459696 | 92.95307 |
| <CondJumpsInLG, | JumpsInLG> | 24483, 0.47209768 | 93.42517 |
| <addresses, | LdImmedInLG> | 24426, 0.47099857 | 93.89617 |
| <CondJumpsInLG, | xfersInLG> | 22227, 0.42859597 | 94.32477 |
| <addresses, | JumpsInLG> | 20046, 0.38654043 | 94.71131 |
| <other, | globals> | 17454, 0.33655977 | 95.047874 |
| <LdImmedInLG, | JumpsInLG> | 15835, 0.30534112 | 95.35322 |
| <other, | JumpsInLG> | 15071, 0.29060917 | 95.64383 |
| <AluInLG, | globals> | 14989, 0.28902798 | 95.93285 |
| <addresses, | globals> | 13739, 0.26492465 | 96.19778 |
| <globals, | CondJumpsInLG> | 12705, 0.24498634 | 96.442764 |
| <AluInLG, | addresses> | 12391, 0.23893161 | 96.681694 |
| <CondJumpsInLG, | localsIndir> | 11144, 0.2148861 | 96.89658 |
| <globals, | localsIndir> | 10473, 0.20194743 | 97.09853 |
| <globals, | locals> | 10279, 0.1982066 | 97.29674 |
| <xfersInLG, | LdImmedInLG> | 9472, 0.18264546 | 97.479385 |
| <globals, | addresses> | 8617, 0.1661588 | 97.645546 |
| <globals, | other> | 8121, 0.15659459 | 97.80214 |
| <localsIndir, | LdImmedInLG> | 7916, 0.15264164 | 97.95478 |
| <localsIndir, | xfersInLG> | 7106, 0.13702267 | 98.091805 |
| <addresses, | xfersInLG> | 6958, 0.13416884 | 98.225975 |
| <globalsIndir, | xfersInLG> | 6653, 0.12828763 | 98.35426 |
| <globals, | globalsIndir> | 6633, 0.12790197 | 98.48216 |
| <globals, | LdImmedInLG> | 6203, 0.11961042 | 98.601776 |
| <xfersInLG, | xfersInLG> | 6045, 0.11656376 | 98.71834 |
| <LdImmedInLG, | localsIndir> | 5625, 0.10846504 | 98.826805 |
| <JumpsInLG, | other> | 5351, 0.10318159 | 98.929985 |

| | | | | |
|---|---|---|---|---|
| <xfersInLG, | CondJumpsInLG> | 5020, | 0.09679902 | 99.02679 |
| <JumpsInLG, | xfersInLG> | 4977, | 0.09596986 | 99.12276 |
| <CondJumpsInLG, | globals> | 4809, | 0.09273037 | 99.215485 |
| <localsIndir, | globals> | 4700, | 0.09062857 | 99.306114 |
| <LdImmedInLG, | globals> | 4564, | 0.088006115 | 99.39412 |
| <localsIndir, | CondJumpsInLG> | 4249, | 0.08193208 | 99.47605 |
| <globals, | xfersInLG> | 3375, | 0.065079026 | 99.54113 |
| <globals, | globals> | 2918, | 0.056266837 | 99.5974 |
| <JumpsInLG, | LdImmedInLG> | 2918, | 0.056266837 | 99.65366 |
| <localsIndir, | locals> | 2539, | 0.048958707 | 99.70262 |
| <xfersInLG, | globals> | 2140, | 0.04126492 | 99.74389 |
| <other, | CondJumpsInLG> | 2082, | 0.040146527 | 99.784035 |
| <globalsIndir, | CondJumpsInLG> | 1924, | 0.037099864 | 99.82114 |
| <LdImmedInLG, | globalsIndir> | 1870, | 0.036058598 | 99.85719 |
| <AluInLG, | JumpsInLG> | 1426, | 0.027497091 | 99.88469 |
| <JumpsInLG, | CondJumpsInLG> | 1230, | 0.023717687 | 99.90841 |
| <addresses, | addresses> | 1208, | 0.023293469 | 99.9317 |
| <JumpsInLG, | globals> | 1155, | 0.022271488 | 99.95397 |
| <xfersInLG, | JumpsInLG> | 949, | 0.018299255 | 99.972275 |
| <AluInLG, | xfersInLG> | 842, | 0.01623601 | 99.98851 |
| <localsIndir, | JumpsInLG> | 288, | 0.00555341 | 99.994064 |
| <JumpsInLG, | localsIndir> | 147, | 0.0028345528 | 99.9969 |
| <locals, | globalsIndir> | 53, | 0.0010219816 | 99.997925 |
| <xfersInLG, | localsIndir> | 40, | 7.713069e-04 | 99.998695 |
| <JumpsInLG, | JumpsInLG> | 35, | 6.7489357e-04 | 99.99937 |
| <other, | globalsIndir> | 21, | 4.0493612e-04 | 99.99977 |
| <JumpsInLG, | addresses> | 7, | 1.3497871e-04 | 99.99991 |
