**My CPU**

Memory

Processor

Program Counter

(needs pointer) Accumulator

0

1

2

3

4

5

6

7

8

9

10

Instruction Set

0XX means **H**a**LT** – just stop everything

1XX means **ADD** something to the number in the accumulator (value in memory location XX)

2XX means **SUB**tract something from the number in the accumulator (value in memory location XX)

3XX means **ST**ore whatever is in the **A**ccumulator somewhere (in memory location XX)

4XX is a secret, don’t ask

5XX means **L**oa**D** something into the **A**ccumulator overwriting its contents (from memory location XX)

6XX means **BRA**nch to somewhere (do this branch by setting the PC to XX)

7XX means **BR**anch if the accumulator contains exactly **Z**ero (do this branch by setting the PC to XX)

8XX means **BR**anch if the accumulator is **P**ositive (zero is also +ive) (do this branch by setting PC to XX)

9XX means **INP**ut if XX = 01 or **OUT**put if XX = 02

**Example**: 512 would mean put the contents of memory space 12 into the accumulator.

**Example**: 901 means the user writes a number of their choice in the accumulator.

**Example**: 709 means if the accumulator value is zero set the program counter to 09.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 00 | 01 | 02 | 03 | 04 | 05 | 06 |
| 07 | 08 | 09 | 10 | 11 | 12 | 13 |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 | 30 | 31 | 32 | 33 | 34 |
| 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| 42 | 43 | 44 | 45 | 46 | 47 | 48 |

Remember – when you write to memory you overwrite what was there before, when you read from memory you deliver a copy and the original is still there in memory.

Output