|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Instruction | Reg2Loc | ALUSrc | MemtoReg | RegWrite | MemRead | MemWrite | Branch | UncondBranch | ALUOp | SignOp | ImmToReg |
| AND | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0000 | xxx | 0 |
| ORR | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0001 | xxx | 0 |
| ADD | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0010 | xxx | 0 |
| SUB | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0110 | xxx | 0 |
| ADDI | x | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0010 | 000 | 0 |
| SUBI | x | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0110 | 000 | 0 |
| LDUR | x | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0010 | 001 | 0 |
| STUR | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0010 | 001 | 0 |
| CBZ | 1 | 0 | x | 0 | 0 | 0 | 1 | 0 | 0111 | 011 | 0 |
| B | x | x | x | 0 | 0 | 0 | x | 1 | xxxx | 010 | 0 |
| MOVZ | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0111 | 100 | 1 |

To add the MOVZ function: add a mux to choose from the output of the Sign-Extension module and output of the MemToReg mux. This also needs a control signal to choose the path to send our immediate value with 0’s to write register, we will name the control signal “ImmToReg”. All other instructions will have this mux set to 0, as only MOVZ will use this.