CompArch HW3: Computer Arithmetic

Due: Tuesday, October 3

Instructions

This homework is to be completed individually. Please do not use online calculators. If you get stuck, you may ask for assistance. If you do, please annotate collaborators per problem.

Please show all your ~~wrok~~ work and $\boxed{\text{box your final answer.}}$

1. Convert each operand to binary.

2. Perform arithmetic in binary

3. Convert result to decimal

Be sure to indicate the format of each converted operand (and the result and intermediate values, if they have a different format):

- Number of bits

- Signed or unsigned

- Integer, fixed point, or floating point

Problems

Complete at least six of the following, including at least three from 1-4 and three from 5-8.

1. $91_{10} + C6_{16}$

2. $11_8 - 11_{10}$

3. $12.3125_{10} + 0110_{I2Q2}$

4. $5.75_{10} - 7.125_{10}$

5. $9_{10} \cdot 3_{10}$

6. $(-5)_{10} \cdot (-6)_{16}$

7. $9.5_{10} \cdot 2.625_{10}$

8. $(-1.25)_{10} \cdot 3.5_{10}$

Don't forget to sign-extend or zero-extend partial products as necessary

Optional/challenge

You **do not** need to complete the following problems.

1. Represent -5.6875_{10} in single-precision floating point format.

2. Interpret 0x44fc2000 as a single-precision floating point value, convert to decimal.