

CS 429 Homework 2

Name: _____ Section #: _____

Instructions: Type the answers into a file and submit on Canvas. As usual, you may collaborate with your class mates and ask for assistance from the TA. But don't copy anyone else's answer. Each problem is worth the same number of points (more or less).

1. Convert between binary and decimal representations:

(a) 11.475 to binary _____

(b) Binary 110000011001111 to hexadecimal _____

(c) Binary 101.1111 to decimal _____

2. Show the result of rounding to the nearest $1/8$ according to the round-to-even rule:

(a) 11.0001 _____

(b) 11.0010 _____

3. We have a 9bit FP representation based on the IEEE 754 standard: 1 for the sign, 4 for the exponent and 4 for the fraction. You may need to round. You should show your work for partial credit. Please show answers in binary.

(a) Represent 0.125 ($1/8$) in this system. _____

(b) Represent 5.25 in this system. _____

(c) Obtain the product of the two numbers from (a) and (b) above:

- Add the two exponents using exponent encoding: _____

- Multiply the two significands including rounding: _____

- Give the result in 9-bit binary format. _____

(d) Obtain the sum:

- Normalize so both have same exponent: _____

- Now show the sum, which may require normalizing exp or rounding. _____

4. (3 points) What **decimal** value is represented by the following bit string when interpreted as a single precision floating point value: 0x43008000?

5. (2 points) Represent decimal -63.0 as a single precision floating point value (in hex).