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Winter 2020 Assignment 3

**COMP 228 Assignment 3**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Byte Address** | | | **Memory content** | |
| **Decimal** | **Bin** | **Hex** | **In binary** | **In hex** |
| 0 | 00000000 | 00 | 000011 00010 00001 00000000000000100 | 06410004 |
| 4 | 00000100 | 04 | 000011 00100 00011 00000000000001000 | 09060008 |
| 8 | 00001000 | 08 | 010100 00110 00010 00100 00000 000000 | 50C22000 |
| 12 | 00001100 | 0C | 010110 01000 00100 00110 00000 000000 | 59043000 |
| 16 | 00010000 | 10 | 000100 00110 00011 00000000000001000 | 10C30008 |
| 20 | 00010100 | 14 | 000100 01000 00101 00000000000000100 | 11050004 |
| 24 | 00011000 | 18 | 011010 00011 10000 00011 00000 000000 | 68701800 |
| 28 | 00011100 | 1C | 011011 00101 00100 00101 00000 000000 | 6CA42800 |
| 32 | 00100000 | 20 | 100001 00011 00101 00000000000000100 | 84500004 |
|  |  |  |  |  |
| 100 | 01100100 | 64 | 011100 | 1C |
| 104 | 01101000 | 68 | 010001 | 11 |
| … |  |  |  |  |
| 128 | 10000000 | 80 | 011101 | 29 |
| 132 | 10000100 | 84 | 100000 | 20 |

**Pipeline:**

Instruction-1

f: Fetched l.d f2,4(r1) at address 00 (Hex) PC=04(Hex)

d: Set opc to 3.

d: Set D\_Out1 to 100.

d: Set D\_Out2 to 4.

d: Set dest to f2.

x: Set X\_Out to 104.

m: Set M\_Out to 17.

w: Set f2 to 17.

Instruction-2

f: Fetched l.d f4,8(r3) at address 04 (Hex) PC=08(Hex)

d: Set opc to 3.

d: Set D\_Out1 to 120.

d: Set D\_Out2 to 8.

d: Set dest to f4.

x: Set X\_Out to 128.

m: Set M\_Out to 41.

w: Set f4 to 41.

Instruction-3

f: Fetched mul.d f6,f2,f4 at address 08 (Hex) PC=0C(Hex)

d: Set opc to 20.

d: Set D\_Out1 to 17.

d: Set D\_Out2 to 41.

d: Set dest to f6.

x: Set X\_Out to 697.

m: N.

w: Set f6 to 697.

Instruction-4

f: Fetched add.d f8,f4,f6 at address 0C (Hex) PC=10(Hex)

d: Set opc to 22.

d: Set D\_Out1 to 41.

d: Set D\_Out2 to 697.

d: Set dest to f8.

x: Set X\_Out to 28577.

m: N.

w: Set f8 to 28577.

Instruction-5

f: Fetched s.d f6,8(r3) at address 10 (Hex) PC=14(Hex)

d: Set opc to 4.

d: Set D\_Out1 to 120.

d: Set D\_Out2 to 8.

d: N.

x: Set X\_Out to 128.

m: Set Address 80 (Hex) to 697.

w: N.

Instruction-6

f: Fetched s.d f8,4(r5) at address 14 (Hex) PC=18(Hex)

d: Set opc to 4.

d: Set D\_Out1 to 200.

d: Set D\_Out2 to 4.

d: N.

x: Set X\_Out to 204.

m: Set Address CC (Hex) to 28577.

w: N.

Instruction-7

f: Fetched addi r3,r3,16 at address 18 (Hex) PC=1C(Hex)

d: Set opc to 26.

d: Set D\_Out1 to 120.

d: Set D\_Out2 to 16.

d: Set dest to r3.

x: Set X\_Out to 136.

m: N.

w: Set r3 to 136.

Instruction-8

f: Fetched subi r5,r5,4 at address 1C (Hex) PC=20(Hex)

d: Set opc to 27.

d: Set D\_Out1 to 200.

d: Set D\_Out2 to 4.

d: Set dest to r5.

x: Set X\_Out to 196.

m: N.

w: Set r5 to 196.

Instruction-9

f: Fetched bne r3,r5,loop at address 20 (Hex) PC=00(Hex)

d: Set opc to 33.

d: Set D\_Out1 to 136.

d: Set D\_Out2 to 196.

d: N.

x: N.

m: N.

w: N.