CS3375: Computer Architecture
Spring 2020

Homework #5

- Name only: __chen zhang_____
- Release date: Apr 8th, 2020 (Wednesday)
- Due date: **Apr 15th, 2020 (Wednesday) before the class begins (1:00 PM)**
- It should be done INDIVIDUALLY; Show ALL your work
- Write your FULL name only
- Total: 10 pts

1. Refer to the following sequence of instructions:

```
or  r1,  r2,  r3
or  r2,  r1,  r4
or  r1,  r1,  r2
```

    a. Assume there is no forwarding in this pipelined processor. Indicate hazards and add `nop` instruction to eliminate them.

<div align="right">[3 pts]</div>

    b. Assume there is full forwarding. Indicate hazards and add `nop` instructions to eliminate them, if necessary.

<div align="right">[2 pts]</div>

2. Refer to the following sequence of instructions, and assume that it is executed on a 5-stage pipelined datapath.

```
add  r5, r2, r1
lw   r3, 4(r5)
lw   r2, 0(r2)
or   r3, r5, r3
sw   r3, 0(r5)
```

    a. If there is no forwarding or hazard detection, insert `nop`s to ensure correct execution.

<div align="right">[3 pts]</div>

    b. If the processor has forwarding, but we forgot to implement the hazard detection unit, what happens when this code executes?

<div align="right">[2 pts]</div>