**LMC Assembly Examples:**

**Add Input to 10:**

|  |  |
| --- | --- |
| **Assembly** | **Meaning** |
| INP | *Get input into accumulator* |
| ADD TEN | *Add value in location TEN to accumulator* |
| OUT | *Output current value* |
| HLT | *End program* |
| TEN DAT 10 | *This is location TEN - it starts as 10* |

**Count Forever:**

|  |  |
| --- | --- |
| **Assembly** | **Meaning** |
| LDA ZERO | *Load the value from locaiton ZERO into accumulator* |
| LOOPSTART ADD ONE | *This is called LOOPSTART. Add the value from location ONE to the accumulator* |
| OUT | *Output current value* |
| BRA LOOPSTART | *Always branch back to the location called LOOPSTART* |
| HLT | *End program* |
| ZERO DAT 0 | *This is the location ZERO - it starts with value 0* |
| ONE DAT 1 | *This is the location ONE - it starts with value 1* |

**Subtract input from 10:**

|  |  |
| --- | --- |
| **Assembly** | **Meaning** |
| INP | *Get input into the accumulator* |
| STA FIRST | *Store accumulator into location called FIRST* |
| LDA TEN | *Load the value from location TEN into accumulator* |
| SUB FIRST | *Subtract value from FIRST from accumulator* |
| OUT | *Output accumulator's current value* |
| HLT | *End Program* |
| TEN DAT 10 | *This is location TEN - it starts with value 10* |
| FIRST DAT 0 | *This is location FIRST - it starts with value 0* |

**Calculate perimeter of rectangle:**

|  |  |
| --- | --- |
| **Assembly** | **Meaning** |
| INP | *Get input into accumulator* |
| STA HEIGHT | *Store accumulator into location HEIGHT* |
| INP | *Get input into accumulator* |
| STA WIDTH | *Store accumulator into location WIDTH* |
| LDA WIDTH | *Load value from location WIDTH into accumulator  (Not really needed – width already there)* |
| ADD WIDTH | *Add value from WIDTH to current accumulator value* |
| ADD HEIGHT | *Add value from HEIGHT to current accumulator value* |
| ADD HEIGHT | *Add value from HEIGHT to current accumulator value* |
| OUT | *Output current accumulator value* |
| HLT | *End program* |
| HEIGHT DAT 0 | *This is location HEIGHT - it starts with value 0* |
| WIDTH DAT 0 | *This is location WIDTH - it starts with value 0* |

**Decide if two numbers are the same:**

|  |  |
| --- | --- |
| **Assembly** | **Meaning** |
| INP | *Get input into accumulator* |
| STA FIRST | *Store accumulator into location FIRST* |
| INP | *Get input into accumulator* |
| SUB FIRST | *Subtract value from location FIRST from current value (current value is second input)* |
| BRZ SAME | *If current value is 0, jump to location SAME* |
| LDA ZERO | *Load value from location ZERO into accumulator* |
| BRA END | *Always jump to location END* |
| SAME LDA ONE | *This is location SAME. Load the value from location ONE* |
| END OUT | *This is location END. Output current value (current value is either 1 or 0, based on which branch we took)* |
| HLT | *End program* |
| FIRST DAT 0 | *This is location FIRST. It starts with value 0* |
| ONE DAT 1 | *This is location ONE. It starts with value 1* |
| ZERO DAT 0 | *This is location called ZERO. It starts with value 0* |

Red lines are executed only if values are same

Blue lines are executed only if values different

Purple lines are run in both cases