Appendix

LAB PROGRAMS

PART - A

Program 1 Write a simple Java application to print the message, "Welcome to Java".

```
public class Welcome {
public static void main(String args[]) {
   System.out.println("Welcome to Java");
 }
}
```

Output

```
Welcome to Java
```

Program 2 Write a program to display the month of a year. Months of the year should be held in an array.

```
import java.util.Calendar;

public class dateDemo {
public static void main(String[] args) {
   Calendar calendar = Calendar.getInstance();
   String[] month = { "January", "February", "March", "April", "May", "June",
              "July", "August", "September", "October", "November", "December" };

   System.out.println("Current Month = " + month[calendar.get(Calendar.MONTH)]);
 }
}
```

Output

```
Current Month = August
```

Program 3 Write a program to demonstrate a division by zero exception

```
public class DivisionByZeroDemo {
   public static void main(String[] args) {
     int a = 5;
     int b = 0;
     try {
         System.out.println(a / b);
     } catch (ArithmeticException e) {
         System.out.println("Division by Zero is not possible");
     }
   }
}
```

Output

```
Division by Zero is not possible
```

Program 4 Write a program to create a user defined exception say Pay Out of Bounds.

```
import java.util.*;

class PayoutOfBoundsException extends Exception {

    PayoutOfBoundsException(String msg) {
      System.out.println("Pay Out of Bounds Exception : " + msg);
    }
}

public class UserDefinedExceptionDemo {

    public static void main(String argv[]) throws PayoutOfBoundsException {
      System.out.print("Enter the Employee Salary: ");
      Scanner sc = new Scanner(System.in);
      int pay = sc.nextInt();
      if (pay < 10000 || pay > 50000) {
           throw new PayoutOfBoundsException("Salary not in the valid range");
      } else
           System.out.println("Employee eligible for 30% hike");
    }
}
```

Output

```
Enter the Employee Salary: 9000
Pay Out of Bounds Exception : Salary not in the valid range
Exception in thread "main" PayoutOfBoundsException
at UserDefinedExceptionDemo.main(UserDefinedExceptionDemo.java:18)
```

Program 5 Write a java program to add two integers and two float numbers. When no arguments are supplied, give a default value to calculate the sum. Use function overloading.

```
public class MethodOverloadingDemo {

    int addition() {
      return (10 + 10);
    }

    int addition(int x, int y) {
      return (x + y);
    }

    float addition(float a, float b) {
      return (a + b);
    }
```

```
public static void main(String args[]) {
  MethodOverloadingDemo a = new MethodOverloadingDemo();
  System.out.println("By Using Default Values, Sum is : " + a.addition());
  System.out.println("Sum of Two Integer Values(10 and 20) is: " + a.addition(10, 20));
  System.out.println("Sum of Two Float values(10.5 and 20.5) is: " + a.addition(10.2f, 20.3f));

 }
}
```

Output

```
By Using Default Values, Sum is : 20
Sum of Two Integer Values(10 and 20) is: 30
Sum of Two Float values(10.5 and 20.5) is: 30.5
```

Program 6

Write a program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Create another class called MulDiv that extends from AddSub class to use the member data of the super class. MulDiv should have methods to multiply and divide. A main function should access the methods and perform the mathematical operations.

```
class AddSub {
  int n1, n2;

  public AddSub(int x, int y) {
    n1 = x;
    n2 = y;
  }

  public int add() {
    return (n1 + n2);
  }

  public int sub() {
    return (n1 - n2);
  }
}
```

```
class MulDiv extends AddSub {

  public MulDiv(int x, int y) {
    super(x, y);
  }

  public int mul() {
    return (n1 * n2);
  }

  public int div() {
    return (n1 / n2);
  }
}
```

```
public class AirthmeticOperations {
  public static void main(String args[]) {
    MulDiv obj = new MulDiv(20, 10);
    System.out.println("Sum of 20 and 10 =" + obj.add());
    System.out.println("Difference of 20 and 10 =" + obj.sub());
    System.out.println("Product of 20 and 10 =" + obj.mul());
    System.out.println("Result of division 20/10 =" + obj.div());
  }
}
```

Output

```
Sum of 20 and 10 =30
Difference of 20 and 10 =10
Product of 20 and 10 =200
Result of division 20/10 =2
```

Program 7 Write a program with class variable that is available for all instances of a class. Use static variable declaration. Observe the changes that occur in the object's member variable values.

```
class Student {
    static String collegeName = "PES College";
    int rollNo;
    String name;

    Student(int rollno, String name) {
      this.rollNo = rollno;
      this.name = name;
    }

    void display() {
      System.out.println(collegeName + " " + rollNo + " " + name);
    }
}

public class StaticDemo {
    public static void main(String args[]) {
      System.out.println("Objects Sharing the Static Variable - College Name \n");
      Student s1 = new Student(1001, "Srikanth");
      Student s2 = new Student(1002, "Indumathi");
      s1.display();
      s2.display();
      System.out.println("\nStatic Value Changed by One of the Object \n");
      s1.collegeName = "Jain College";
      s1.display();
      s2.display();
    }
}
```

