CO262. Tutorial 1. 11 – Jan – 2018

1. Consider the 5-stage MIPS pipeline with forwarding enabled.
a. Write the pipeline timing diagram for the 3rd iteration of the following loop. Show all instructions that are in the pipeline during these cycles (not just those from the 3rd iteration). Assume that, when required, the pipeline stalls in the ID stage to read the latest value of an input operand. b. What is the CPI of the instructions sequence from this iteration?

```
Loop: LD R1, 0(R2)
ADDI R1, R1, 1
SW R1, 0(R2)
ADDI R2, R2, 4
SUB R3, R3, 1
BNEZ R3, LOOP
```

2. Write the conditions to be checked in the Forwarding Unit to ensure that the following code works correctly.

```
add $1,$1,$2
add $1,$1,$3
add $1,$1,$4
...
```

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Rough Work