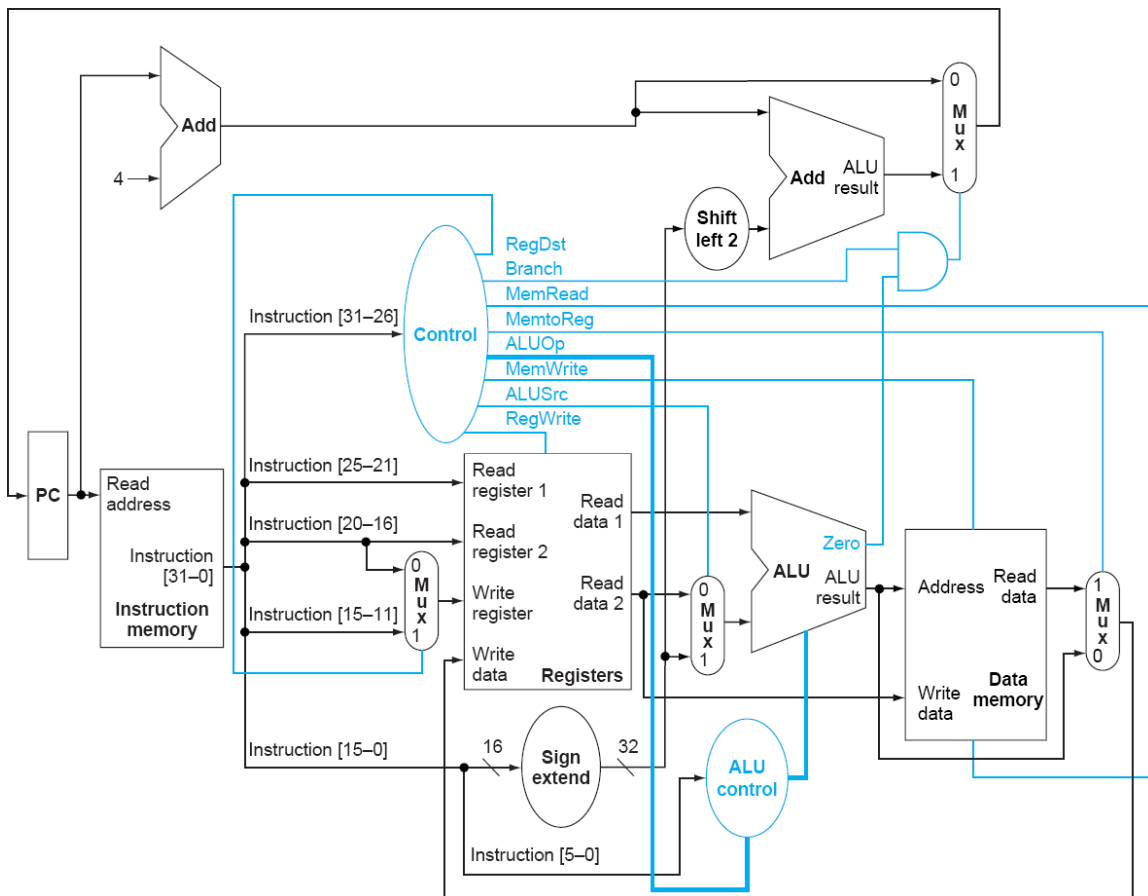


Name (please print): _____ Total points: ___/30

Instructions

This is a CLOSED BOOK and CLOSED NOTES quiz. However, you may use calculators, scratch paper, and the green MIPS reference card from your textbook. Ask the instructor if you have any questions. Good luck!

- (10 points) Provide all control signals for the ADDI instruction using the following processor design. Assume ALUOp is 10 for interpretation of instruction function code, 00 for add, and 01 for subtract.



RegDst	_____	MemWrite	_____
Branch	_____	ALUSrc	_____
MemRead	_____	RegWrite	_____
MemtoReg	_____		
ALUOp	_____		

2. (10 points) Describe how the above design would need to be modified in order to add the **BEQAL** *rs, rt, label* (branch if equal and link) instruction, which performs the following register transactions:

```
if R[rs] == R[rt] {  
    R [31] <= PC+4  
    PC <= PC+4+BranchAddr  
}
```

3. (10 points) Briefly describe the disadvantages of the single-cycle processor design.