

Assignment 1 Part 3 (posted 02/08/2024, DUE as assigned on Canvas)

Score (by grader):

(Don't have to type but must be legible - no credits for any parts difficult to read/understand.)

- 8 (7 points) First represent unsigned decimal real number 76.78125 in binary, then re-write the binary result more compactly in hex.

Fill in the blanks: 76.78125 (dec) = 1001100.11001 (bin) = 4C.C8 (hex)

CAUTION: Be sure to clearly show working to not risk incurring penalty.

| | | |
|-----------|---|--------------------------|
| 76 | 0.78125 | 100 1100 1100 1000 |
| 76/2 = R0 | 0.78125 | ↓ ↓ ↓ ↓ |
| 38/2 = R0 | 2 | 4 C C 8 |
| 19/2 = R1 | 1.5625 | |
| 9/2 = R1 | 2 | ↓ |
| 4/2 = R0 | 1.125 | 4C.C8 |
| 2/2 = R0 | 2 | |
| 1/2 = R1 | .625 | |
| | 2 | |
| | .5 | |
| | 2 | |
| | .25 | |
| | 2 | |
| | .125 | |
| | 2 | |
| | .0625 | |
| | 2 | |
| | .03125 | |
| | 2 | |
| | .015625 | |
| | 2 | |
| | .0078125 | |
| | 2 | |
| | .00390625 | |
| | 2 | |
| | .001953125 | |
| | 2 | |
| | .0009765625 | |
| | 2 | |
| | .00048828125 | |
| | 2 | |
| | .000244140625 | |
| | 2 | |
| | .0001220703125 | |
| | 2 | |
| | .00006103515625 | |
| | 2 | |
| | .000030517578125 | |
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| | .0000152587890625 | |
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| | 2 | |

10 (8 points) Determine the decimal value that gives 418cc000 in hex when represented in IEEE 754-1985 single precision.

CALTION: Be sure to clearly show working to not risk incurring penalty.

$$\begin{array}{l}
 418cc000 : 0100\ 0001\ 1000\ 1100\ 1100\ 0000\ 0000\ 0000 \\
 \downarrow \qquad \qquad \downarrow \qquad \qquad \qquad \downarrow \\
 * \quad 126 + 1 \qquad \qquad \qquad 0.000110011 \cdot 2^4 \\
 \downarrow \qquad \qquad \qquad \downarrow \\
 \text{expo} = 131 - 127 \qquad \qquad \qquad 1.10011 \\
 = 4 \qquad \qquad \qquad \downarrow \\
 \qquad \qquad \qquad (1)2^0 + (1)2^{-1} + (0)2^{-2} + (0)2^{-3} + (1)2^{-4} + (1)2^{-5} \\
 \downarrow \\
 \underline{1.59375}
 \end{array}$$

(More writing space where needed - if used, be sure to clearly indicate which part is for which question.)