Q5. Implement jal

To implement jal, we need to perform PC+4 -> R[31] and PC <- jump address.

We need to write $31 into the mux associated with RegDst. $31 is later loaded into ‘Write register’ of the register file.

We also need to get the (PC+4) signal from PC into the mux associated with MemtoReg. This value is later loaded into ‘Write data’ of the register file.

Because those multiplexers initially had two inputs, the control signals were only 1 bit.

Therefore, we need to extend the mux signals to 2 bits wide.

When executing the jal instruction, the following signals are used:

|  |  |
| --- | --- |
| MemRead = 0  MemWrite = 0  MemtoReg = 10 (PC+4)  IRWrite = 0 | RegWrite = 1  RegDist = 10 (#31) |