

Homework

Problems in this exercise refer to the following sequence of instructions, and assume that it is executed on a five-stage pipelined datapath:

```
add  x15, x12, x11
ld    x13, 4(x15)
ld    x12, 0(x2)
or    x13, x15, x13
sd    x13, 0(x15)
```

- 1) If there is no forwarding or hazard detection, insert NOPs to ensure correct execution.
- 2) If the processor has forwarding, but we forgot to implement the hazard detection unit, what happens when the code executes?
- 3) If there is forwarding, for the first seven cycles during the execution of this code, specify which signals are asserted in each cycle and show a pipeline execution diagram.