

Cs252 Homework 5

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1 1.d

1.1 sll forwards to the MEM register

1.2 sub forwards to the WB register

1.3 sll forwards to the WB register

1.4 sub forwrds to the MEM register

2 2.f

2.1 No Forwarding

This sequence has two dependencies, instruction 3 and 4. So there is a stall on instruction 2. Thus instruction 2 is in the WB phase. So on the 7th clock cycle instruction 3 is in the EX phase. The 4th instruction must be stalled in the ID phase.

2.2 With Forwarding

With forwarding there is no stalls as there is no lw instruction. So all of the instruction execute without stalls. By clock cycle 7 instruction 3 is in the WB phase and instruction 4 is in MEM.