

COMP1002

Assignment 1 (Q1, Q2, and Q3)

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Q1

1. Convert 10323646520 to decimal:

$$0*8^0 + 2*8^1 + 5*8^2 + 6*8^3 + 4*8^4 + 6*8^5 + 3*8^6 + 2*8^7 + 3*8^8 + 0*8^9 + 1*8^{10} = 1129270608$$

Decimal form= 1129270608

2. Convert 1129270608 from decimal to hexadecimal:

$$1129270608 / 16 = 70579413$$

(Remainder = 0)

$$70579413 / 16 = 4411213$$

(Remainder = 5)

$$4411213 / 16 = 275700$$

(Remainder = 13)

$$275700 / 16 = 17231$$

(Remainder = 4)

$$17231 / 16 = 1076$$

(Remainder = 15)

$$1076 / 16 = 67$$

(Remainder = 4)

$$67 / 16 = 4$$

(Remainder = 3)

$$4 / 16 = 0$$

(Remainder = 4)

Hence, the hexadecimal number is **434F4D50**

3. Hexadecimal to ASCII:

4. 43 4F 4D 50

43 = **C**

4F = **O**

4D = **M**

50 = **P**

Hence the code is **COMP**

Q2

Input: The given 2D Grayscale image made of pixels in the form of a matrix of values of intensity (integers)

Output: The value/ The element in the Matrix that occurs most frequently

Let M be the given 2D Greyscale Image # the matrix

Let rows be the number of rows in M

Let col be the number of columns in M

Let highcount=0 # The number of times the highest frequency element was repeated

For i in [0...rows] do

 For j in [0...col] do

 Let count=0 # The number of times each element was repeated

 Let search=M[i][j]

 For k in [0...rows] do

 For l in [0...col] do

 If M[k][l] is equal to search, increment count by 1

 If highcount is less than count, highcount=count and let val= M[i][j]

Display “The element that appears most frequently is: “

Display val # Val is the intensity value that appears most frequently

Q3

I act like a **function** because I take in several inputs to return an output.

Inputs:

- Document of technical specifications
- Numerous cups of coffee

Output:

- The business application software package

Here, the function (me) uses the technical specifications and the coffee, processes it (performs tasks on it), and uses it to create the software. Since I **return an output** (the software), I do not act like a procedure.

Some tasks are completed that the user does not see. For instance, the setting up of the software documentation tool. I, the software developer, am treated as a **black box** because the details of how I make the software is left unsaid.

I can use a different set of technical specifications and create another software. This implies that I can be used or “**called**” again just like the way a function can be called multiple times in a program.

In the above way, I act as a function.