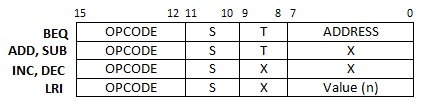
**CMPT 250: Assignment 2**

**Documentation File**

1. **\\freesia.csil.sfu.ca\userdata\chanroyc\Desktop\pf2.jpg**Proposed Physical Formats for Instruction Set
2. Assembly Language Program for Algorithm Given

LRI R[0], value

LRI R[1], value

LRI R[2], 0

Loop: BEQ R[0], R[2]  
 PC <-PC+x”3”

ADD R[2], R[1]

DEC R[0]

Quit: PC <-x”4”

DISPL R[2]

STOP

1. Number of External Memory Accesses for one iteration of the loop

|  |  |  |  |
| --- | --- | --- | --- |
| SYNTAX | SEMANTICS | FETCH | EXEC |
| LRI R[0], value | R[0] <- value | 1 | 0 |
| LRI R[1], value | R[1] <- value | 1 | 0 |
| LRI R[2], 0 | R[2] <- 0 | 1 | 0 |
| BEQ R[0], R[2] | If R[0] = 0, Branch | 1 | 0 |
|  |  |  |  |
| ADD R[2], R[1] | R[2] <- R[2] + R[1] | 1 | 0 |
| DEC R[0] | R[0] <- R[0] – 1 | 1 | 0 |
|  |  |  |  |
| DISPL R[2] | Output Value in R[2]; |  |  |
| STOP | Stop Execution | 1 | 0 |

1. Completed table for Machine Language Program

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ADDRESS | Contents | | | |
|  | -opc- | -s&t- | Addr/n(7:4) | Addr/n(3:0) |
| 00 | 6 | 0 | 0 | A |
| 01 | 6 | 4 | 0 | A |
| 02 | 6 | 8 | 0 | 0 |
| 03 | 5 | 0 | 0 | 7 |
| 04 | 1 | 9 | 0 | 0 |
| 05 | 4 | 0 | 0 | 0 |
| 06 | 5 | 0 | 0 | 3 |
| 07 | 7 | 8 | 0 | 0 |
| 08 | 0 | 0 | 0 | 0 |
| 09 |  |  |  |  |
| 0A | value |  |  |  |
| 0B |  |  |  |  |
| 0C |  |  |  |  |

1. CPE Table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| OPCODE | S0 | Lr | C0 | SEL |
| 0000 | 0 | 0 | 0 | 000 |
| 0001 | 1 | 1 | 0 | 011 |
| 0010 | 1 | 1 | 1 | 100 |
| 0011 | 1 | 1 | 1 | 001 |
| 0100 | 1 | 1 | 0 | 010 |
| 0101 | 0 | 0 | 0 | 101 |
| 0110 | 0 | 1 | 0 | 000 |
| 0111 | 0 | 0 | 0 | 000 |

1. Waveform Diagram