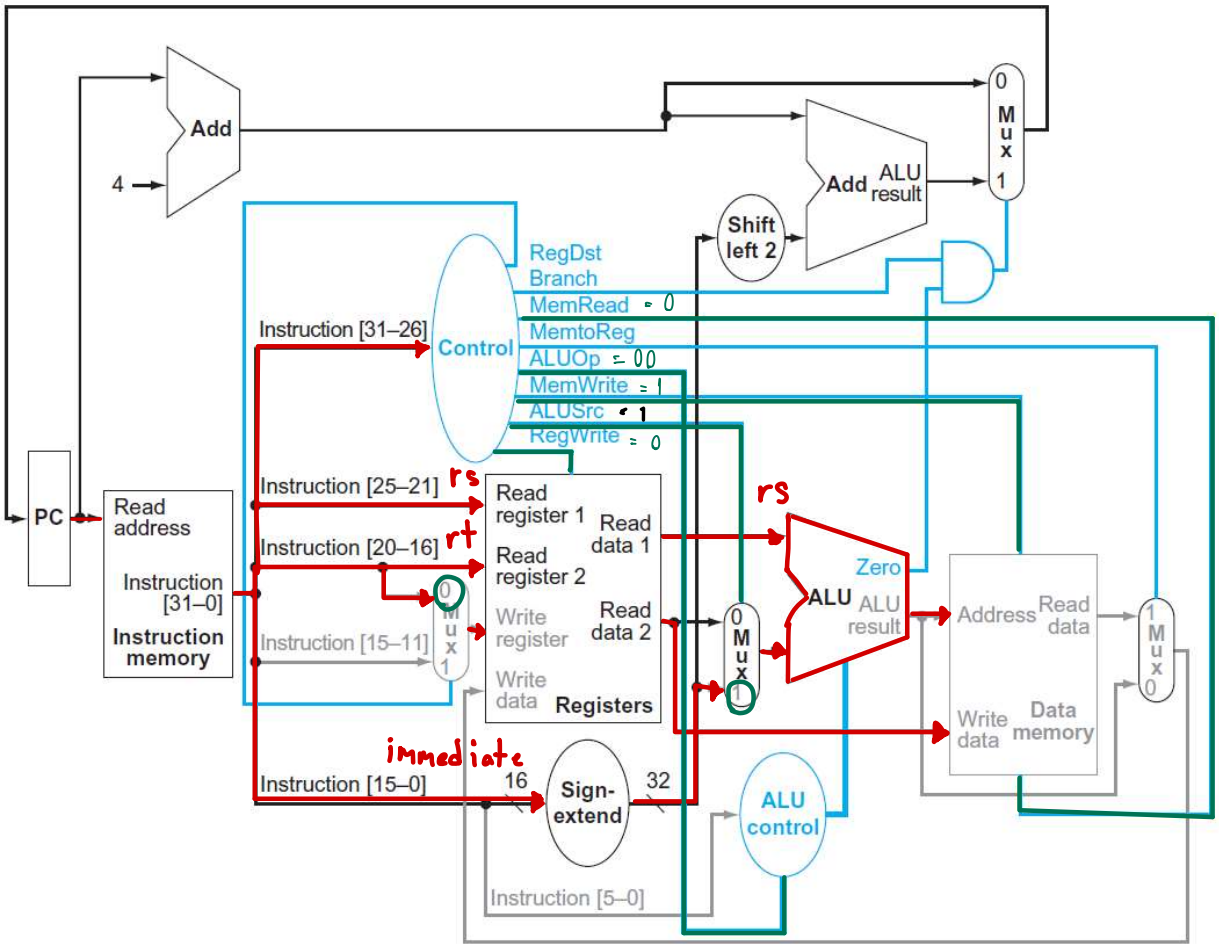
ศิวกฤ โกสัยอัมพร 6507050 6026

CPE 223 Computer Architectures HW#3 Datapath Due: 20 Feb 2024 before 23.59

1. Use the datapath architecture below to describe how the control lines are set in the execution of the instruction

rt offset rs
sw $t0, 32($a0) opcode : $2b_{hex}$

Assume $a0 contains 0x00003210. Show the opcode, rs, rt, and offset.



Steps : 1. Fetch instruction and increase PC count by 4.
2. Read offset as register 1 and address as immediate
3. Operates offset and address at ALU to get address
4. Put rt to write data in Data memory and address in data memory.
5. Write register with rt.

