

First Name: _____ Last Name: _____

- 1) Two actions must be completed before a beq's branch can be taken, actions that take time. Obviously, one is to determine whether the beq's two source registers' values are equal. The other is to compute _____.
- the beq's target address
 - the beq instruction's source registers' addresses
 - the beq instruction's address
- 2) The action of computing the beq's target address can be done earlier, in the ID stage rather than the EX stage. That action means the target address will be computed for all instructions, not just beq instructions. A problem that may occur with such computing for all instructions is _____.
- branching to a wrong target address
 - longer flushing.
 - (no problem exists)
- 3) For beq, determining if the two source registers' values are equal is done in an earlier stage than EX using _____.
- XOR gates
 - the existing ALU
 - a second ALU

4) Assume the following sequence of instructions

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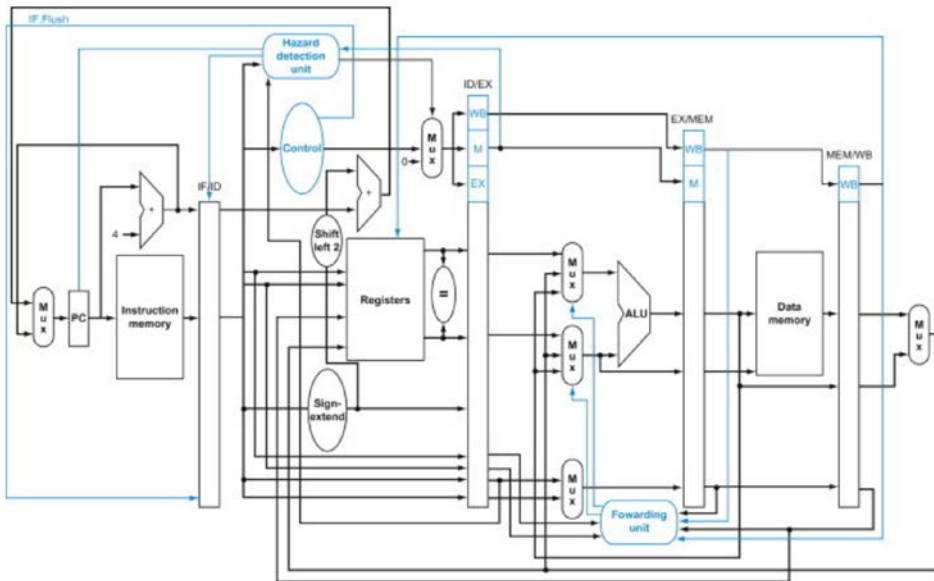
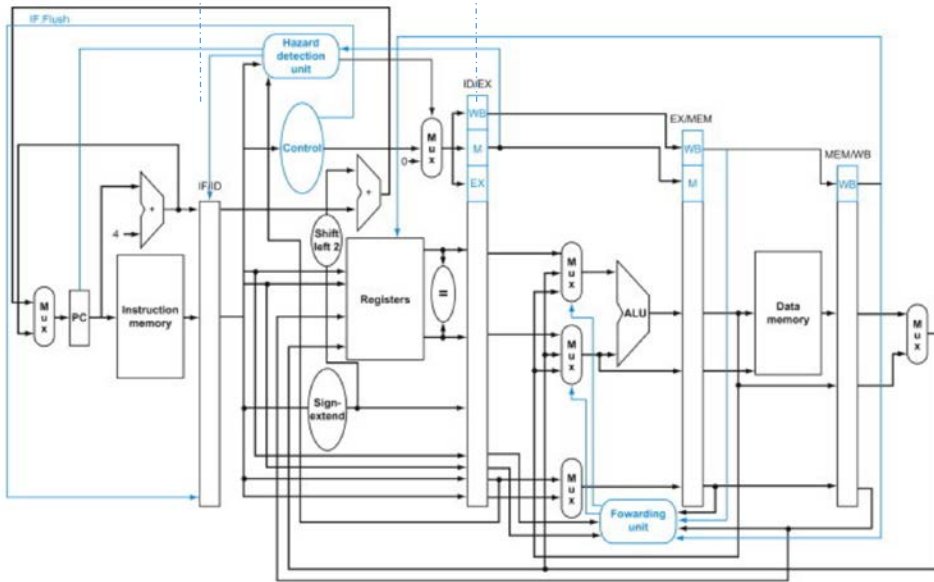
32  sub  $10, $4, $8
36  sw   $2, 2($8)
40  beq  $2, $4, 3
44  and  $12, $2, $5
48  or   $13, $2, $6
52  add  $14, $4, $2
56  slt  $15, $6, $7