| <JumpsInLG, | AluInLG> | 2, | 3.8565345e-05 | 99.99995 |
| <xfersInLG, | AluInLG> | 2, | 3.8565345e-05 | 99.999985 |
| <globals, | JumpsInLG> | 2, | 3.8565345e-05 | 100.00002 |

PAIR STATISTICS BY GROUP: MEMORY: LOADS VS STORES
5186003 total pairs

| | | | |
|---|---|---|---|
| <loads, | ldstOtherStackAlu> | 586062, 11.300841 | 11.300841 |
| <loads, | loads> | 439097, 8.466964 | 19.767805 |
| <ldstOtherStackAlu, | loads> | 394566, 7.608287 | 27.376091 |
| <stores, | loads> | 383136, 7.387886 | 34.763977 |
| <ldstOtherStackAlu, | stores> | 320004, 6.1705327 | 40.93451 |
| <ldstOtherJumps, | loads> | 257768, 4.970456 | 45.904964 |
| <loads, | ldstOtherJumps> | 244154, 4.707942 | 50.612907 |
| <loads, | ldstOtherImmed> | 208982, 4.0297313 | 54.64264 |
| <ldstOtherStackAlu, | ldstOtherStackAlu> | 191010, 3.6831834 | 58.32582 |
| <ldstOtherImmed, | ldstOtherStackAlu> | 180662, 3.4836464 | 61.809467 |
| <stores, | ldstOtherStackAlu> | 134138, 2.5865393 | 64.396 |
| <ldstOtherXfers, | stores> | 131014, 2.5263 | 66.9223 |
| <ldstOtherImmed, | ldstOtherJumps> | 129871, 2.50426 | 69.42656 |
| <ldstOtherStackAlu, | ldstOtherImmed> | 113904, 2.1963737 | 71.62293 |
| <loads, | stores> | 111815, 2.156092 | 73.77902 |
| <stores, | stores> | 111297, 2.1461036 | 75.925125 |
| <ldstOtherStackAlu, | ldstOtherJumps> | 105683, 2.0378509 | 77.962975 |
| <loads, | ldstOtherXfers> | 91205, 1.7586761 | 79.72165 |
| <ldstOtherJumps, | ldstOtherImmed> | 90169, 1.7386993 | 81.46035 |
| <ldstOther, | loads> | 85874, 1.6558802 | 83.116234 |
| <ldstOtherXfers, | loads> | 74823, 1.4427874 | 84.55902 |
| <ldstOtherImmed, | loads> | 66025, 1.2731384 | 85.83216 |
| <ldstOtherImmed, | ldstOtherXfers> | 60200, 1.1608169 | 86.99298 |
| <stores, | ldstOtherImmed> | 58338, 1.1249126 | 88.1179 |
| <ldstOtherImmed, | stores> | 56050, 1.0807937 | 89.19869 |
| <ldstOtherImmed, | ldstOtherImmed> | 50304, 0.9699956 | 90.168686 |
| <ldstOtherJumps, | ldstOtherStackAlu> | 48764, 0.9403002 | 91.108986 |
| <stores, | ldstOtherJumps> | 48467, 0.93457336 | 92.04356 |
| <stores, | ldstOtherXfers> | 45035, 0.86839514 | 92.91195 |
| <ldstOtherJumps, | stores> | 36171, 0.6974736 | 93.60942 |
| <ldstOtherXfers, | ldstOther> | 33550, 0.64693365 | 94.256355 |
| <ldstOther, | stores> | 32396, 0.6246815 | 94.881035 |
| <ldstOther, | ldstOtherXfers> | 31716, 0.6115693 | 95.49261 |
| <ldstOther, | ldstOther> | 28778, 0.5549168 | 96.04752 |
| <ldstOtherJumps, | ldstOtherXfers> | 27204, 0.5245659 | 96.57209 |
| <ldstOtherJumps, | ldstOtherJumps> | 25748, 0.49649024 | 97.06858 |
| <ldstOtherStackAlu, | ldstOtherXfers> | 24961, 0.4813148 | 97.5499 |
| <ldstOther, | ldstOtherStackAlu> | 22689, 0.43750458 | 97.987404 |
| <loads, | ldstOther> | 18474, 0.3562281 | 98.343636 |
| <stores, | ldstOther> | 18181, 0.35057828 | 98.694214 |
| <ldstOtherStackAlu, | ldstOther> | 15456, 0.298033 | 98.99225 |
| <ldstOther, | ldstOtherImmed> | 15174, 0.2925953 | 99.28484 |
| <ldstOtherXfers, | ldstOtherImmed> | 9472, 0.18264546 | 99.46749 |
| <ldstOtherJumps, | ldstOther> | 6439, 0.124161136 | 99.59165 |
| <ldstOtherXfers, | ldstOtherXfers> | 6045, 0.11656376 | 99.70821 |
| <ldstOtherXfers, | ldstOtherJumps> | 5969, 0.115098286 | 99.82331 |
| <ldstOther, | ldstOtherJumps> | 3610, 0.06961045 | 99.89292 |
| <ldstOtherImmed, | ldstOther> | 3046, 0.058735018 | 99.95166 |
