# ASSIGNMENT-1

**PROBLEM STATEMENT:** Define a class named PrimeNumbers with the following description:
**Instance variables/data members:**

- int start – To store the start value
- int end – To store the end value

**Member methods:**

- PrimeNumbers() – Default Constructor.
- void setRange( ) – To input and store the start and end.
- boolean isPrime(int) – To check whether a number is Prime or not.
- void printList() – To display all the prime numbers between start and end.

Write a main method to use the object the class PrimeNumbers to print prime number between a given ranges.

**SOURCE CODE (JAVA):**

```
import java.util.*;

public class PrimeNumbers{
   int start;
   int end;

   public PrimeNumbers(){
      setRange();
      printList();
   }
   public void setRange(){
      Scanner sc=new Scanner(System.in);
      System.out.print("Enter Starting point: ");
      start=sc.nextInt();
      System.out.print("Enter End point: ");
      end = sc.nextInt();
   }
   public boolean isPrime(int a){
      if(a == 0 || a == 1){
         return false;
      }
      else{
         for(int i=2; i<=a/2; i++){
            if(a%i == 0)
               return false;
         }
         return true;
      }
   }
   public void printList(){
      System.out.println("The Prime numbers are:");
      while(start <= end){
         if(isPrime(start)){
            System.out.println("[" + start + "]");
         }
         start ++;
      }
   }
```

```
   public static void main(String args[]){
      PrimeNumbers p = new PrimeNumbers();
   }
}
```

**OUTPUT:**

```
D:\PROGRAM\JAVA\M.SC\ASSIGNMENT_EXAM\code> javac PrimeNumbers.java
D:\PROGRAM\JAVA\M.SC\ASSIGNMENT_EXAM\code> java PrimeNumbers
Enter Starting point: 0
Enter End point: 20
The Prime numbers are:
[2]
[3]
[5]
[7]
[11]
[13]
[17]
[19]

D:\PROGRAM\JAVA\M.SC\ASSIGNMENT_EXAM\code>
```

# ASSIGNMENT-2

**PROBLEM STATEMENT:** Write a program in Java to input N strings into a String array and sort them in dictionary order.

**SOURCE CODE (JAVA):**

```
import java.util.*;

public class StringSort{
   String[] str;
   int n;

   void getData(){
      Scanner sc = new Scanner(System.in);
      System.out.print("Enter total number of Strings: ");
      n = sc.nextInt();
      str = new String[n];
      System.out.println("Enter your strings one by one: ");
      Scanner sc_str = new Scanner(System.in);
      for(int i=0; i<n; i++){
         str[i] = sc_str.nextLine();
      }
   }
   public void printData(){
      System.out.println("Your sorted output is: ");
      for(int i=0; i<n; i++){
         System.out.println(str[i]);
      }
   }
   public void sortString(){
      for (int i=0; i<n; i++){
         for (int j=i+1; j<n; j++){
            if (str[i].compareTo(str[j])>0){
               String temp = str[i];
               str[i] = str[j];
               str[j] = temp;
            }
         }
      }
   }
   public static void main(String args[]){
      StringSort ss = new StringSort();
      ss.getData();
      ss.sortString();
      ss.printData();
   }
}
```

**OUTPUT:**

```
D:\PROGRAM\JAVA\M.SC\ASSIGNMENT_EXAM\code> javac StringSort.java
D:\PROGRAM\JAVA\M.SC\ASSIGNMENT_EXAM\code> java StringSort
Enter total number of Strings: 4
Enter your strings one by one:
Luffy
Zoro
Sanji
Nami
Your sorted output is:
Luffy
Nami
Sanji
Zoro

D:\PROGRAM\JAVA\M.SC\ASSIGNMENT_EXAM\code>
```

# ASSIGNMENT-3

**PROBLEM STATEMENT:** Create a class named 'Member' having the following members:
**Data members:**
1 – Name
2 – Age
3 - Phone number
4 – Address
5 – Salary
It also has a method named 'printSalary' which prints the salary of the members. Two classes 'Employee' and 'Manager' inherits the 'Member' class. The 'Employee' and 'Manager' classes have data members 'specialization' and 'department' respectively. Now, assign name, age, phone number, address and salary to an employee and a manager by making an object of both of these classes and print the same.

