|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **fcn** | **OPcode** | **ALUsrc** | **ALUop** | **Mem**  **Read** | **Mem**  **Write** | **Reg**  **Write** | **Mem**  **To Reg** | **Reg Dst** | **Branch** | **Jump** |
| *AND* | *0000* | *0* | *1* | *0* | *0* | *1* | *0* | *1* | *0* | *0* |
| *OR* | *0001* | *0* | *1* | *0* | *0* | *1* | *0* | *1* | *0* | *0* |
| *XOR* | *0010* | *0* | *1* | *0* | *0* | *1* | *0* | *1* | *0* | *0* |
| *NOR* | *0011* | *0* | *1* | *0* | *0* | *1* | *0* | *1* | *0* | *0* |
| *Add* | *0100* | *0* | *1* | *0* | *0* | *1* | *0* | *1* | *0* | *0* |
| *Sub* | *0101* | *0* | *1* | *0* | *0* | *1* | *0* | *1* | *0* | *0* |
| *less* | *0110* | *0* | *1* | *0* | *0* | *1* | *0* | *1* | *0* | *0* |
| *Beq* | *0111* | *0* | *1* | *0* | *0* | *0* | *0* | *0* | *1* | *0* |
| *Addi* | *1100* | *1* | *0* | *0* | *0* | *1* | *0* | *1* | *0* | *0* |
| *Subi* | *1101* | *1* | *0* | *0* | *0* | *1* | *0* | *1* | *0* | *0* |
| *lw* | *1000* | *1* | *0* | *1* | *0* | *1* | *1* | *0* | *0* | *0* |
| *sw* | *1001* | *1* | *0* | *0* | *1* | *0* | *X* | *X* | *0* | *0* |
| *jump* | *1111* | *x* | *x* | *x* | *0* | *0* | *0* | *X* | *0* | *1* |

# COMPUTATIONAL ANALYSIS OF CONTROL UNIT

# ALU control Table

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Input Opcode** | | | | | | **Output Opcode** | | | |
|  | *ALUop* | *I1* | *I2* | *I3* | *I4* | *O1* | *O2* | *O3* | *Enable* |
|  | *0* | *x* | *x* | *x* | *x* | *x* | *x* | *x* | *0* |
| *AND* | *1* | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *1* |
| *OR* | *1* | *0* | *0* | *0* | *1* | *0* | *0* | *1* | *1* |
| *XOR* | *1* | *0* | *0* | *1* | *0* | *0* | *1* | *0* | *1* |
| *NOR* | *1* | *0* | *0* | *1* | *1* | *0* | *1* | *1* | *1* |
| *Add* | *1* | *0* | *1* | *0* | *0* | *1* | *0* | *0* | *1* |
| *Sub* | *1* | *0* | *1* | *0* | *1* | *1* | *0* | *1* | *1* |
| *Beq* | *1* | *0* | *1* | *1* | *1* | *1* | *1* | *1* | *1* |
| *Less* | *1* | *0* | *1* | *1* | *0* | *1* | *1* | *0* | *1* |
| *Addi* | *1* | *1* | *1* | *0* | *0* | *1* | *0* | *0* | *1* |
| *Subi* | *1* | *1* | *1* | *0* | *1* | *1* | *0* | *1* | *1* |
| *Lw* | *1* | *1* | *0* | *0* | *0* | *1* | *0* | *0* | *1* |
| *Sw* | *1* | *1* | *0* | *0* | *1* | *1* | *0* | *0* | *1* |
| *Jump* | *x* | *1* | *1* | *1* | *1* | *x* | *X* | *x* | *x* |