| <ldstOtherXfers, | ldstOtherStackAlu> | 2507, 0.04834166 | 100.0 |

PAIR STATISTICS BY GROUP: ALU INPUTS FOR MEMORY ADDRESS
5186003 total pairs

| | | | |
|---|---|---|---|
| <aiMem2, aiMem2> | 697315, 13.446097 | 13.446097 |
| <aiAlu, aiMem2> | 528058, 10.182369 | 23.628468 |
| <aiMem2, aiAlu> | 459159, 8.853812 | 32.48228 |
| <aiCmplx, aiMem2> | 343734, 6.6281104 | 39.11039 |
| <aiMem2, aiCmplx> | 261229, 5.0371933 | 44.147583 |
| <aiMem2, aiImmed> | 238175, 4.592651 | 48.740234 |
| <aiAluCbr, aiMem2> | 223527, 4.3101983 | 53.050434 |
| <aiMem2, aiAluCbr> | 168313, 3.2455246 | 56.29596 |
| <aiImmed, aiAlu> | 167846, 3.2365196 | 59.53248 |
| <aiAlu, aiAlu> | 136516, 2.6323934 | 62.16487 |
| <aiCmplx, aiAlu> | 125537, 2.4206889 | 64.58556 |
| <aiAlu, aiImmed> | 123501, 2.3814294 | 66.966995 |
| <aiImmed, aiAluCbr> | 114036, 2.1989188 | 69.16592 |
| <aiImmed, aiMem2> | 102362, 1.973813 | 71.13973 |
| <aiMem2Plus,aiAlu> | 102248, 1.9716147 | 73.11134 |
| <aiAlu, aiAluCbr> | 91749, 1.7691659 | 74.88051 |
| <aiAluCbr, aiImmed> | 87251, 1.6824326 | 76.56294 |
| <aiAlu, aiMem2Plus> | 83104, 1.6024673 | 78.16541 |
| <aiImmed, aiCmplx> | 76987, 1.4845152 | 79.649925 |
| <aiMem2, aiMem2Plus> | 68979, 1.3300996 | 80.98003 |
| <aiMem2Plus,aiMem2Plus> | 60089, 1.1586766 | 82.1387 |
| <aiJump, aiMem2> | 58253, 1.1232736 | 83.26198 |
| <aiMem2, aiMem3Plus> | 56899, 1.0971647 | 84.359146 |
| <aiAluPlus, aiMem2Plus> | 54134, 1.0438483 | 85.40299 |
| <aiAlu, aiCmplx> | 53510, 1.0318158 | 86.43481 |
| <aiMem3Plus,aiAluCbr> | 52489, 1.0121282 | 87.44694 |
| <aiImmed, aiImmed> | 50304, 0.9699956 | 88.41693 |
| <aiMem2, aiJump> | 48048, 0.92649384 | 89.34342 |
| <aiMem2Plus,aiMem2> | 46174, 0.89035816 | 90.23378 |
| <aiAluCbr, aiAlu> | 44744, 0.8627839 | 91.096565 |
| <aiAlu, aiAluPlus> | 39715, 0.7658114 | 91.86237 |
| <aiMem2Plus,aiAluPlus> | 27712, 0.5343614 | 92.396736 |
| <aiCmplx, aiAluPlus> | 26834, 0.5174312 | 92.91417 |
| <aiAluCbr, aiCmplx> | 25745, 0.4964324 | 93.4106 |
| <aiAluCbr, aiJump> | 24483, 0.47209768 | 93.8827 |
| <aiAluPlus, aiAlu> | 22996, 0.44342432 | 94.326126 |
| <aiAluPlus, aiMem2> | 22151, 0.42713046 | 94.75326 |
| <aiMem2, aiAluPlus> | 19899, 0.3837059 | 95.13696 |
| <aiMem2Plus,aiAluCbr> | 19594, 0.3778247 | 95.514786 |
| <aiMem2Plus,aiCmplx> | 19392, 0.3739296 | 95.88872 |
| <aiMem3, aiAlu> | 17590, 0.3391822 | 96.2279 |
| <aiAluPlus, aiImmed> | 16771, 0.32338972 | 96.551285 |
| <aiAlu, aiJump> | 15546, 0.29976843 | 96.85105 |
| <aiCmplx, aiImmed> | 15214, 0.29336658 | 97.14442 |
| <aiImmed, aiJump> | 14772, 0.28484364 | 97.42926 |
| <aiMem2, aiMem3> | 14555, 0.2806593 | 97.70992 |
| <aiCmplx, aiCmplx> | 14155, 0.27294624 | 97.98287 |
| <aiAlu, aiMem3> | 12259, 0.2363863 | 98.21926 |
| <aiAluCbr, aiMem2Plus> | 11144, 0.2148861 | 98.43415 |
| <aiMem3, aiMem2> | 10889, 0.20996902 | 98.64412 |
| <aiMem2Plus,aiImmed> | 9215, 0.17768981 | 98.82181 |
| <aiImmed, aiMem2Plus> | 7633, 0.14718466 | 98.968994 |
| <aiJump, aiAlu> | 6941, 0.13384104 | 99.10284 |
| <aiImmed, aiAluPlus> | 6099, 0.11760503 | 99.22044 |
| <aiCmplx, aiAluCbr> | 6059, 0.11683371 | 99.33728 |
| <aiImmed, aiMem3> | 5161, 0.09951787 | 99.4368 |
| <aiJump, aiCmplx> | 4977, 0.09596986 | 99.53277 |
| <aiMem3, aiCmplx> | 3753, 0.07236788 | 99.60513 |
| <aiAluPlus, aiAluCbr> | 3088, 0.059544897 | 99.66468 |
