

Arlene Sagoinit
CSC 17A

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Due 12/17/21

problem 6 (Conversions)

a) 15.875_{10}

→ base 16

$$15 \times 16^0 = 15$$

$$0.875 \times 16 = 14$$

$$15.875_{10} = 15.14_{16} = \underline{F.E}_{16}$$

→ base 2

$$\begin{array}{ccc} F & . & E_{16} \\ \downarrow & & \downarrow \\ 1111 & . & 1110_2 \\ \hline 1 & 7 & . & 78 \end{array}$$

$$b) 0.7_{10}$$

→ base 16

$$0.7 \times 16 = 11.\underline{2}$$

$$0.2 \times 16 = 3.\underline{2}$$

$$0.2 \times 16 = 3.\underline{2}$$

$$= 0.B \underline{3}_{16}$$

→ base 2

$$0.1011 \underline{0011}_2$$

→ base 8

0.	101	100	110	011	001	100	110	011	001
	└─┘	└─┘	└─┘	└─┘	└─┘	└─┘	└─┘	└─┘	└─┘
0.	5	4	6	3	1	4	6	3	1

$$= 0.54631\underline{8}$$

c) 77.79_{10} \rightarrow base 16

$$\underline{4} \times 16^1 + \underline{13} \times 16^0 = 4D$$

$$0.79 \times 16 = 12.\underline{64} \quad C$$

$$0.64 \times 16 = 10.\underline{24} \quad A$$

$$0.24 \times 16 = 3.\underline{84} \quad 3$$

$$0.84 \times 16 = 13.\underline{44} \quad D$$

$$0.44 \times 16 = 7.\underline{04} \quad 7$$

$$0.04 \times 16 = 0.\underline{64} \quad 0$$

$$0.64 \times 16 = 10.\underline{24} \quad A$$

$$77.79_{10} = \underline{4D.CA3D70}_{16}$$

 \rightarrow base 2

$$\underline{0100 \ 1101 \ . \ 1100 \ 1010 \ 0011 \ 1101 \ \dots}_2$$

 \rightarrow base 8

$$\underline{1 \ 1 \ 5 \ . \ 6 \ 2 \ 4 \ 3 \ 6 \ \dots}_8$$

NASA Format

2.a) 1111.1110_2

0.11111110×2^4

0.11111111 00000000 00000000 0000 0100

7 F 0 0 0 0 0 4

2.b) $0.10110011_2 \times 2^0$

0.10110011 10011001 10011010 00000000

5 9 9 9 9 A 0 0

2.c) $\underline{1001101.1100101000111010000}_2$

$0.10011011100101000111101 \dots \times 2^7$

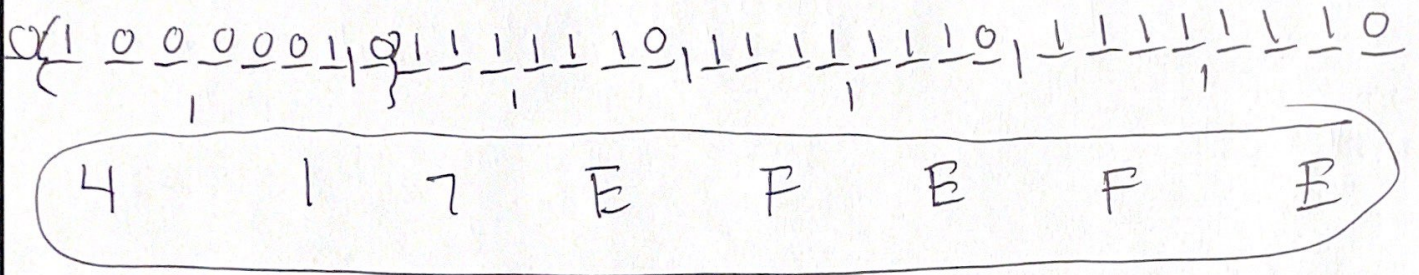
0.10011011 11001010 00111101 00000111

4 D C A 3 D 0 7

IEEE 754 format

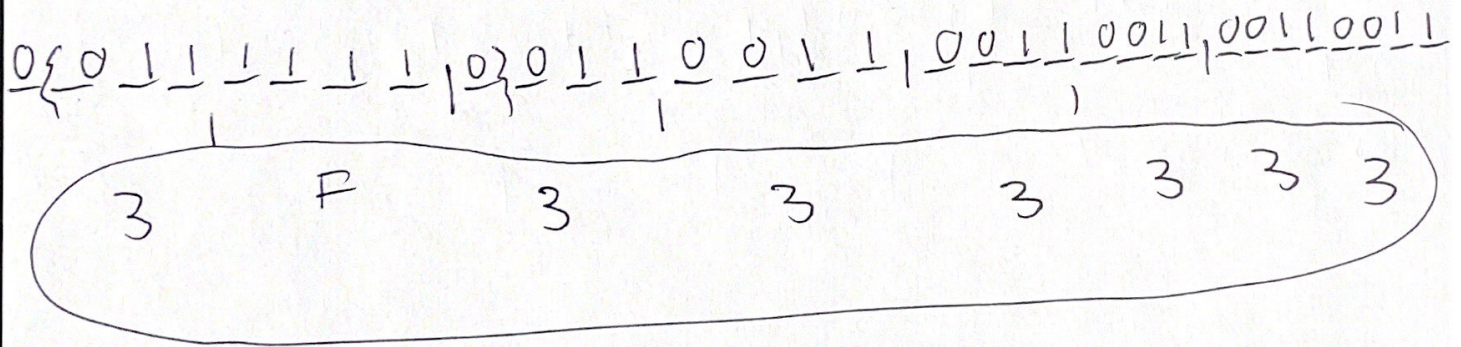
S)a $1111,1110_2$

$$1.1111110 \times 2^3 \quad \begin{array}{r} 127 \\ + 3 \\ \hline 130 \end{array}$$



S)b) 0.10110011_2

$$1.01100110011 \dots \times 2^{-1} \quad \begin{array}{r} 127 \\ - 1 \\ \hline 126 \end{array}$$



S.c) $1.00110111001010011101 \dots \times 2^0$

$$1.00110111001010011101 \dots \times 2^0 \quad \begin{array}{r} 127 \\ + 6 \\ \hline 133 \end{array}$$