**SOURCE CODE (JAVA):**

```
import java.util.*;

class Member{
   String name;
   int age;
   String phone_number;
   String address;
   int salary;

   Member(String name, int age, String phone_number, String address, int salary){
      this.name = name;
      this.age = age;
      this.phone_number = phone_number;
      this.address = address;
      this.salary = salary;
   }
   public void printSalary(){
      System.out.println("SALARY: " + salary);
   }
}

class Employee extends Member{
   String specialization;

   Employee(String name, int age, String phone_number, String address, int salary, String specializatio
n){
      super(name, age, phone_number, address, salary);
      this.specialization = specialization;
   }
   public void printData(){
      System.out.println("Details of the Employee: ");
      System.out.println("NAME: " + name);
      System.out.println("AGE: "+ age);
      System.out.println("PHONE NUMBER: " + phone_number);
      System.out.println("ADDRESS: " + address);
      printSalary();
      System.out.println("SPECIALIZATION: " + specialization);
```

```
    }
}

class Manager extends Member{
    String department;

    Manager(String name, int age, String phone_number, String address, int salary, String department){
        super(name, age, phone_number, address, salary);
        this.department = department;
    }
    public void printData(){
        System.out.println("Details of the Manager: ");
        System.out.println("NAME: " + name);
        System.out.println("AGE: "+ age);
        System.out.println("PHONE NUMBER: " + phone_number);
        System.out.println("ADDRESS: " + address);
        printSalary();
        System.out.println("DEPARTMENT: " + department);
    }
}

public class Main{
    public static void main(String args[]){
        String str;
        Scanner sc = new Scanner(System.in);
        Scanner sc_str = new Scanner(System.in);    //! To use nextLine()
        while(true){
            System.out.println("1 to Enter data for 'Employee'\n2 to Enter data for 'Manager'");
            System.out.print("Press any other number to 'Exit'\nEnter your choice... ");

            int choice = sc.nextInt();
            if(choice == 1){
                System.out.println("\nEnter details for Employee...");
                System.out.print("SPECIALIZATION: ");
                str = sc_str.nextLine();;    //! Here str holds specialization

            }
            else if(choice == 2){
                System.out.println("Enter details for Manager...");
                System.out.print("DEPARTMENT: ");
                str = sc_str.nextLine();;    //! Here str holds department
            }
            else{
                break;
            }
            System.out.print("NAME: ");
            String name = sc_str.nextLine();
            System.out.print("AGE: ");
            int age = sc.nextInt();
            System.out.print("PHONE NUMBER: ");
            String phone_number = sc.next();
            System.out.print("ADDRESS: ");
            String address = sc_str.nextLine();
            System.out.print("SALARY: ");
```

```
        int salary = sc.nextInt();
        System.out.print("\n");

        if(choice == 1){
           Employee emp = new Employee(name, age, phone_number, address, salary, str);
           emp.printData();
           System.out.print("\n");
        }
        else{
           Manager mng = new Manager(name, age, phone_number, address, salary, str);
           mng.printData();
           System.out.print("\n");
        }
     }
  }
}
```

**OUTPUT:**

```
D:\PROGRAM\JAVA\M.SC\ASSIGNMENT_EXAM\code> javac Main.java
D:\PROGRAM\JAVA\M.SC\ASSIGNMENT_EXAM\code> java Main
1 to Enter data for 'Employee'
2 to Enter data for 'Manager'
Press any other number to 'Exit'
Enter your choice... 1

Enter details for Employee...
SPECIALIZATION: Python Programming
NAME: Deep Dey
AGE: 22
PHONE NUMBER: 8697448896
ADDRESS: Halisahar
SALARY: 2000

Details of the Employee:
NAME: Deep Dey
AGE: 22
PHONE NUMBER: 8697448896
ADDRESS: Halisahar
SALARY: 2000
SPECIALIZATION: Python Programming

1 to Enter data for 'Employee'
2 to Enter data for 'Manager'
Press any other number to 'Exit'
Enter your choice... 2
Enter details for Manager...
DEPARTMENT: Computer Science
NAME: Pranay Mandal
AGE: 22
PHONE NUMBER: 8697448895
ADDRESS: Burdwan
SALARY: 25000
```

```
Details of the Manager:
NAME: Pranay Mandal
AGE: 22
PHONE NUMBER: 8697448895
ADDRESS: Burdwan
SALARY: 25000
DEPARTMENT: Computer Science

1 to Enter data for 'Employee'
2 to Enter data for 'Manager'
Press any other number to 'Exit'
Enter your choice... 3

D:\PROGRAM\JAVA\M.SC\ASSIGNMENT_EXAM\code>
```

# ASSIGNMENT-4

**PROBLEM STATEMENT:** There are two files called 'Country.txt' and 'Capital.txt'. 'Country.txt' has 10 country names in each line and 'Capital.txt' has corresponding capitals in each lines. Write a JAVA program to create a file named 'CountryCapitals.txt' by concatenating the contents from both files. For each entry in 'County.txt' and 'Capital.txt' add an entry in 'CountryCapitals.txt' saying "The Capital of Country1 is Captial1". Display the content of the 'CountryCapital.txt file'.

