The Little Man Computer – Sheet 1

#### Programming the Little Man Computer

#### 1 The example program

When you load the LMC there is already a program in the computer. The program is written out in the table below in machine code. By executing the program and using the list of instructions, work out what the program does.

|  |  |  |
| --- | --- | --- |
| **Address** | **Instruction** | **What it does:** |
| 00 | 901 |  |
| 01 | 399 |  |
| 02 | 901 |  |
| 03 | 199 |  |
| 04 | 902 |  |
| 05 | 000 |  |

The Little Man Computer – Reference

The little man’s instruction set: These are all the instructions the little man can execute.

|  |  |  |
| --- | --- | --- |
| Instruction | Mnemonic | MachineCode |
| Load | LDA | 5xx |
| Store | STA | 3xx |
| Add | ADD | 1xx |
| Subtract | SUB | 2xx |
| Input | INP | 901 |
| Output | OUT | 902 |
| End | HLT | 000 |
| Branch if zero | BRZ | 7xx |
| Branch if zero or positive | BRP | 8xx |
| Branch always | BRA | 6xx |
| Data storage | DAT |  |

xx refers to a Mailbox number (Memory Address)

The Little Man Computer – Extension

#### 1 Add 3 numbers

Write a program to add 3 numbers

Note down any initial data:

|  |  |  |
| --- | --- | --- |
| Address | Value | Comment |
|  |  |  |
|  |  |  |
|  |  |  |

And also the program

|  |  |  |
| --- | --- | --- |
| Address | Instruction | What it does |
| 00 |  |  |
| 01 |  |  |
| 02 |  |  |
| 03 |  |  |
| 04 |  |  |
| 05 |  |  |
| 06 |  |  |
| 07 |  |  |
| 08 |  |  |
| 09 |  |  |
| 10 |  |  |

#### 2 Addition & Subtraction

Write a program that correctly calculates   
x + y + z – a – b (Ex. 1 + 2 + 3 – 4 – 5 = -3)

Data:

|  |  |  |
| --- | --- | --- |
| Address | Value | Comment |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

Program:

|  |  |  |
| --- | --- | --- |
| Address | Instruction | What it does |
| 00 |  |  |
| 01 |  |  |
| 02 |  |  |
| 03 |  |  |
| 04 |  |  |
| 05 |  |  |
| 06 |  |  |
| 07 |  |  |
| 08 |  |  |
| 09 |  |  |
| 10 |  |  |