Experiment Number: 2 (Encapsulation: Constructor)

Name	**Shreya Shetty**
UID	**2019140059**
Class	**TE IT**
Batch	**D**
Subject	**OOP Lab**

Aim: Create a class 'Employee' with three data members which are name, age and Salary. The constructor of the class assigns default values name as "unknown", age as '0' and salary as "0". It has method assigns name, age and Salary respectively. Print the name, age and Salary of 3 employees sorted according to their age.

Hint - Use array of objects

Program:

```
import java.util.*;
public class exp2 {
    public static void main(String args[]) {
        Scanner sc = new Scanner(System.in);
        // Declaring an array of Employee
        Employee[] arr;
        System.out.print("Enter the number of Employees : ");
        int n = sc.nextInt();
        // Allocating memory for n objects of type Employee
        arr = new Employee[n];
        for(int i=0;i<n;i++)
        {
            int a=0;
            String na;
            while(true)
            {
                System.out.print("Enter the name of Employee "+(i+1)+" : ");
                na= sc.next();//Taking name as input
                if(na != null && (!na.equals("")) && (na.matches("^[a-zA-
Z]*$")))
                    break;
                else
                    System.out.println("Invalid Name! It should consist of a
lphabets only!");
            }
            while(a<18 || a>59)
            {
                System.out.print("Enter the age of Employee "+(i+1)+" (18<=a
ge<60) : ");
                a=sc.nextInt();//Taking age as input
                if(a<18 || a>59)
                    System.out.println("Invalid Age! (18<= Age <60)");
            }
            System.out.print("Enter the salary of Employee "+(i+1)+" : ");
            int sal=sc.nextInt();//Taking salary as input
            arr[i] = new Employee(a,na,sal);// Initializing ith element of  array
```

```
        }
        // Displaying the Employee data
        System.out.println("\n\t\t   EMPLOYEE DATA\n\nArray No.\tName\t\tAge
\t\tSalary");
        for(int i=0;i<n;i++)
        {
            System.out.print(i+"\t\t");
            arr[i].display();
        }
        //Sorting the data in the order of age then salary then name
        Arrays.sort(arr, new Comparator<Employee>() {
            @Override
            public int compare(Employee first, Employee second)
            {
                if (first.getAge() != second.getAge()) {
                    return first.getAge() - second.getAge();
                }
                if (first.getSal() != second.getSal()) {
                    return first.getSal() - second.getSal();
                }
                return first.getName().compareTo(second.getName());
            }
        });
        System.out.println("\n\t\tSORTED EMPLOYEE DATA\n\nArray No.\tName\t\
tAge\t\tSalary");
        for(int i=0;i<n;i++)
        {
            System.out.print(i+"\t\t");
            arr[i].display();
        }

    }
}

// Creating a Employee class with
// id and name as a attributes
class Employee {

    public int age=0;
    public int salary=0;
    public String name="unknown";
    // Employee class constructor
    Employee(int age, String name, int salary) {
        this.age = age;
        this.name = name;
        this.salary = salary;
    }
    // display() method to display the Employee data
    public void display() {
        // System.out.println("Employee name is: "+ name +" ,Employee Age is: " + age+
" and Employee Salary is: " + salary);
        System.out.println(name +"\t\t" + age+ "\t\t" + salary);

    }
    public String getName() {
        return name;
    }
```

```
    public int getAge() {
        return age;
    }
    public int getSal() {
        return salary;
    }
}
```

Output:

Test Case1 -

```
PS D:\PROJECT_AND_CODES\Java> cd "d:\PROJECT_AND_CODES\Java\" ; if ($?) { javac exp2.java } ; if ($?) { java exp2

Enter the number of Employees : 3
Enter the name of Employee 1 : Shruti
Enter the age of Employee 1 (18<=age<60) : 13
Invalid Age! (18<= Age <60)
Enter the age of Employee 1 (18<=age<60) : 20
Enter the salary of Employee 1 : 20000
Enter the name of Employee 2 : Shreya
Enter the age of Employee 2 (18<=age<60) : 20
Enter the salary of Employee 2 : 3000
Enter the name of Employee 3 : Kushal
Enter the age of Employee 3 (18<=age<60) : 19
Enter the salary of Employee 3 : 15000

                  EMPLOYEE DATA

Array No.       Name            Age             Salary
0               Shruti          20              20000
1               Shreya          20              3000
2               Kushal          19              15000

                SORTED EMPLOYEE DATA

Array No.       Name            Age             Salary
0               Kushal          19              15000
1               Shreya          20              3000
2               Shruti          20              20000
PS D:\PROJECT_AND_CODES\Java>
```

