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❖ Department = BS Software Engineering (SE)

Paper = Object Oriented Programming

❖ Examination: Midterm Assignment

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Q1. What is Class and role of object in a Class, explain in detail with the help of a Suitable program?

Answer No 1: **Class:**

Collection of objects is called class. It is a logical entity.

A class can also be defined as a blueprint from which you can create an individual object. Class doesn't consume any space.

### **Object:**

Any entity that has state and behavior is known as an object. For example, a chair, pen, table, keyboard, bike, etc. It can be physical or logical.

An Object can be defined as an instance of a class. An object contains an address and takes up some space in memory. Objects can communicate without knowing the details of each other's data or code. The only necessary thing is the type of message accepted and the type of response returned by the objects.

### **Example:**

A dog is an object because it has states like color, name, breed, etc. as well as behaviors like wagging the tail, barking, eating, etc.

**Another Example is given below**

```

1 public class ClassObject {
2
3
4     public static void main(String[] arg) {
5
6         // this is main class and main method
7         System.out.println("I am Junaid and explaining the Class object role in java "
8
9         Student studentobject = new Student();
10        // here the studentobject is object.
11        // An object is an instance of a class.
12        // its means that studentobject have access to send and retrieve data from
13        // Student Class.
14        // Objects have states and behaviors
15
16        studentobject.getAge(); // its access the Student class Method by using object
17        studentobject.getMarks();
18        studentobject.getFatherName();
19        studentobject.getFees();
20
21        // above all the codes shows the realation of Class and Object which is best
22        // thing in Java language.
23
24    }
25
26    // this is class in java
27    // A class can be defined as a template/blueprint that describes the
28    // behavior/state that the object of its type support.
29    // its contains all the data where we can used according to our requirements.
30    static class Student {
31
32        public Student() {
33            // this is constructor of Student class when ever object is created it wil
34            // called.
35            // its empty constructor no arguments
36        }
37
38        void getMarks() {
39            // statements
40            System.out.println("Student Marks");
41        }
42
43        void getFees() {
44            // statements
45            System.out.println("Student Fees");
46        }
47
48        void getFatherName() {
49            // statements
50            System.out.println("Student Father Name");
51        }
52
53        void getAge() {
54            // statements
55            System.out.println("Student Age");
56        }
57
58    }
59
60
61
62

```

```

34        // called.
35        // its empty constructor no arguments
36    }
37
38    void getMarks() {
39        // statements
40        System.out.println("Student Marks");
41    }
42
43    void getFees() {
44        // statements
45        System.out.println("Student Fees");
46    }
47
48    void getFatherName() {
49        // statements
50        System.out.println("Student Father Name");
51    }
52
53    void getAge() {
54        // statements
55        System.out.println("Student Age");
56    }
57
58    }
59
60
61
62

```

Problems Javadoc Declaration Console

```

<terminated> ClassObject [Java Application] C:\Program Files\Java\jdk-13.0.2\bin\javaw.exe (
I am Junaid and explaining the Class object role in java
Student Age
Student Marks
Student Father Name
Student Fees

```

## **Explanation:**

First of all I mentioned the main class after this I wrote public static void main (String args[]) ,then I mentioned class name which is student and also I mentioned an object by the name of items like this student items=new student(); after these steps I wrote these all in order to display the result of items System.out.println("Student marks"+items.Student marks);

```
System.out.println("Student fees"+items.Student fees);
```

```
System.out.println("Student Father name"+items.Student Father name);
```

```
System.out.println("Student Age"+items. Student Age);
```

```
}
```

Then I mentioned second class and also I took some variables and I declared and initialized them like this class shop

```
{
```

```
I am Junaid and explaining the Class object role in java
```

```
Student Age
```

```
Student Marks
```

```
Student Father Name
```

```
Student Fees
```

**END**

Q2. Write a program about table printing which takes input from the user on the Basis of OOP and explain in detail.

