Q1 FP
2 Points

Two bitstrings 0x7f6cbcef and 0xff70e2ab represent 32 bit floating point numbers. Will overflow occur when you add them ?

- ○ Yes, because the result is too large
- ◉ No, because the the two numbers have different signs
- ○ No, because they have same sign but exponent field fits the result

Q2
5 Points

Lets imagine we construct RISC5 with one unified instruction and data memory (instead of two separate ones). Assume all forwarding logic exists in the pipeline.

Q2.1
1 Point

Will this pipeline always have a stall ?

- ◉ No, it will only have extra stalls for certain instruction sequences
- ○ Yes, since now MEM and IF stages have a structural hazard
- ○ No, it will have no more stalls than our regular pipeline

Q2.2
2 Points

How many cycles will the following program (do not reorder instructions) stall in the regular pipeline (i.e., with separate instruction and data memories):

```
ADD X1, X2, X3
LW  X1, 100(X2)
SUB X2, X1, X3
ADD X2, X3, X4
SW X2, 10(X4)
```

1

Q2.3
2 Points

How many cycles will the same program stall on the new pipeline ?

3

Q3
3 Points

Say that a single branch is being taken 5 times in a row and then is not taken 2 times in a row and repeats this pattern forever (T,T,T,T,T,N,N,T,T,T,T,T,N,N, etc.)

Q3.1
2 Points

What will be the steady-state prediction rate for this branch on a 1 bit dynamic branch predictor ?

Just write the rate as a fraction to decimal places (e.g., 0.51) in box below.

0.714285

Q3.2
1 Point

If we were to use static branch prediction. Which of the following strategies will fare best?

- ○ Predict taken and not taken alternately
- ○ Always predict not taken
- ◉ Always predict taken

Quiz 3

● GRADED

STUDENT
LIANG, NEVIN

TOTAL POINTS
8 / 10 pts

QUESTION 1
FP — **2** / 2 pts

QUESTION 2
(no title) — **3** / 5 pts

2.1 (no title) — **1** / 1 pt

2.2 (no title) — **2** / 2 pts

2.3 (no title) — **0** / 2 pts

QUESTION 3
(no title) — **3** / 3 pts

3.1 (no title) — **2** / 2 pts

3.2 (no title) — **1** / 1 pt