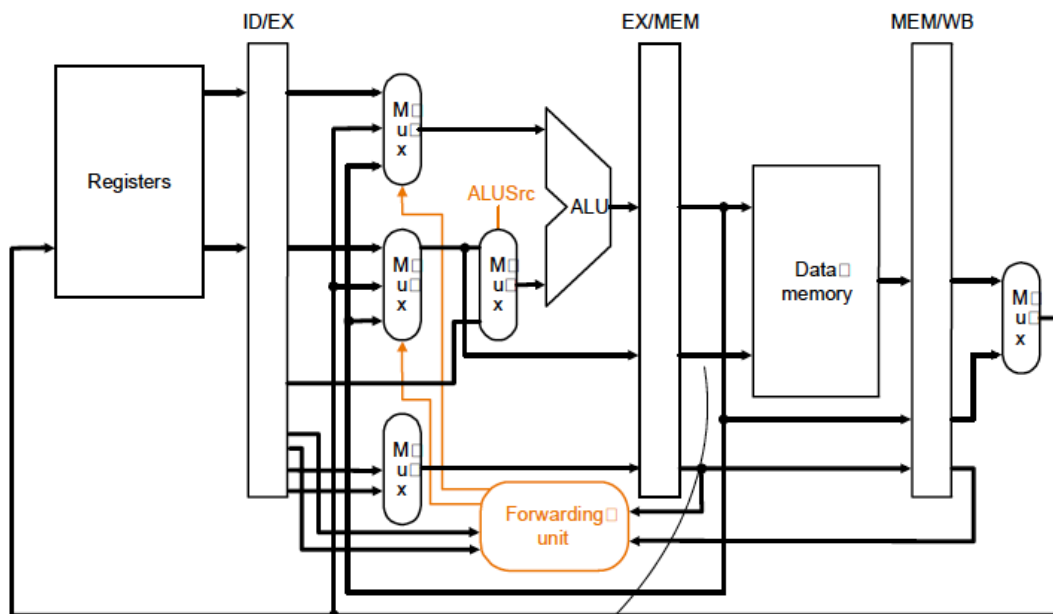1. Consider the following code sequence used often in block copies. This produces a special form of the load hazard and normally introduces one stall cycle.

lw $7, 0($12)

sw $7, 0($13)

Show how you can use forwarding to avoid the occurrence of stalls in this situation. Provide your solution by modifying the view of the datapath provided below and precisely state the conditions you would check to implement such forwarding.

Add a multiplexor to the data input to memory. The inputs are as shown at left. Now the output of memory from the previous instruction can be fed to the input to memory for the current instruction.

memory data input

from read data output
of memory