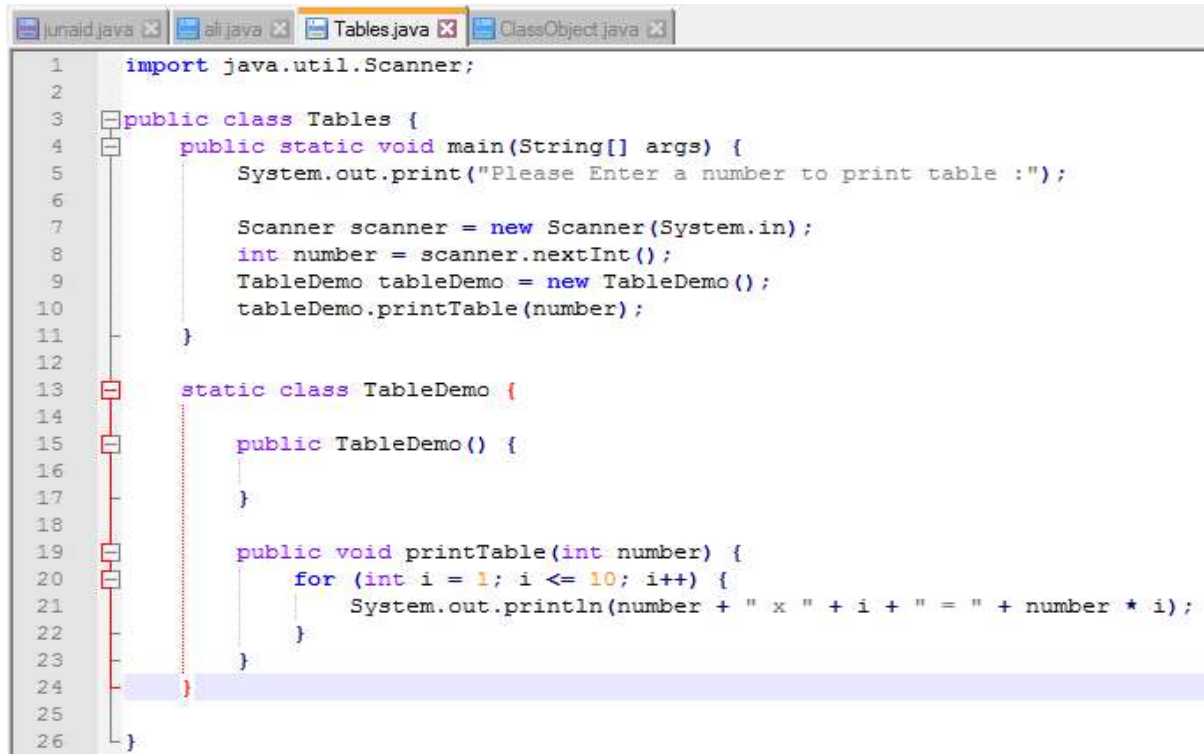
Answer No 2: I have done table printing program in ECLIPSE and also Notepad++.

```
Tables.java ☒
1 import java.util.Scanner;
2
3 public class Tables {
4     public static void main(String[] args) {
5         System.out.print("Please Enter a number to print table :");
6
7         Scanner scanner = new Scanner(System.in);
8         int number = scanner.nextInt();
9         TableDemo tableDemo = new TableDemo();
10        tableDemo.printTable(number);
11    }
12
13    static class TableDemo {
14
15        public TableDemo() {}
16
17    }
18
19    public void printTable(int number) {
20        for (int i = 1; i <= 10; i++) {
21            System.out.println(number + " x " + i + " = " + number * i);
22        }
23    }
24 }
25
26 }
```

```
Problems @ Javadoc Declaration Console ☒
<terminated> Tables [Java Application] C:\Program Files\Java\jdk-13.0.2\bin\javaw.exe (Apr 26, 2020, 5:41:20 PM)
Please Enter a number to print table :2
2 x 1 = 2
2 x 2 = 4
2 x 3 = 6
2 x 4 = 8
2 x 5 = 10
2 x 6 = 12
2 x 7 = 14
2 x 8 = 16
2 x 9 = 18
2 x 10 = 20
```

```
Problems @ Javadoc Declaration Console ☒
<terminated> Tables [Java Application] C:\Program Files\Java\jdk-13.0.2\bin\javaw.exe (Apr 26, 2020, 5:36:58 PM)
Please Enter a number to print table :723
723 x 1 = 723
723 x 2 = 1446
723 x 3 = 2169
723 x 4 = 2892
723 x 5 = 3615
723 x 6 = 4338
723 x 7 = 5061
723 x 8 = 5784
723 x 9 = 6507
723 x 10 = 7230
```

## This is also table program in Notepad++



```
1  import java.util.Scanner;
2
3  public class Tables {
4      public static void main(String[] args) {
5          System.out.print("Please Enter a number to print table :");
6
7          Scanner scanner = new Scanner(System.in);
8          int number = scanner.nextInt();
9          TableDemo tableDemo = new TableDemo();
10         tableDemo.printTable(number);
11     }
12
13     static class TableDemo {
14
15         public TableDemo() {
16
17         }
18
19         public void printTable(int number) {
20             for (int i = 1; i <= 10; i++) {
21                 System.out.println(number + " x " + i + " = " + number * i);
22             }
23         }
24     }
25
26 }
```



```
C:\Windows\system32\cmd.exe
C:\Users\Shah>cd Desktop
C:\Users\Shah\Desktop>javac Tables.java
C:\Users\Shah\Desktop>java Tables$TableDemo.class
Error: Could not find or load main class Tables$TableDemo.class
Caused by: java.lang.ClassNotFoundException: Tables$TableDemo.class
C:\Users\Shah\Desktop>java Tables
Please Enter a number to print table :2
2 x 1 = 2
2 x 2 = 4
2 x 3 = 6
2 x 4 = 8
2 x 5 = 10
2 x 6 = 12
2 x 7 = 14
2 x 8 = 16
2 x 9 = 18
2 x 10 = 20
C:\Users\Shah\Desktop>java Tables
Please Enter a number to print table :88
88 x 1 = 88
```

**EXPELNATION OF ABOVE PROGRAM:**

First of all I opened eclipse, then I went to file > new > Java project and I gave the name > finish. After this I clicked on file which I created then new > I clicked on class.