| <aiMem3Plus,aiImmed> | 3077, 0.05933278 | 99.724014 |
| <aiJump, aiImmed> | 2752, 0.053065915 | 99.77708 |
| <aiCmplx, aiJump> | 1943, 0.037466235 | 99.814545 |
| <aiMem3Plus,aiMem2> | 1589, 0.030640168 | 99.845184 |
| <aiJump, aiAluCbr> | 1230, 0.023717687 | 99.868904 |
| <aiMem3Plus,aiAlu> | 1147, 0.022117226 | 99.89102 |
| <aiMem2Plus,aiMem3> | 985, 0.018993435 | 99.91002 |
| <aiImmed, aiMem3Plus> | 958, 0.0184728 | 99.92849 |
| <aiAluPlus, aiCmplx> | 650, 0.012533737 | 99.941025 |
| <aiAlu, aiMem3Plus> | 532, 0.010258383 | 99.95129 |
| <aiAluPlus, aiJump> | 444, 0.008561507 | 99.95985 |
| <aiMem3, aiMem2Plus> | 338, 0.006517544 | 99.96636 |
| <aiMem2Plus,aiJump> | 321, 0.006189738 | 99.97255 |

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<aiMem3Plus,aiMem2Plus>      308, 0.005939063   99.978485
<aiMem3,     aiAluCbr>       299, 0.0057655196  99.98425
<aiMem2Plus,aiMem3Plus>      265, 0.0051099086  99.989365
<aiCmplx,    aiMem2Plus>     239, 0.004608559   99.99397
<aiJump,     aiMem2Plus>     147, 0.0028345528  99.99681
<aiMem3,     aiImmed>         83, 0.001600462   99.99841
<aiMem3,     aiMem3>          21, 4.0493612e-04 99.99882
<aiMem3Plus,aiJump>           16, 3.0852275e-04 99.99912
<aiMem3Plus,aiMem3Plus>       15, 2.8924012e-04 99.99941
<aiMem3,     aiJump>           9, 1.7354406e-04 99.99959
<aiCmplx,    aiMem3Plus>       7, 1.3497871e-04 99.999725
<aiJump,     aiMem3>           7, 1.3497871e-04 99.99986
<aiCmplx,    aiMem3>           5, 9.6413364e-05 99.99996
<aiMem3Plus,aiCmplx>           4, 7.713069e-05  100.00004
```

OPCODES SORTED BY SINGLE OCCURENCE FREQUENCY

| Opcode | Count | Per Cent | Cum Percent |
|---|---|---|---|
| LLDB | 730510, | 7.0430927 | 7.0430927 |
| LLO | 662410, | 6.3865175 | 13.42961 |
| SLDB | 533914, | 5.1476445 | 18.577255 |
| PUSH | 511092, | 4.92761 | 23.504866 |
| LIB | 476775, | 4.5967484 | 28.101614 |
| LIO | 406245, | 3.916745 | 32.01836 |
| RILP | 322109, | 3.1055613 | 36.12392 |
| JZNEB | 314475, | 3.0319593 | 38.15588 |
| NILCKL | 276181, | 2.6627538 | 40.818634 |
| MUL | 269746, | 2.600712 | 43.419346 |
| RET | 252951, | 2.4387858 | 45.85813 |
| ADD | 241286, | 2.3263195 | 48.184452 |
| JZEQB | 197166, | 1.9009438 | 50.085396 |
| RO | 190646, | 1.8380823 | 51.923477 |
| LL2 | 182944, | 1.7638247 | 53.6873 |
| LL1 | 161270, | 1.5548583 | 55.24216 |
| LL3 | 154693, | 1.4914472 | 56.73361 |
| RDBL | 152282, | 1.468202 | 58.20181 |
| SUB | 144918, | 1.3972032 | 59.59901 |
| RSTR | 141716, | 1.3663316 | 60.965343 |
| BNDCK | 137810, | 1.3286725 | 62.294018 |
| SL1 | 137125, | 1.3220682 | 63.616085 |
| LIW | 129069, | 1.2443976 | 64.86048 |
| INC | 126437, | 1.2190217 | 66.079506 |
| LL5 | 126408, | 1.218742 | 67.29825 |
| WILP | 119595, | 1.1530557 | 68.4513 |
| NILCK | 119508, | 1.1522168 | 69.603516 |
| PLO | 118345, | 1.141004 | 70.74452 |
| SLO | 117019, | 1.1282195 | 71.87274 |
| SL5 | 114804, | 1.106864 | 72.97961 |
| RF | 114133, | 1.1003947 | 74.08 |
| JB | 109355, | 1.0543283 | 75.13433 |
| JLB | 105863, | 1.0206608 | 76.15499 |
| z377 | 104826, | 1.0106628 | 77.16566 |
| DADD | 93228, | 0.8988425 | 78.0645 |
| EXCH | 90807, | 0.87550087 | 78.94 |
| KFCB | 86379, | 0.83280907 | 79.77281 |
| OR | 84359, | 0.8133335 | 80.58614 |
| DUCOMP | 79424, | 0.7657535 | 81.3519 |