Test Case 2 -

```
PS D:\PROJECT_AND_CODES\Java> cd "d:\PROJECT_AND_CODES\Java\" ; if ($?) { javac exp2.java } ; if ($?) { java exp2 }

Enter the number of Employees : 3
Enter the name of Employee 1 : Shreya
Enter the age of Employee 1 (18<=age<60) : 20
Enter the salary of Employee 1 : 30000
Enter the name of Employee 2 : 123
Invalid Name! It should consist of alphabets only!
Enter the name of Employee 2 : Shruti
Enter the age of Employee 2 (18<=age<60) : 19
Enter the salary of Employee 2 : 25000
Enter the name of Employee 3 : Kushal
Enter the age of Employee 3 (18<=age<60) : 19
Enter the salary of Employee 3 : 27000

                  EMPLOYEE DATA

Array No.       Name            Age             Salary
0               Shreya          20              30000
1               Shruti          19              25000
2               Kushal          19              27000

                SORTED EMPLOYEE DATA

Array No.       Name            Age             Salary
0               Shruti          19              25000
1               Kushal          19              27000
2               Shreya          20              30000
PS D:\PROJECT_AND_CODES\Java>
```

Test Case 3 -

```
PS D:\PROJECT_AND_CODES\Java> cd "d:\PROJECT_AND_CODES\Java\" ; if ($?) { javac exp2.java } ; if ($?) { java exp2 }

Enter the number of Employees : 3
Enter the name of Employee 1 : Shreya
Enter the age of Employee 1 (18<=age<60) : 19
Enter the salary of Employee 1 : 30000
Enter the name of Employee 2 : Shruti
Enter the age of Employee 2 (18<=age<60) : 20
Enter the salary of Employee 2 : 25000
Enter the name of Employee 3 : Sh@
Invalid Name! It should consist of alphabets only!
Enter the name of Employee 3 : Kushal
Enter the age of Employee 3 (18<=age<60) : 20
Enter the salary of Employee 3 : 20000

                    EMPLOYEE DATA

Array No.       Name            Age             Salary
0               Shreya          19              30000
1               Shruti          20              25000
2               Kushal          20              20000

                SORTED EMPLOYEE DATA

Array No.       Name            Age             Salary
0               Shreya          19              30000
1               Kushal          20              20000
2               Shruti          20              25000
PS D:\PROJECT_AND_CODES\Java>
```

Test Case 4-

```
PS D:\PROJECT_AND_CODES\Java> cd "d:\PROJECT_AND_CODES\Java\" ; if ($?) { javac exp2.java } ; if ($?) { java exp2 }

Enter the number of Employees : 3
Enter the name of Employee 1 : Shreya
Enter the age of Employee 1 (18<=age<60) : 67
Invalid Age! (18<= Age <60)
Enter the age of Employee 1 (18<=age<60) : 20
Enter the salary of Employee 1 : 30000
Enter the name of Employee 2 : Shruti
Enter the age of Employee 2 (18<=age<60) : 20
Enter the salary of Employee 2 : 25000
Enter the name of Employee 3 : Kushal
Enter the age of Employee 3 (18<=age<60) : 20
Enter the salary of Employee 3 : 25000

                    EMPLOYEE DATA

Array No.       Name            Age             Salary
0               Shreya          20              30000
1               Shruti          20              25000
2               Kushal          20              25000

                SORTED EMPLOYEE DATA

Array No.       Name            Age             Salary
0               Kushal          20              25000
1               Shruti          20              25000
2               Shreya          20              30000
PS D:\PROJECT_AND_CODES\Java>
```