Output

```
Objects Sharing the Static Variable - College Name
PES College 1001 Srikanth
PES College 1002 Indumathi
Static Value Changed by One of the Object
Jain College 1001 Srikanth
Jain College 1002 Indumathi
```

Program 8 Write a java program to create a student class with following attributes: Enrollment_id: Name, Mark of sub1, Mark of sub2, mark of sub3, Total Marks. Total of the three marks must be calculated only when the student passes in all three subjects. The pass mark for each subject is 50. If a candidate fails in any one of the subjects his total mark must be declared as zero. Using this condition write a constructor for this class. Write separate functions for accepting and displaying student details. In the main method create an array of three student objects and display the details.

```
import java.util.*;

class Student {
   Scanner sc = new Scanner(System.in);
   String Enrollment_id;
   String Name;
   int sub1, sub2, sub3, total;

   Student(){
     readStudentInfo();
   }

   public void readStudentInfo() {
     System.out.println("Enter Student Details");
     System.out.println("EnrolmentNo: ");
     Enrollment_id = sc.next();
     System.out.print("Name: ");
     Name = sc.next();
     System.out.print("Enter Marks of 3 Subjects: ");
     sub1 = sc.nextInt();
     sub2 = sc.nextInt();
     sub3 = sc.nextInt();
     if (sub1 >= 50 && sub2 >= 50 && sub3 >= 50)
          total = sub1 + sub2 + sub3;
     else
          total = 0;
   }

   public void displayInfo() {
     System.out.println(Enrollment_id+"\t\t"+Name+"\t"+total);
   }
}
```

```
public class StudentInfo {
    public static void main(String[] args) {
      Student s[] = new Student[3];
      for (int i = 0; i < 3; i++) {
          s[i] = new Student();
      }
      System.out.println("\t\tStudent Details");
      System.out.println("EnrollmentNo\tName\tTotal");
      for (int i = 0; i < 3; i++) {
          s[i].displayInfo();
      }
    }
}
```

Output

```
Enter Student Details
EnrolmentNo: 1001
Name: Rama
Enter Marks of 3 Subjects: 99 87 76
Enter Student Details
EnrolmentNo: 1002
Name: Sita
Enter Marks of 3 Subjects: 89 65 37
Enter Student Details
EnrolmentNo: 1003
Name: Gopi
Enter Marks of 3 Subjects: 10 99 56
    Student Details
EnrollmentNo    Name  Total
1001            Rama  262
1002            Sita  0
1003            Gopi  0
```

Program 9

In a college first year class are having the following attributes.

Name of the class (BCA, BCom, BSc), Name of the staff, No of the students in the class, Array of students in the class.

Define a class called first year with above attributes and define a suitable constructor. Also write a method called bestStudent() which process a first-year object and return the student with the highest total mark. In the main method, define a first-year object and find the best student of this class.

```
import java.util.*;

class FirstYear {
  String classname;
  String classteacher;
  int stdcount;
  int stdmarks[] = new int[50];
  String stdnames[] = new String[50];
  Scanner sc = new Scanner(System.in);

  public FirstYear() {
    getinfo();
  }

  public void getinfo() {
    System.out.println("Please Enter the Class Name:");
    classname = sc.nextLine();
    System.out.println("Please Enter the Class Teacher Name:");
    classteacher = sc.nextLine();
    System.out.println("Please Enter the Total Number of Students of the Class:");
    stdcount = Integer.parseInt(sc.nextLine());

    System.out.println("Please Enter the Names of all the Students of the Class:");
    for (int i = 0; i < stdcount; i++)
        stdnames[i] = sc.nextLine();

    System.out.println("Please Enter the Marks of all the Students of the Class:");
    for (int i = 0; i < stdcount; i++)
        stdmarks[i] = sc.nextInt();
  }

  public void bestStudent() {
    int best = 0, k = -1;
    for (int i = 0; i < stdcount; i++) {
        if (stdmarks[i] > best) {
            best = stdmarks[i];
            k = i;
        }
    }
    System.out.println("The Best Student is " + stdnames[k]);
  }
}
```

```
public class Student {
    public static void main(String args[]) {
      FirstYear fy = new FirstYear();
      fy.bestStudent();
    }
}
```