| LADRB | 78552, | 0.75734625 | 82.109245 |
| SFC | 73761, | 0.71115465 | 82.8204 |
| SLB | 66245, | 0.6386904 | 83.45908 |
| LL4 | 64520, | 0.62205906 | 84.08115 |
| SL4 | 61076, | 0.58885427 | 84.67 |
| DUP | 61055, | 0.58865175 | 85.25865 |
| JGB | 59107, | 0.5698705 | 85.82852 |
| JULEB | 56203, | 0.541872 | 86.37039 |
| LINKB | 53643, | 0.5171902 | 86.88758 |
| LGDB | 51178, | 0.49342432 | 87.381004 |
| LI1 | 50230, | 0.48428435 | 87.86529 |
| LLB | 47482, | 0.45778995 | 88.323074 |
| PL2 | 45334, | 0.43708034 | 88.760155 |
| SL2 | 43768, | 0.421982 | 89.18214 |
| JULB | 41564, | 0.40073252 | 89.58287 |
| LGB | 40880, | 0.39413786 | 89.977005 |
| JW | 37262, | 0.35925546 | 90.33626 |
| GADRB | 34990, | 0.33735037 | 90.67361 |
| SL3 | 33532, | 0.3232933 | 90.9969 |
| WSDB | 32621, | 0.31451 | 91.31141 |
| WDBL | 32349, | 0.3118876 | 91.6233 |
| JEQB | 30005, | 0.2892883 | 91.91259 |
| RFL | 29440, | 0.28384094 | 92.196434 |
| RSTRL | 26954, | 0.25987258 | 92.45631 |
| WFL | 25939, | 0.25008664 | 92.70639 |
| LFC4 | 25896, | 0.24967206 | 92.95606 |
| RILO | 25060, | 0.24161191 | 93.19768 |
| MISC | 22733, | 0.2191765 | 93.416855 |
| DBL | 22499, | 0.21692042 | 93.63377 |
| RDO | 22434, | 0.21629376 | 93.85007 |
| LL6 | 22048, | 0.2125722 | 94.06264 |
| J2 | 21769, | 0.20988224 | 94.27252 |
| SL6 | 21704, | 0.20925555 | 94.48178 |
| RXLP | 21395, | 0.2062764 | 94.68806 |

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| JGLB | 20465, 0.19730996 | 94.88537 |
| LFC11 | 18720, 0.18048582 | 95.06586 |
| RDB | 18369, 0.17710172 | 95.24296 |
| PL3 | 18356, 0.17697639 | 95.41994 |
| AND | 18124, 0.17473959 | 95.59467 |
| POP | 18115, 0.17465281 | 95.769325 |
| RIGP | 17154, 0.16538749 | 95.934715 |
| XOR | 16415, 0.15826255 | 96.09298 |
| LG1 | 15664, 0.1510219 | 96.244 |
| EFC5 | 15544, 0.14986494 | 96.39387 |
| LFCB | 15175, 0.14630729 | 96.54018 |
| LFC1 | 14563, 0.14040679 | 96.68058 |
| JNEB | 13564, 0.1307751 | 96.811356 |
| LG2 | 13340, 0.12861543 | 96.93997 |
| LG4 | 12694, 0.12238712 | 97.06236 |
| WSTR | 12322, 0.118800545 | 97.18116 |
| WDO | 12191, 0.11753752 | 97.2987 |
| JNE7 | 11798, 0.11374849 | 97.412445 |
| SGB | 10182, 0.09816809 | 97.51061 |
| LI2 | 10177, 0.09811989 | 97.608734 |
| DESCB | 9762, 0.09411873 | 97.70285 |
| LI4 | 9734, 0.09384877 | 97.7967 |
| JNE4 | 9684, 0.0933667 | 97.89007 |
| PL1 | 9600, 0.09255683 | 97.98263 |
| EFC1 | 8686, 0.08374464 | 98.066376 |
| LFC2 | 8195, 0.07901075 | 98.145386 |
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| LFC8 | 7332, 0.070690274 | 98.36717 |
| LGO | 7286, 0.07024678 | 98.437416 |
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| LSTF | 7079, 0.06825102 | 98.57395 |
| DST | 7070, 0.06816425 | 98.64211 |
| LFC3 | 6777, 0.06533934 | 98.70745 |
| WSTRL | 5858, 0.056478953 | 98.76393 |
| LDIV | 5428, 0.052333174 | 98.81626 |
| FREE | 4316, 0.041612005 | 98.85787 |
| ALLOC | 4290, 0.041361332 | 98.89923 |
| RBL | 4158, 0.040088682 | 98.93932 |
| LG3 | 4150, 0.04001155 | 98.97933 |
| BLT | 3958, 0.03816041 | 99.017494 |
| WO | 3920, 0.03779404 | 99.05529 |
| LG5 | 3874, 0.037350538 | 99.09264 |
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| SHIFT | 3572, 0.03443885 | 99.19943 |
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| WBL | 3095, 0.029839935 | 99.26258 |
| LFC9 | 3046, 0.029367509 | 99.29195 |