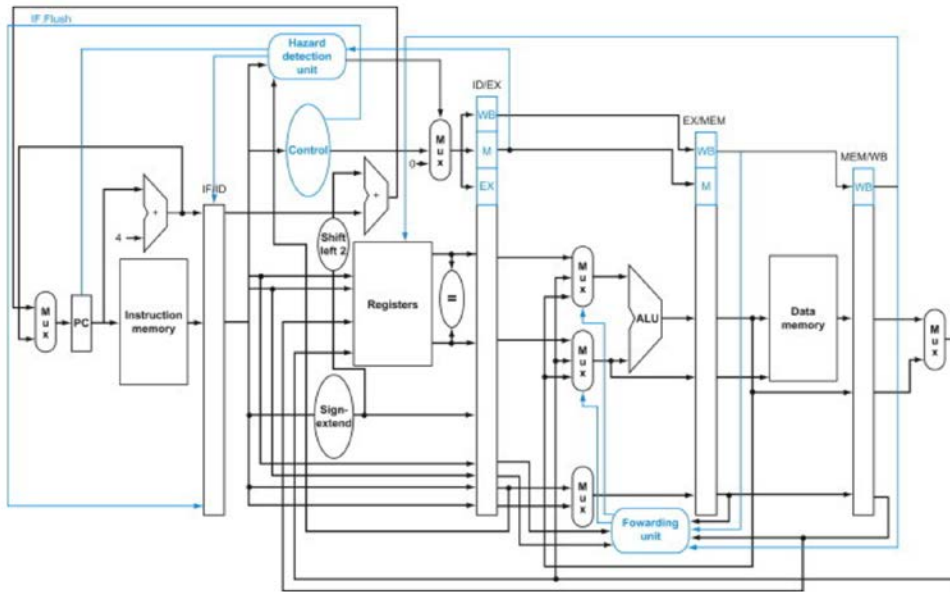
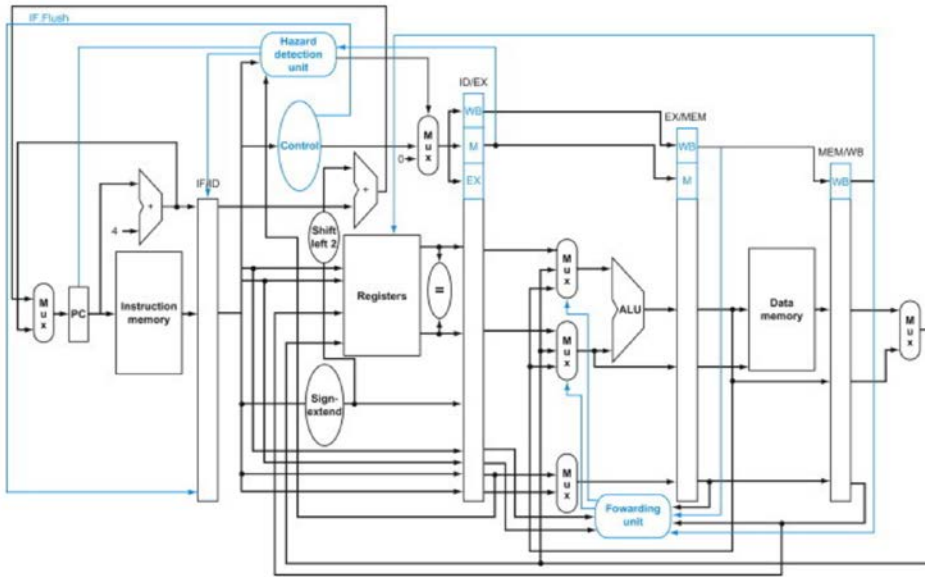
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- a. Using the following diagram, assuming (\$2)= 0x37 (\$4)= 0x37, show the next three cycling steps:
- b. Repeat a for (\$2)= 0x37 (\$4)= 0x7

a.

and \$12,\$2,\$5 beq \$2,\$4,3 sw \$2, 2(\$8)





b.

and \$12,\$2,\$5 beq \$2,\$4,3 sw \$2, 2(\$8)

