|  |
| --- |
|  |
| Data Dictionary for SMLOpCodes.h |
|  |
|  |
| **Andrew Laing** |
| **23/10/2017** |

SML Opcodes

SML instructions are 6 digits long with the first two digits representing the Operation codes, and the remaining digits a position in Memory. (An SML machine has a virtual memory capable of storing 1000 6-digit numbers, including variables and constants.)

|  |  |  |
| --- | --- | --- |
| **SML Opcodes** | | |
| **Name** | **Value** | **Description** |
| READ | 10 | Used to read an integer from STDIN to a specified memory location. |
| WRITE | 11 | Used to write an integer from a specified memory location to STDOUT |
| NEWLINE | 12 | Used to write a Newline character to STDOUT. |
| READFLOAT | 13 | Used to read a float from STDIN to a specified memory location. |
| WRITEFLOAT | 14 | Used to write a float from a specified memory location to STDOUT |
| READSTRING | 15 | Used to read a string from STDIN to a specified memory location. |
| WRITESTRING | 16 | Used to write a string from a specified memory location to STDOUT |
| LOAD | 20 | Used to load an integer from a specified memory location into the Accumulator. |
| STORE | 21 | Used to store the value currently in the Accumulator to a specified Memory location. |
| LOADFLOAT | 22 | Used to load a float from a specified memory location into the Float Accumulator. |
| STOREFLOAT | 23 | Used to store the value currently in the Float Accumulator to a specified Memory location. |
| ADD | 30 | Used to add the value stored at the specified Memory location to the value currently in the Accumulator. |
| SUBTRACT | 31 | Used to subtract the value stored at the specified Memory location from the value currently in the Accumulator. |
| DIVIDE | 32 | Used to divide the value currently in the Accumulator by the value stored at the specified Memory location. |
| MULTIPLY | 33 | Used to multiply the value currently in the Accumulator by the value stored at the specified Memory location. |
| MODULUS | 34 | Used to modulo the value currently in the Accumulator by the value stored at the specified Memory location. |
| EXPONENTIATION | 35 | Used to raise the value currently in the Accumulator to the power of the value stored at the specified Memory location. |
| ADDFLOAT | 36 | Used to add the value stored at the specified Memory location to the value currently in the Float Accumulator. |
| SUBTRACTFLOAT | 37 | Used to subtract the value stored at the specified Memory location from the value currently in the Float Accumulator. |
| DIVIDEFLOAT | 38 | Used to divide the value currently in the Float Accumulator by the value stored at the specified Memory location. |
| MULTIPLYFLOAT | 39 | Used to multiply the value currently in the Float Accumulator by the value stored at the specified Memory location. |
| MODULUSFLOAT | 40 | Used to modulo the value currently in the Float Accumulator by the value stored at the specified Memory location. |
| BRANCH | 50 | Used to branch the flow of execution to the instruction at the specified Memory location. |
| BRANCHNEG | 51 | Used to branch the flow of execution to the instruction at the specified Memory location if the value in the Accumulator is negative. |
| BRANCHZERO | 52 | Used to branch the flow of execution to the instruction at the specified Memory location if the value in the Accumulator is equal to zero. |
| BRANCHPOS | 53 | Used to branch the flow of execution to the instruction at the specified Memory location if the value in the Accumulator is positive. |
| HALT | 54 | Used to halt execution of the program. |