| LL7 | 2991, 0.028837237 | 99.320786 |
| LFC14 | 2986, 0.028789032 | 99.34957 |
| EFCO | 2964, 0.02857692 | 99.37815 |
| LFC5 | 2882, 0.027786331 | 99.40594 |
| JUGEB | 2864, 0.027612786 | 99.43355 |
| CATCH | 2824, 0.027227135 | 99.46078 |
| R1 | 2742, 0.026436543 | 99.48721 |
| R4 | 2704, 0.026070175 | 99.51328 |
| JUGB | 2628, 0.025337431 | 99.53862 |
| LI3 | 2454, 0.02365984 | 99.56228 |
| MRE | 2454, 0.02365984 | 99.58594 |
| WSF | 2396, 0.02310064 | 99.60904 |
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| JIW | 2125, 0.020487838 | 99.7205 |
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| MXW | 1919, 0.018501725 | 99.75789 |
| J9 | 1748, 0.016853057 | 99.77474 |
| JEQ4 | 1512, 0.014577701 | 99.78932 |
| SL7 | 1474, 0.01421133 | 99.803535 |
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| J4 | 1152, 0.01110682 | 99.82633 |
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| LFC16 | 876, | 0.00844581 | 99.860664 |
| JNE3 | 868, | 0.00836868 | 99.86903 |
| JNE9 | 785, | 0.007568449 | 99.8766 |
| WSB | 714, | 0.0068839145 | 99.883484 |
| JNE5 | 702, | 0.006768218 | 99.89025 |
| JEQ7 | 697, | 0.0067200127 | 99.89697 |
| LLKB | 674, | 0.0064982605 | 99.90347 |
| WXLP | 662, | 0.0063825645 | 99.90986 |
| WF | 642, | 0.006189738 | 99.916046 |
| JLEB | 609, | 0.0058715734 | 99.92192 |
| LFC10 | 606, | 0.00584265 | 99.927765 |
| LI6 | 602, | 0.005804085 | 99.93357 |
| LP | 562, | 0.0054184313 | 99.93899 |
| LFC13 | 511, | 0.004926723 | 99.94392 |
| LFC12 | 457, | 0.0044060907 | 99.948326 |
| JEQ3 | 428, | 0.004126492 | 99.95245 |
| JNE6 | 405, | 0.0039047413 | 99.95636 |
| R2 | 362, | 0.0034901638 | 99.95985 |
| WS0 | 302, | 0.0029116836 | 99.96276 |
| RILPL | 294, | 0.0028345528 | 99.9656 |
| DCOMP | 286, | 0.0027574224 | 99.96835 |
| JEQ8 | 284, | 0.0027381396 | 99.97109 |
| BLTC | 282, | 0.0027188568 | 99.97381 |
| SG3 | 224, | 0.0021596594 | 99.97597 |
| EFC9 | 206, | 0.0019861153 | 99.97795 |
| EFC8 | 202, | 0.0019475498 | 99.9799 |
| EFC2 | 186, | 0.0017932885 | 99.98169 |
| J5 | 158, | 0.0015233312 | 99.983215 |
| RFC | 150, | 0.0014462005 | 99.984665 |
| LG7 | 148, | 0.0014269176 | 99.98609 |
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| EFC10 | 111, | 0.0010701884 | 99.991165 |
| EFC11 | 111, | 0.0010701884 | 99.99223 |
| EFC14 | 111, | 0.0010701884 | 99.9933 |
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| LFC6 | 100, | 9.6413374e-04 | 99.996284 |
| JEQ9 | 96, | 9.255684e-04 | 99.99721 |
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| SG1 | 10, | 9.6413364e-05 | 99.99957 |
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| MXD | 4, | 3.8565345e-05 | 99.99991 |
| ME | 4, | 3.8565345e-05 | 99.99995 |
| EFC12 | 3, | 2.8924012e-05 | 99.99998 |
| LFC15 | 2, | 1.9282673e-05 | 100.0 |
| LST | 1, | 9.641336e-06 | 100.00001 |
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PAIRWISE FREQUENCIES

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| <RET,LLO> | 68543 | 0.6608462 | 4.220206 |
| <LLO,RF> | 53894 | 0.51961017 | 4.739816 |
| <LIB,SUB> | 53347 | 0.5143364 | 5.2541523 |
| <LLDB,RET> | 52685 | 0.50795383 | 5.762106 |
| <JZNEB,LLO> | 50528 | 0.48715744 | 6.2492633 |
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| <LIW,RO> | 49561 | 0.47783427 | 7.2142167 |
| <RO,JZNEB> | 48999 | 0.47241583 | 7.686633 |
