|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Type | Function | ExSrc | ExS | RS2Src | WB | MemR | MemW | WBdata |
| R-type | And, add, sub | X | X | 0 | 1 | 0 | 0 | 0 |
| R- type | CMP | X | X | 0 | 0 | 0 | 0 | X |
| I-type | ADDI, ANDI | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| I-type | LW | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| I-type | SW | 1 | 1 | 1 | 0 | 0 | 1 | X |
| I-type | BEQ | 1 | 1 | 0 | 0 | 0 | 0 | X |
| J-type | × | 2 | 1 | X | 0 | 0 | 0 | X |
| S-type | SLL, SLR | 0 | 0 | X | 1 | 0 | 0 | 0 |
| S-type | SLLV, SLRV | X | X | 0 | 1 | 0 | 0 | 0 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Type | Function | Stop bit | Zero flag | PCSrc | PCaddSrc1 | PCaddSrc2 |
| R-type | X | 1 | X | 0 | X | X |
| R-type | X | 0 | X | 2 | X | X |
| I-type | All-BEQ | 1 | X | 0 | X | X |
| I-type | All-BEQ | 0 | X | 2 | X | X |
| I-type | BEQ | 1 | X | 0 | X | X |
| I-type | BEQ | 0 | 1 | 1 | 1 | 1 |
| J-type | J | 1 | X | 0 | X | X |
| J-type | J | 0 | X | 1 | 0 | 0 |
| J-type | JAL | X | X | 1 | 0 | 0 |
| S-type | X | 1 | X | 0 | X | X |
| S-type | X | 0 | X | 2 | X | X |

ALU :

|  |  |  |  |
| --- | --- | --- | --- |
| Type | Function | ALUsrc | ALUop |
| R-type | AND | 0 | AND |
| R-type | ADD | 0 | ADD |
| R-type | SUB | 0 | SUB |
| R-type | CMP | 0 | SUB |
| I-type | ADDI | 1 | ADD |
| I-type | SUBI | 1 | SUB |
| I-type | LW | 1 | ADD |
| I-type | SW | 1 | ADD |
| I-type | BEQ | 0 | SUB |
| J-type | J | X | X |
| J-type | JAL | X | X |
| S-type | SLL | 1 | SLL |
| S-type | SLR | 1 | SLR |
| S-type | SLLV | 0 | SLL |
| S-type | SLRV | 0 | SLR |

Stack :

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type | Function | Stop bit | StR | StW |
| R-type, I-type, S-type | X | 0 | 0 | 0 |
| R-type, I-type, S-type | X | 1 | 1 | 0 |
| J-type | J | 0 | 0 | 0 |
| J-type | J | 1 | 1 | 0 |
| J-type | JAL | X | 0 | 1 |

States:

IF 0

ID 1

EX 2

MEM 3

WB 4

Stack 5