Assignment No – 2

Q 1): Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.

```
import  java.util.Scanner;

class Prime   {

public static void main(String[] args)  {

int n, p;
Scanner s=new Scanner(System.in);
System.out.println("Enter a number: ");
n=s.nextInt();
for(int i=2;i<n;i++)        {
p=0;
for(int j=2;j<i;j++){
if(i%j==0)
p=1;
 }

if(p==0)
System.out.println(i);
}
  }
```

/*Output*/

```
Enter a number :15
2
3
5
7
11
```

Q 2): Write a Java program to multiply two given matrices.

```
import java.util.Scanner;

class Matrix   {
   public static void main(String args[])   {

int m, n, p, q, sum = 0, c, d, k;

Scanner in = new Scanner(System.in);
 System.out.println("Enter the number of rows and columns of first matrix");
      m = in.nextInt();
      n = in.nextInt();
```

```
    int first[][] = new int[m][n];

    System.out.println("Enter elements of first matrix");

    for (c = 0; c < m; c++)
      for (d = 0; d < n; d++)
        first[c][d] = in.nextInt();

    System.out.println("Enter the number of rows and columns of second matrix");
    p = in.nextInt();
    q = in.nextInt();

    if (n != p)
      System.out.println("The matrices can't be multiplied with each other.");
    else
    {
      int second[][] = new int[p][q];
      int multiply[][] = new int[m][q];

      System.out.println("Enter elements of second matrix");

      for (c = 0; c < p; c++)
        for (d = 0; d < q; d++)
          second[c][d] = in.nextInt();

      for (c = 0; c < m; c++)
      {
        for (d = 0; d < q; d++)
        {
          for (k = 0; k < p; k++)
          {
            sum = sum + first[c][k]*second[k][d];
          }

          multiply[c][d] = sum;
          sum = 0;
        }
      }

      System.out.println("Product of the matrices:");

      for (c = 0; c < m; c++)
      {
        for (d = 0; d < q; d++)
          System.out.print(multiply[c][d]+"\t");

        System.out.print("\n");
      }
    }
  }
}
```

/*Output */

```
Enter the number of rows and columns of first matrix  2   2
Enter elements of first matrix
2
2
2
2
Enter the number of rows and columns of second matrix  2   2
Enter elements of second matrix
3
3
3
3
Product of the matrices:
12      12
12      12
```

Q 3): Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers.

```
import java.util.*;
class Sumtoken {
public static void main(String args[])          {
Scanner scr=new Scanner(System.in);
System.out.println("\nEnter sequence of integers with space b/w them and press enter : ");

String digit=scr.nextLine();
StringTokenizer token=new StringTokenizer(digit);
 int dig=0,sum=0;
 System.out.println("\nEntered digits are : ");

while(token.hasMoreTokens())            {

String s=token.nextToken();
 dig=Integer.parseInt(s);
 System.out.print(dig+" ");
 sum=sum+dig;
     }
      System.out.println();
      System.out.println("Sum is : "+sum);
           }
}
```

/*Output*/

```
Enter sequence of integers with space b/w them and press enter :
1 2 3 4 5 6
Entered digits are :
1 2 3 4 5 6Sum is : 21
```

Q 4): Write a Java program that prints all real solutions to the quadratic equation ax2 + bx + c = 0. Read in a, b, c and use the quadratic formula. If the discriminant b2 -4ac is negative, display a message stating that there are no real solutions.

```
import java.io.*;
class Quadratic  {
        public static void main(String args[])throws IOException {

double p,q,r,y1,y2,discrimnant;
BufferedReader qr=new BufferedReader(new InputStreamReader(System.in));
System.out.println("Enter the values of p,q pnd r:");
p=Integer.parseInt(qr.readLine());
q=Integer.parseInt(qr.readLine());
r=Integer.parseInt(qr.readLine());
discrimnant=((q*q)-(4*p*r));
System.out.println("Discrimnant value is:"+discrimnant);
if(discrimnant<0)
                        {
System.out.println("There is no real solution of the given equation");
}

else  {

y1=((-q)-Math.sqrt(((q*q)-(4*p*r))))/(2*p);
y2=((-q)+Math.sqrt(((q*q)-(4*p*r))))/(2*p);

System.out.println("So the solution of the given quadratic equation are:");
System.out.println("First root value="+y1);
System.out.println("Second root value="+y2);
                        }
        }
}
```

/*Output*/

```
Enter the values of p,q pnd r:
2
3
4
Discrimnant value is:-23.0
There is no real solution of the given equation
```

Q 5): Write a Java program to perform various operations on a string class without using language supported built-in string functions.