Control lines : MemRead = 0 , MemWrite = 1 , RegWrite = 0
ALUOp = 00 , ALUSrc = 1

2. Use the datapath architecture below to describe how the control lines are set in the execution of the instruction

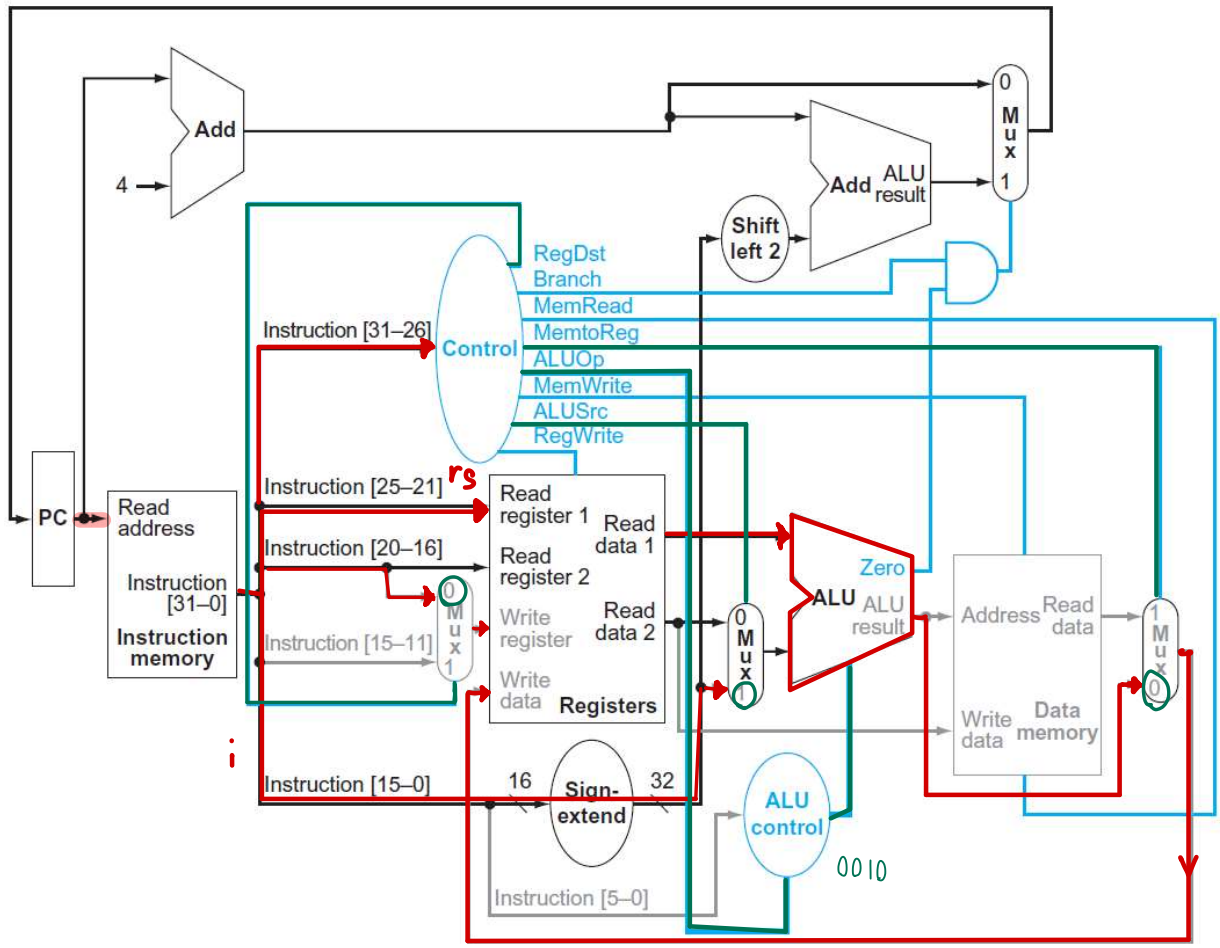
rd rs rt

addi $s3, $s2, 0x4567 opcode : 8_{hex}

↳ 17,767

Assume $s2 contains 0x00001234. Show the opcode, funct, rs, and rt.

↳ 4660



Steps : 1. Fetch instruction and increase PC count by 4.

2. Read register 1 in register file

3. Read data 1 and immediate operates in ALU and perform add operation

4. Write data back to rt (register 2)

Control lines : ALUOp = 10 , Reg Write = 1

ALUSrc = 1 , Regdst = 0

MemtoReg = 1