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| <SLDB,SLDB> | 43606 | 0.42042012 | 9.465585 |
| <DADD,SLDB> | 42916 | 0.41376758 | 9.879353 |
| <LIO,KFCB> | 41999 | 0.4049265 | 10.284279 |
| <LLO,LL2> | 41296 | 0.39814865 | 10.682427 |
| <LL5,ADD> | 41090 | 0.3961625 | 11.07859 |
| <LLO,LL3> | 40930 | 0.39461992 | 11.473209 |
| <MUL,PUSH> | 40899 | 0.39432098 | 11.867531 |
| <ADD,SL5> | 40874 | 0.39407997 | 12.26161 |
| <JZEQB,LLDB> | 40821 | 0.393569 | 12.655179 |
| <SL5,LLDB> | 40791 | 0.39327974 | 13.04846 |
| <MUL,LL5> | 40775 | 0.39312551 | 13.441585 |
| <SUB,LIO> | 40775 | 0.39312551 | 13.83471 |
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| <LIB,JLB> | 40664 | 0.39205532 | 16.97715 |
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| <EXCH,RSTR> | 39529 | 0.38111238 | 17.74112 |
| <KFCB,SLDB> | 37376 | 0.3603546 | 18.101475 |
| <OR,JZEQB> | 36965 | 0.356392 | 18.457867 |
| <SL1,PLO> | 36683 | 0.35367317 | 18.811539 |
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| <z377,LLDB> | 27182 | 0.26207085 | 22.036276 |
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| <LL1,NILCK> | 26454 | 0.2550519 | 22.546381 |
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| <LIB,JGB> | 26442 | 0.25493622 | 23.056332 |
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| <RSTR,WILP> | 26331 | 0.253866 | 24.325853 |
| <RILP,RSTR> | 26330 | 0.2538564 | 24.57971 |
| <RO,JULEB> | 26328 | 0.2538371 | 24.833546 |
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| <SFC,LINKB> | 26185 | 0.25245838 | 25.339832 |
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| <LL1,RILP> | 24326 | 0.23453517 | 26.313309 |
| <SL4,LL1> | 24156 | 0.23289611 | 26.546204 |
| <LL4,EXCH> | 24144 | 0.23278043 | 26.778988 |
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| <SL1,LL0> | 20430 | 0.19697251 | 28.289774 |
| <SLDB,JB> | 20388 | 0.19656758 | 28.486341 |
| <JGB,LLDB> | 20314 | 0.19585411 | 28.682196 |
| <JZNEB,LLDB> | 19443 | 0.1874565 | 28.869652 |
| <LLDB,DUCOMP> | 19398 | 0.18702264 | 29.056675 |
| <NILCK,R0> | 18821 | 0.1814596 | 29.238134 |
| <LGDB,DUCOMP> | 18599 | 0.17931921 | 29.417452 |
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| <LI0,DUP> | 16551 | 0.15957377 | 29.738703 |
| <WSDB,PUSH> | 16254 | 0.15671028 | 29.895412 |
| <NILCKL,WDBL> | 16176 | 0.15595825 | 30.05137 |
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| <SL0,LL2> | 15765 | 0.15199567 | 30.358013 |
| <LL3,JULB> | 15592 | 0.15032773 | 30.508343 |
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| <LI0,SL1> | 14465 | 0.13946194 | 31.075928 |
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| <SUB,PL2> | 13987 | 0.13485337 | 31.62505 |
| <WDBL,LLDB> | 13700 | 0.1320863 | 31.757133 |
| <NILCKL,LL0> | 13471 | 0.12987845 | 31.887012 |
| <LL0,RSTRL> | 13471 | 0.12987845 | 32.01689 |
| <R0,LL0> | 13341 | 0.12862506 | 32.14552 |
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| <LL0,RILP> | 13130 | 0.12659074 | 32.657597 |
| <SL5,LL0> | 13126 | 0.12655218 | 32.78415 |
| <BNDCK,LL5> | 13107 | 0.126369 | 32.91052 |
| <NILCK,SL5> | 13107 | 0.126369 | 33.03689 |
| <LL5,EXCH> | 13106 | 0.12635936 | 33.163246 |
| <NILCKL,WFL> | 12968 | 0.12502886 | 33.288277 |
| <INC,LIB> | 12930 | 0.124662495 | 33.41294 |
| <LL1,INC> | 12314 | 0.11872342 | 33.531662 |