- **Read a string**
- **Display the string**
- **Reverse the string**
- **Copy the string into an empty string**
- **Concatenate two strings**

```
import java.io.*;

class Operation     {

public static void main(String args[])   throws IOException {

String str1,str2;
char[] ch1,ch2;
int select;
str1="";   str2="";

BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
while(true)   {
                        System.out.println("Menu Display");
                        System.out.println("1.Read a String");
                        System.out.println("2.Display a String");
                        System.out.println("3.Reverse a String");
                        System.out.println("4.Copy the String into an empty string");
                        System.out.println("5.Concatenate the two given string");
                        System.out.println("6.Quit");

                        System.out.println("Enter your Selection:");
                        select=Integer.parseInt(br.readLine());

                        switch(select)   {
                        case 1:
                                System.out.println("Enter any string");
                                str1=br.readLine();
                                break;
                        case 2:
                                System.out.println("String1 is:"+str1);
                                break;
                        case 3:
                                System.out.println("Enter any String");
                                str1=br.readLine();
                                ch1=str1.toCharArray();
                                int j=ch1.length-1;
                                ch2=new char[ch1.length];
                                for(int i=0;i<ch1.length;i++)
                                {
                                        ch2[j--]=ch1[i];
                                }
```

```
                    str2=new String(ch2);
                    System.out.println("Reverse of the String " +str1+" is: "+str2);
                    break;
                case 4:
                    System.out.println("Enter any String");
                    str1=br.readLine();
                    ch1=str1.toCharArray();
                    str2=new String(ch1);
                    System.out.println("After copying string1 to string2, String2 is:" +str1);
                    break;
                case 5:
                    System.out.println("Enter any String");
                    str1=br.readLine();
                    System.out.println("Enter another String");
                    str2=br.readLine();
                    System.out.println("Concatenation of the two given string is:");
                    System.out.println(str1+str2);
                    break;
                case 6:
                    System.exit(1);

                default:

                    System.out.println("Wrong Selection!!!");
                }
            }
        }
}
```

/*Output*/

```
Menu Display
1.Read a String
2.Display a String
3.Reverse a String
4.Copy the String into an empty string
5.Concatenate the two given string
6.Quit
Enter your Selection:
1
Enter any string :  It is Raining
Menu Display
1.Read a String
2.Display a String
3.Reverse a String
4.Copy the String into an empty string
5.Concatenate the two given string
6.Quit
Enter your Selection:
2
String1 is :  It is Raining
```

Menu Display

1.Read a String
2.Display a String
3.Reverse a String
4.Copy the String into an empty string
5.Concatenate the two given string
6.Quit
Enter your Selection:
3
Enter any String
Javase
Reverse of the String Java is: esavaJ

Menu Display

1.Read a String
2.Display a String
3.Reverse a String
4.Copy the String into an empty string
5.Concatenate the two given string
6.Quit
Enter your Selection:
6

Q6):Write a program in Java to calculate TA,DA,HRA,IT,PF,CA and Print The Payroll Slip of the Employee after the Deduction.

```
import java.util.*;
class  Employee
{
public static void main(String arg[])
{
Scanner ob= new Scanner(System.in);
Double basic_sal,HRA,DA,TA,CA,IT=0.0,PF=0.0,Gross_sal,deduct,Net_sal;
System.out.println("Enter the Basic Salary");
basic_sal=Double.parseDouble(ob.nextLine());
HRA=-0.15*basic_sal;
DA=0.07*basic_sal;
TA=0.65*basic_sal;
CA=0.09*basic_sal;
if(basic_sal>=200000&&basic_sal<=500000)
{
PF=0.12*basic_sal;
IT=0.11*basic_sal;
}
if(basic_sal>=100000&&basic_sal<=200000)
{
PF=0.11*basic_sal;
IT=0.09*basic_sal;
```

```
}
if(basic_sal>=50000&&basic_sal<=100000)
{
PF=0.09*basic_sal;
IT=0.07*basic_sal;
}
Gross_sal=basic_sal+HRA+DA+TA+CA;
deduct=PF+IT;
Net_sal=Gross_sal-deduct;
System.out.println("Employee Payroll Slip");
System.out.println("Basic Salary="+basic_sal);
System.out.println("TA="+TA);
System.out.println("DA="+DA);
System.out.println("HRA="+HRA);
System.out.println("CA="+CA);
System.out.println("IT Deduction="+IT);
System.out.println("PF Deduction="+PF);
System.out.println("Gross Salary="+Gross_sal);
System.out.println("Net Salary="+Net_sal);
}
}
```

/*Output*/

```
Enter the Basic Salary
10000000

Employee Payroll Slip

Basic Salary=1.0E7
TA=6500000.0
DA=700000.0000000001
HRA=1500000.0
CA=900000.0
IT Deduction=0.0
PF Deduction=0.0
Gross Salary=1.96E7
Net Salary=1.96E7
```

Q7):Write a program to sort a given list of numbers(Free to use any Sorting Algorithm).

```
import java.util.Scanner;
class Sort
{
public static void main(String[] args)
   {
      int n, temp;
      Scanner s = new Scanner(System.in);
      System.out.print("Enter no. of elements you want in array:");
```

```
        n = s.nextInt();
        int a[] = new int[n];
        System.out.println("Enter all the elements:");
        for (int i = 0; i < n; i++)
        {
            a[i] = s.nextInt();
        }
        for (int i = 0; i < n; i++)
        {
            for (int j = i + 1; j < n; j++)
            {
                if (a[i] > a[j])
                {
                    temp = a[i];
                    a[i] = a[j];
                    a[j] = temp;
                }
            }
        }
        System.out.print("Ascending Order:");
        for (int i = 0; i < n - 1; i++)
        {
            System.out.print(a[i] + ",");
        }
        System.out.print(a[n - 1]);
    }
}
```

/*Output*/

```
Enter no. of elements you want in array:5
Enter all the elements:
18
36
15
7
53
Ascending Order:7 ,15 ,18, 36, 53
```