## Control Signals

| Instruction | op[5,4,3,2,1,0] | fc[5,4,3,2,1,0] | RegDst | Branch | MemRd | MemWr | M2R | AluSrc | RegWr | Jump |
|---|---|---|---|---|---|---|---|---|---|---|
| add | 0 0 0 0 0 0 | 1 0 0 0 0 0 | 00 | 0 | 0 | 0 | 000 | 0 | 1 | 00 |
| sub | 0 0 0 0 0 0 | 1 0 0 0 1 0 | 00 | 0 | 0 | 0 | 000 | 0 | 1 | 00 |
| and | 0 0 0 0 0 0 | 1 0 0 1 0 0 | 00 | 0 | 0 | 0 | 000 | 0 | 1 | 00 |
| or | 0 0 0 0 0 0 | 1 0 0 1 0 1 | 00 | 0 | 0 | 0 | 000 | 0 | 1 | 00 |
| nor | 0 0 0 0 0 0 | 1 0 0 1 1 1 | 00 | 0 | 0 | 0 | 000 | 0 | 1 | 00 |
| xor | 0 0 0 0 0 0 | 1 0 0 1 1 0 | 00 | 0 | 0 | 0 | 000 | 0 | 1 | 00 |
| slt | 0 0 0 0 0 0 | 1 0 1 0 1 0 | 00 | 0 | 0 | 0 | 001 | 0 | 1 | 00 |
| addi | 0 0 1 0 0 0 | ---------- | 01 | 0 | 0 | 0 | 000 | 1 | 1 | 00 |
| andi | 0 0 1 1 0 0 | ---------- | 01 | 0 | 0 | 0 | 000 | 1 | 1 | 00 |
| ori | 0 0 1 1 0 1 | ---------- | 01 | 0 | 0 | 0 | 000 | 1 | 1 | 00 |
| xori | 0 0 1 1 1 0 | ---------- | 01 | 0 | 0 | 0 | 000 | 1 | 1 | 00 |
| sll | 0 0 0 0 0 0 | 0 0 0 0 0 0 | 00 | 0 | 0 | 0 | 000 | 0 | 1 | 00 |
| srl | 0 0 0 0 0 0 | 0 0 0 0 1 0 | 00 | 0 | 0 | 0 | 000 | 0 | 1 | 00 |
| beq | 0 0 0 1 0 0 | ---------- | xx | 1 | 0 | 0 | xxx | 0 | 0 | 00 |
| j | 0 0 0 0 1 0 | ---------- | xx | 0 | 0 | 0 | xxx | x | 0 | 01 |
| jr | 0 0 0 0 0 0 | 0 0 1 0 0 0 | xx | 0 | 0 | 0 | xxx | x | 0 | 10 |
| jal | 0 0 0 0 11 | ---------- | 10 | 0 | 0 | 0 | xxx | x | 0 | 01 |
| lw | 1 0 0 0 1 1 | ---------- | 01 | 0 | 1 | 0 | 001 | 1 | 1 | 00 |
| sw | 1 0 1 0 1 1 | ---------- | xx | 0 | 0 | 1 | xxx | 1 | 0 | 00 |
| mul | 0 0 0 0 0 0 | 0 1 1 0 0 0 | xx | 0 | 0 | 0 | xxx | 0 | 0 | 00 |
| div | 0 0 0 0 0 0 | 0 1 1 0 1 0 | xx | 0 | 0 | 0 | xxx | 0 | 0 | 00 |
| mfo | 0 0 0 0 0 0 | 0 1 0 0 1 0 | 00 | 0 | 0 | 0 | 011 | 0 | 1 | 00 |
| mfhi | 0 0 0 0 0 0 | 0 1 0 0 0 0 | 00 | 0 | 0 | 0 | 100 | 0 | 1 | 00 |
| lui | 0 0 1 1 1 1 | ---------- | 01 | 0 | 0 | 0 | 101 | x | 1 | 00 |

## Registers

| | |
|---|---|
| $zero | 0 |
| $at | 1 |
| $v0-$v1 | 2-3 |
| $a0-$a3 | 4-7 |
| $t0-$t7 | 8-15 |
| $S0-$S7 | 16-23 |
| $t8-$t9 | 24-25 |
| $k0-$k1 | 26-27 |
| $gp | 28 |
| $sp | 29 |
| $fp | 30 |
| $ra | 31 |

## Instruction Format