Complete the following review questions in Chapter 3 of *Computer Hardware, Systems Software, & Networking*:

3.2 How many different digits would you expect to find in base 6? What is the largest digit in base 6? Let z represent that largest digit. What is the next value after 21z if you're counting up by 1's? What is the next value after 4zz if you're counting up by 1's?

- Different digits would be 6 (0, 1, 2, 3, 4, and 5)
- The largest digit in base is 5
- When z = 5, the next value after 215 will be 220
- The next value after 455 will be 460

3.7 Using the weights in base 8, convert 212_{10} into base 8. Convert 3212_{10} into base 8.

- Converting 212_{10} into base 8:

{212 (1/8) = 26 [r =4], 26 (1/8) = 3[r =2], 3 (1/8) = 0[r =3]}

So the answer will be 324_8

- Converting 3212_{10} into base 8:

{3212(1/8) = 401 [r =4], 401 (1/8) = 50 [r =1], 50(1/8) = 6 [r =2], 6 (1/8) = 0 [r =6]}

So the answer will be 6214_8

3.8 Using the weights in base 16, convert 117_{10} into base 16. Convert 1170_{10} into base 16.

- Converting 1170_{10} into base 16:

{1170(1/16) = 73[r =2], 73(1/16) = 4[r =9], 4 (1/16) = 0 [r =4]}

So the answer will be 492_{16}

- Converting 117_{10} into base 16:

{117(1/16) = 7[r =5], 5(1/16) = 0[r =5]}

So the answer will be 75_{16}

3.9 Use the division conversion method to convert 3212_{10} into base 8. Confirm that your answer is the same as that in question 7, above.

- Converting 3212_{10} into base 8:

{3212(/8) = 401 [r =4], 401 (/8) = 50 [r =1], 50(/8) = 6 [r =2], 6 (/8) = 0 [r =6]}

So the answer will be 6214_8

3.10 Use the division method to convert 1170_{10} to base 16. Confirm that your answer is the same as that in question 8, above.

- Converting 117_{10} into base 16:

{117(/16) = 7[r =5], 5(/16) = 0[r =5]} So the answer will be 75_{16}

3.25 Convert the following numbers from decimal to hexadecimal. If the answer is irrational, stop at four hexadecimal digits:

a. 0.6640625

b. 0.3333

c. 69/256 = 0.26953125

a) {[0.6640625(16) =10 + 0.625], [0.625(16) = 10]} so: 0.6640625 = 0.AA

b) {[0.3333 (16) =5 + 0.3328], [0.3328(16) = 5+0.3248], [0.3248(16) = 5+0.1968], [0.1968(16) = 3+0.1488] ...} so: 0.3333 = 0.5553...

c) {[0.26953125 (16) = 4 + 0.3125], [0.3125(16) = 5]} so: 0.26953125= 0.45

3.27 Convert the following numbers from decimal to binary and then to hexadecimal:

a. 27.625

b. 4192.37761

Separating the numbers into 2 parts, converting them and then liking them again

a) {27(/2) = 13[r =1], 13 (/2) = 6[r =1], 6(/2) = 3 [r =0], 3 (/2) = 1 [r =1], 1(/2) = 0 [r =1]} and {[0.625(2) =1 + 0.25], [0.25(2) = 0+ 0.5], [0.5(2) = 1]} so: 27.625 = 11011.101_2 that is covered to hexadecimal 1B.A

b) {4192(/2) = 2096[r =0], 2096 (/2) = 1048[r =0], 1048(/2) = 524 [r =0], 524 (/2) = 262 [r =0], 262(/2) = 131 [r =0] 131(/2) = 65[r =1], 65(/2) = 32 [r =1], 32 (/2) = 16 [r =0],16(/2) = 8 [r =0], 8 (/2) = 4 [r =0],4(/2) = 2 [r =0], 2 (/2) = 1 [r =0],1(/2) = 0 [r =1], } and {[0.37761(2) =0+ 0.75522], [0.75522(2) = 1+ 0.51044], [0.51044 (2) = 1+0.02088], [0.02088 (2) = 0+0.04176], [0.04176 (2) = 0+0.08352] ...} so: 4192.37761 = $1000001100000.0110000010101011_2$ that is covered to hexadecimal 1060.60AB0C88A4

Complete the following review questions in Chapter 4 of *Computer Hardware, Systems Software, & Networking*:

4.2 Name the three standards in common use for alphanumeric characters. Which standard is designed to support all of the world's written languages? Which language is used primarily with legacy programs that execute on mainframe computers?

-The three standards used for alphanumeric characters are Unicode, ASCII (American Standard Code for Information Interchange) and EBCDIC (Extended Binary Coded Decimal Interchange Code).

-Unicode is the one designed to support all of the world's written languages.

- EBCDIC is the language that's primarily used with old IBM mainframe computers.

4.3 What is the relationship between the ASCII Latin-1 character set and its Unicode equivalent that makes conversion between the two simple?

The ASCII Latin-1 code set is a subset of Unicode so that's why conversion from ASCII to Unicode is particularly simple.

4.5 Name at least four alternative devices that can be used as sources of alphanumeric character input data.

1- Optical character recognition, 2- Bar code reader, 3- Magnetic stripe readers, 4- RFID input, 5- Voice input.

4.7 What is image *metadata*? Give an at least three examples of metadata that would be required for a bitmap image.

Metadata is the information that's system must store and pass along its description or interpret the meaning of its data, some metadata that is required for type of graphical image, the number of colors represented by each data point, the method used to represent each color, the order in which data points are stored.

4.7(EXERCISE questions) Write a program in your favorite language that will convert all ASCII uppercase and lowercase letters to EBCDIC code. For an additional challenge, also convert the punctuation symbols, indicating with a failure-to-convert message, those symbols that are not represented in the EBCDIC system.

*for this question, do not write code. Provide what the code would have to do.

1- Fetch EBCIC codes for letters and store then in variables with string type that hold same mean in ASCII.

2- Build a function to convert ASCII to EBCFIC for all the variables you initialized (so that that only EBCFIC code which have a parallel meaning in ASCII can appear when you enter an ASCII letters) by using if statement as followed:

If the ASCII letter has a parallel meaning in EBCFIC change the input value into parallel EBCFIC code

Else display an error message "Unable to convert"

End If

3- Print if statement output