| | | |
|---|---|---|
| 02 | ⊖ | pop |
| 01 | ⊕ | `push + a` |
| 04 | ⊕ | divine |
| 05 | ⊕ | `dup + i` |
| 09 | | `swap + i` |
| 08 | ○ | nop |
| 06 | ⊖ | `skiz` |
| 13 | ○ | `call + d` |
| 12 | ○ | `return` |
| 16 | ○ | `recurse` |
| 10 | ⊖ | assert |
| 00 | ○ | halt |
| 20 | ⊙ | read_mem |
| 24 | ○ | write_mem |
| 28 | | hash |
| 32 | | divine_sibling   st12 % 2 = 0 ⇒ left node |
| 36 | ○ | assert_vector |
| 14 | ⊙ | add |
| 18 | ⊙ | mul |
| 40 | ⊙ | invert |
| 44 | | split           hi → st0' |
| 22 | ⊙ | eq |
| 72 | | lsb |
| 56 | | xxadd |
| 60 | | xxmul |
| 64 | | xinv |
| 38 | ● | xbmul           st0 · (st1, st2, st3) |
| 68 | ⊕ | read_io |
| 42 | ⊖ | write_io |

input    program    output

instruction

processor

opStack    RAM    jumpStack
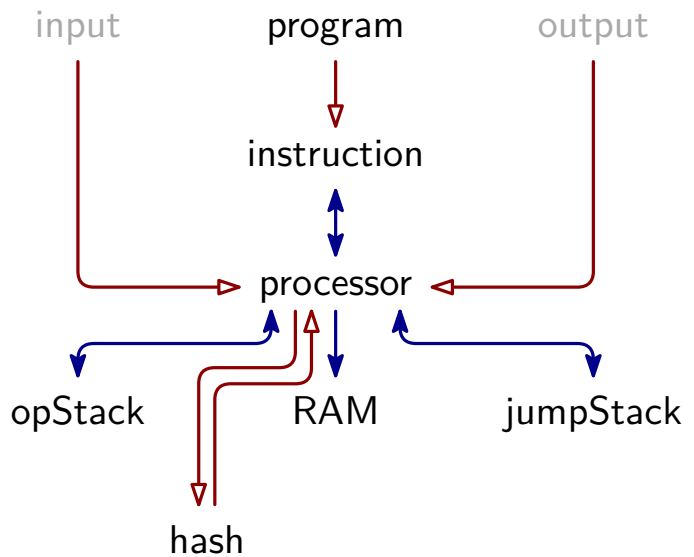
hash

$p = 18446744069414584321$

| $i$ | $1/i$ | $-1/i$ |
|---|---|---|
| 2 | 092…161 | 922…160 |
| 3 | 122…881 | 614…440 |
| 4 | 138…241 | 461…080 |
| 5 | 147…457 | 368…864 |
| 6 | 153…601 | 307…720 |

| | base | ext | $\sum$ |
|---|---|---|---|
| Program | 3 | 1 | 4 |
| Instruction | 4 | 2 | 6 |
| Processor | 38 | 8 | 46 |
| OpStack | 4 | 1 | 5 |
| RAM | 4 | 1 | 5 |
| JumpStack | 5 | 1 | 6 |
| Hash | 49 | 2 | 51 |
| $\sum$ | 107 | 16 | 123 |

| Table | | Base Columns | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Program | Address | | | | Instruction | | IsPadding | | | | | | | | | | | | | | | |
| Instruction | Address | | | | CI | NIA | IsPadding | | | | | | | | | | | | | | | |
| Processor | CLK | IsPadding | IP | CI | NIA | | IB0 | ... | IB6 | JSP | JSO | JSD | ST0 | ... | ST15 | OSP | OSV | HV0 | ... | HV3 | RAMV | RAMP |
| OpStack | CLK | | | | | | IB1 ($\widehat{=}$ shrink stack) | | | | | | | | | OSP | OSV | | | | | |
| RAM | CLK | | | | | | | | | | | | RAMP | | | | | | | | RAMV | IORD |
| JumpStack | CLK | | | | CI | | | | | JSP | JSO | JSD | | | | | | | | | | |
| Hash | RoundNumber | | | | | | | | | | | | ST0 | ... | ST15 | CONSTANT0A | | | ... | CONSTANT15B | | |

| #clk | instruction |
|---|---|
| 2 | neg |
| 4 | sub |
| 68 | is_u32 |
| 139 | split_assert |
| 146 | lte |
| 148 | lt |
| 295 | and |
| 301 | xor |
| 195 | reverse |
| 164 | div |