| <JB,SL1> | 12268 | 0.11827991 | 33.64994 |
| <LIB,MUL> | 12267 | 0.118270266 | 33.76821 |
| <BNDCK,SL1> | 12266 | 0.11826063 | 33.88647 |
| <SUB,SL0> | 12128 | 0.11693014 | 34.003403 |
| <JLB,LL1> | 12122 | 0.116872275 | 34.120277 |
| <RSTR,ADD> | 12072 | 0.11639022 | 34.236668 |
| <MUL,LL2> | 12068 | 0.11635165 | 34.35302 |
| <INC,LL3> | 12067 | 0.116341996 | 34.46936 |
| <LI0,SLB> | 12034 | 0.11602384 | 34.585384 |
| <LL0,INC> | 11774 | 0.11351709 | 34.698902 |
| <DUCOMP,JZEQB> | 11766 | 0.113439965 | 34.81234 |
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| <LLDB,WSDB> | 10700 | 0.1031623 | 35.344955 |
| <PL2,JZNEB> | 10615 | 0.102342784 | 35.4473 |
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| <LGB,JZEQB> | 10096 | 0.097338924 | 36.145638 |
| <JB,SL0> | 9787 | 0.09435976 | 36.239998 |
| <SLDB,LGB> | 9745 | 0.09395483 | 36.333954 |
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| <RDB,SLDB> | 9153 | 0.08824715 | 36.77963 |
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| <ADD,RD0> | 9102 | 0.08775545 | 36.95559 |
| <JB,LL0> | 9072 | 0.08746621 | 37.043056 |
| <JZNEB,LI0> | 9043 | 0.0871866 | 37.13024 |
| <LADRB,LI0> | 8630 | 0.08320474 | 37.213448 |

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| <LIB,AND> | 8479 | 0.081748896 | 37.295197 |
| <JZEQB,RIL0> | 8409 | 0.081074 | 37.37627 |
| <RFL,JZNEB> | 8281 | 0.07983991 | 37.456112 |
| <SL0,LI0> | 8059 | 0.07769954 | 37.53381 |
| <SLB,LI0> | 8025 | 0.07737172 | 37.61118 |
| <SL2,LLDB> | 7915 | 0.07631118 | 37.687492 |
| <LL0,SL2> | 7909 | 0.07625332 | 37.763744 |
| <PL0,LFC1> | 7875 | 0.07592553 | 37.839672 |
| <LI0,LFC4> | 7843 | 0.075617 | 37.91529 |
| <SFC,SL0> | 7743 | 0.07465286 | 37.98994 |
| <EFC5,LI0> | 7716 | 0.07439255 | 38.064335 |
| <LFC4,PL0> | 7680 | 0.07404547 | 38.138382 |
| <LI1,SUB> | 7614 | 0.07340914 | 38.21179 |
| <LI0,J2> | 7571 | 0.07299456 | 38.284786 |
| <LI0,JLB> | 7490 | 0.07221361 | 38.356995 |
| <JZEQB,LI1> | 7483 | 0.07214612 | 38.429146 |
| <JZNEB,JB> | 7163 | 0.06906089 | 38.498203 |
| <LI0,SL0> | 7160 | 0.06903196 | 38.567238 |
| <z377,LLB> | 7149 | 0.068925915 | 38.63616 |
| <DUP,RET> | 7059 | 0.068058195 | 38.70422 |
| <LL0,LIW> | 7059 | 0.068058195 | 38.772278 |
| <JLB,LI0> | 7058 | 0.06804855 | 38.84033 |
| <z377,SLDB> | 6784 | 0.06540682 | 38.905735 |
| <SL0,EFC5> | 6660 | 0.0642113 | 38.969948 |
| <RIGP,SFC> | 6653 | 0.06414381 | 39.03409 |
| <LG1,RIGP> | 6633 | 0.06395099 | 39.098038 |
| <WFL,LLDB> | 6396 | 0.061665988 | 39.159706 |
| <WILP,RET> | 6285 | 0.0605958 | 39.2203 |
| <LI1,LLDB> | 6247 | 0.060229425 | 39.28053 |
| <LLDB,LGDB> | 6142 | 0.05921709 | 39.33975 |
| <PUSH,INC> | 6064 | 0.05846507 | 39.398212 |
| <RET,RET> | 5797 | 0.055890827 | 39.4541 |
| <SLB,LADRB> | 5739 | 0.055331635 | 39.509438 |
| <JZNEB,JW> | 5728 | 0.055225573 | 39.56466 |
| <ADD,SL0> | 5620 | 0.054184313 | 39.618843 |
| <LLB,JZEQB> | 5600 | 0.053991485 | 39.672836 |
| <SLDB,LI0> | 5585 | 0.053846865 | 39.726685 |
| <EXCH,POP> | 5564 | 0.053644395 | 39.780327 |
| <PUSH,EXCH> | 5564 | 0.053644395 | 39.833973 |
| <SL1,EFC1> | 5437 | 0.05241995 | 39.88639 |
| <LL3,LIB> | 5268 | 0.050790558 | 39.937183 |
| <JW,PUSH> | 5225 | 0.050375986 | 39.987556 |
| <OR,JZNEB> | 5213 | 0.050260296 | 40.03782 |

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