**SOURCE CODE (JAVA):**

```
import java.io.*;
import java.util.*;

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

      File country = new File("files\\Country.txt");
      File capital = new File("files\\Capital.txt");
      FileWriter countryCapital = new FileWriter("files\\CountryCapital.txt");

      if(country.exists() && capital.exists()){
         Scanner scCountry = new Scanner(country);
         Scanner scCapital = new Scanner(capital);

         while (scCountry.hasNextLine() && scCapital.hasNextLine()){
            countryCapital.write("The Capital of " + scCountry.nextLine() + " is " + scCapital.nextLine() + "
\n");
         }
         countryCapital.close();
      }
      else{
         System.out.println("Files are missing...");
      }
   }
}
```

**OUTPUT:** [After compilation and run this code there generate (if file not exist) a file 'CountryCapital.txt' and write(if exist overwrite the previous text) the following output inside the file]

```
The Capital of Afghanistan is Kabul
The Capital of Australia is Canberra
The Capital of Bangladesh is Dhaka
The Capital of Bhutan is Thimphu
The Capital of China is Beijing
The Capital of France is Paris
The Capital of Germany is Berlin
The Capital of India is New Delhi
The Capital of Japan is Tokyo
The Capital of Nepal is Kathmandu
```

# ASSIGNMENT-5

**PROBLEM STATEMENT:** Write a Java program to input principal, time and interest rate as command line argument and find the interest. Give user 2nd change to enter the values of principal, time and interest if values are not passed as command line arguments.

**SOURCE CODE (JAVA):**

```
import java.util.*;

public class InterestCalculation{
   public static void main(String args[]){
      int principal;
      int time;
      int rate;
      float interest;
      int flag = 0;

      try{
         principal = Integer.parseInt(args[0]);
         time = Integer.parseInt(args[1]);
         rate = Integer.parseInt(args[2]);
         System.out.println("Principal: " + principal);
         System.out.println("Time (months): " + time);
         System.out.println("rate of Interest (%): " + rate);

         interest = (float)(principal * time * rate) / (float)100;
         System.out.println("Total amount of interest: "+ interest);
      }catch (NumberFormatException e) {
         System.out.println("Arguments must be integers...");
         flag = 1;
      }catch(ArrayIndexOutOfBoundsException e){
         System.out.println("No. of argument is not enough...");
         flag = 1;
      }
      if(flag == 1){
         try{
            Scanner sc = new Scanner(System.in);
            System.out.print("\nEnter Principal: ");
            principal = sc.nextInt();
            System.out.print("Enter time (months): ");
            time = sc.nextInt();
            System.out.print("Enter rate of interest: ");
            rate = sc.nextInt();

            interest = (float)(principal * time * rate) / (float)100;
            System.out.println("Total amount of interest: "+ interest);
         }catch(InputMismatchException e){
            System.out.println("Again you enter wrong input...\nStart again from beginning");
            System.exit(1);
         }
      }
   }
}
```

**OUTPUT:**

```
D:\PROGRAM\JAVA\M.SC\ASSIGNMENT_EXAM\code>javac InterestCalculation.java
D:\PROGRAM\JAVA\M.SC\ASSIGNMENT_EXAM\code>java InterestCalculation 11000 10 3
Principal: 11000
Time (months): 10
rate of Interest (%): 3
Total amount of interest: 3300.0

D:\PROGRAM\JAVA\M.SC\ASSIGNMENT_EXAM\code>java InterestCalculation
No. of argument is not enough...

Enter Principal: 25000
Enter time (months): 12
Enter rate of interest: 2
Total amount of interest: 6000.0

D:\PROGRAM\JAVA\M.SC\ASSIGNMENT_EXAM\code>java InterestCalculation
No. of argument is not enough...

Enter Principal: 22000
Enter time (months): 12
Enter rate of interest: deep
Again you enter wrong input...
Start again from beginning

D:\PROGRAM\JAVA\M.SC\ASSIGNMENT_EXAM\code>
```

# ASSIGNMENT-6

**PROBLEM STATEMENT:** Write a Java program to create a progress bar using thread that propagates from 0% to 100% in steps of 10%.

**SOURCE CODE (JAVA):**

```
public class ProgressBar{
   public static void main(String args[]) throws Exception{
      for(int i=0; i<=10; i++){
         System.out.print("\033[H\033[2J");
         System.out.println("My Progress Bar:");
         for(int j=0; j<i; j++){
            System.out.print("= ");
         }
         System.out.print(i*10 + "%");
         Thread.sleep(500);
      }
   }
}
```

**OUTPUT:** [Here I show change of output in each step]
**Initial State:**
0%
**State 1:**
Final Output:
= 10%
**State 2:**
Final Output:
= = 20%
**State 3:**
Final Output:
= = = 30%
**State 4:**
Final Output:
= = = = 40%
**State 5:**
Final Output:
= = = = = 50%
**State 6:**
Final Output:
= = = = = = 60%
**State 7:**
Final Output:
= = = = = = = 70%
**State 8:**
Final Output:
= = = = = = = = 80%
**State 9:**
Final Output:
= = = = = = = = = 90%
**Final State:**
Final Output:
= = = = = = = = = = 100%