Output

```
Please Enter the Class Name:BCA
Please Enter the Class Teacher Name: Srikanth
Please Enter the Total Number of Students of the Class:3
Please Enter the Names of all the Students of the Class:
Srikanth
Indu
Rajani
Please Enter the Marks of all the Students of the Class:
456
667
356
The Best Student is Indu
```

Program 10 Write a Java program to define a class called employee with the name and date of appointment. Create ten employee objects as an array and sort them as per their date of appointment. Ie, print them as per their seniority.

```
import java.util.Date;

class Employee {
    String name;
    Date appdate;

    public Employee(String nm, Date apdt) {
       name = nm;
       appdate = apdt;
    }

    public void display() {
       System.out.println("employee name:" + name + "\t  appointment date: \t" +
            appdate.getDate() + "/"+ appdate.getMonth() + "/" + appdate.getYear());
    }
}

public class EmpDate {
    public static void main(String as[]) {
       Employee emp[] = new Employee[10];
       emp[0] = new Employee("Neeraja K", new Date(1999, 05, 22));
```

```
emp[1] = new Employee("Kuldeep M", new Date(2000, 01, 12));
emp[2] = new Employee("Roja D", new Date(2009, 04, 25));
emp[3] = new Employee("Rana K", new Date(2005, 02, 19));
emp[4] = new Employee("Jyothi", new Date(2010, 01, 01));
emp[5] = new Employee("Srikanth", new Date(1999, 01, 01));
emp[6] = new Employee("Rajesh", new Date(2020, 05, 19));
emp[7] = new Employee("Asha", new Date(2022, 04, 22));
emp[8] = new Employee("Ammu", new Date(2000, 01, 25));
emp[9]= new Employee("Gourav", new Date(2002, 9, 9));
System.out.println("List of Employees");
for (int i = 0; i < emp.length; i++)
     emp[i].display();

 for (int i = 0; i < emp.length; i++) {
     for (int j = i + 1; j < emp.length; j++) {
          if (emp[i].appdate.after(emp[j].appdate)) {
               Employee t = emp[i];
               emp[i] = emp[j];
               emp[j] = t;

          }
     }
   }
   System.out.println("\nList of Employees Seniority wise");
   for (int i = 0; i < emp.length; i++)
        emp[i].display();
    }
}
```

Output

```
List of Employees

employee name:Neeraja K      appointment date: 22/5/1999
employee name:Kuldeep M      appointment date: 12/1/2000
employee name:Roja D         appointment date: 25/4/2009
employee name:Rana K         appointment date: 19/2/2005
employee name:Jyothi         appointment date: 1/1/2010
employee name:Srikanth       appointment date: 1/1/1999
employee name:Rajesh         appointment date: 19/5/2020
employee name:Asha           appointment date: 22/4/2022
employee name:Ammu           appointment date: 25/1/2000
employee name:Gourav         appointment date: 9/9/2002
```

```
List of Employees Seniority wise
employee name:Srikanth        appointment date: 1/1/1999
employee name:Neeraja K       appointment date: 22/5/1999
employee name:Kuldeep M       appointment date: 12/1/2000
employee name:Ammu            appointment date: 25/1/2000
employee name:Gourav          appointment date: 9/9/2002
employee name:Rana K          appointment date: 19/2/2005
employee name:Roja D          appointment date: 25/4/2009
employee name:Jyothi          appointment date: 1/1/2010
employee name:Rajesh          appointment date: 19/5/2020
employee name:Asha            appointment date: 22/4/2022
```

Program 11 Create a package 'student. Fulltime.BCA' in your current working directory

a. Create a default class student in the above package with the following attributes: Name, age, sex.

b. Have methods for storing as well as displaying

```
package student.fulltime.bca;
import java.util.Scanner;

public class BCAStudent {

    String name, sex;
    int age;
    Scanner sc = new Scanner(System.in);

    public void getdata() {
       System.out.println("Student Name: ");
       name = sc.nextLine();
       System.out.println("Student Sex: ");
       sex = sc.nextLine();
       System.out.println("Student Age: ");
       age = sc.nextInt();
     }

     public void display() {
       System.out.println("Student Details are ");
       System.out.println("Student Name:" + name);
       System.out.println("Student Age:" + age);
       System.out.println("Student Sex:" + sex);
     }
}
```

Note : Save the above file as BCAStudent.java and Compile.

Folder hierarchy student\fulltime\bca is created and the file BCAStudent.class is placed in bca folder.

// Save this file as PackageDemo.java in outside of the student folder.

```
import student.fulltime.bca.BCAStudent;
public class PackageDemo {
   public static void main(String args[]) {
     BCAStudent std = new BCAStudent();
     std.getdata();
     std.display();
   }
}
```

Output

```
Student Name: Yasashwini
Student Sex: Female
Student Age: 19
Student Details are
Student Name:Yasashwini
Student Age:19
Student Sex:Female
```