Spring 2021
CSE 215
Assignment 01

Question 01 :

```
public class Theory_Assignment1 {
    public static calculateFofN (int N) {
        double result, a, b;
        int x = n-1;
        int y = n-2;

        if (n <=0 )
            result = 0;
        else if (n == 1)
            Return = 1;
            result
        else if ( n == 2)
            Return = 3;
            result
        else if (n % 2 == 0) {
            a = calculateFofN (x);
            b = calculateFofN (y);
            result = Math.sqrt (a) + Math.pow (b, (1.0/y));
        }
        else {
            a = calculate FofN (x);
            result = Math.pow (a, 1.000001);
        }
        return result;
    }
```

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```
public static double CalculateIteration(int n){
    double result, a, b;
    int x, y;
    double[] array = new double[n+3];
    array[0] = 0; array[1] = 1; array[2] = 3;

    if (n<=0)
      result = array[0];
    else if (n==1)
      result = array[1];
    else if (n==2)
      result = array[2];
    else {
      for (int index = 3; index<=n; index++)
      {
        x = index-1;
        y = index-2;
        a = CalculateIteration(x);
        b = CalculateIteration(y);

        if (index%2==0)
          array[index] = Math.sqrt(a)
                + Math.pow(b,(1.0/y));
        if (index%2==1)
          array[index] = Math.pow(a, 1.000001);
      }
      result = array[n];
    }
    return result;
}
```

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```
public static void PrintFunctionValues () {
    System.out.printf("%s %25s %25s\n", "Index I",
                      "Iteration I", "Recursion I");
    System.out.println("-------------------------
    -------------------------------------");

    for (int i = 0; i <= 20; i++)
    {
        System.out.printf("%3d | %25.2f | %25.2f\n",
                          i, CalculateIteration(i), calculateFuncN(i));
    }
}

public static void main (String[] args) {
    PrintFunctionValues ();
}
```

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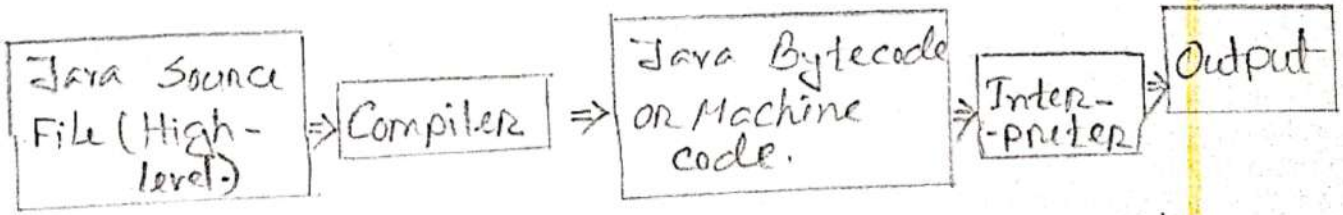
Question 02:

Explain how java code is converted to binary output - What are the steps involved. Explain the difference between interpretation and compilation.

Answer:

The java language is a high-level language, but java bytecode is a low level language. The java compiler generates a bytecode file with a .class extension.

First java source code is compiled into Java byte code and then Java bytecode is interpreted by the JVM or Java Virtual Machine.



To execute a java program is to run the bytecode. The bytecode can run on any other platform that has JVM, which is a program that interprets java bytecode.

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An interpreter reades one statement of the program from the source code at a time and translate it the to the machine code. Then executes the code.

On the other hand, a compiler scans the entire program and translates the whole source code file into a machine code file at once and then executes the machine code file.

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