After above procedure, I started writing the program in order to print any table.

First I mentioned the main function which public static void main(String[] args) after this I mentioned data type and variable, then I took and an object by the name of table like this Scanner table=new Scanner(System.in);

Then I displayed a message to know what we should do just for understanding System.out.println("Enter any number="); at the end I used for loop to run table upto 10 like this number=tab.nextInt();

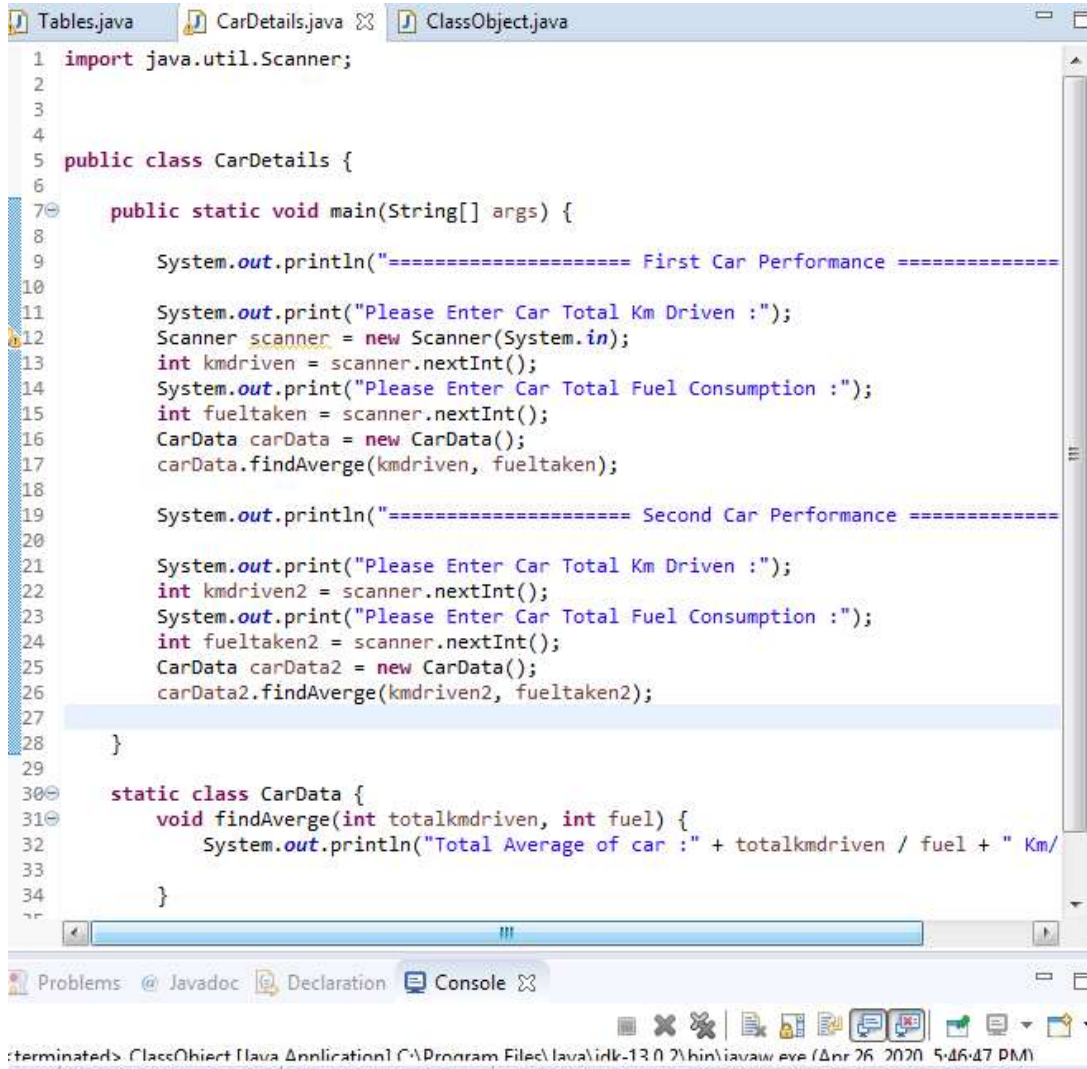
For (inti=0;i<=10;i++)

Finally I run the program and got correct result.

**END**

Q3. Write a program about any 2 cars which can calculate the performance of Both of them and explain in detail.

Answer No3:



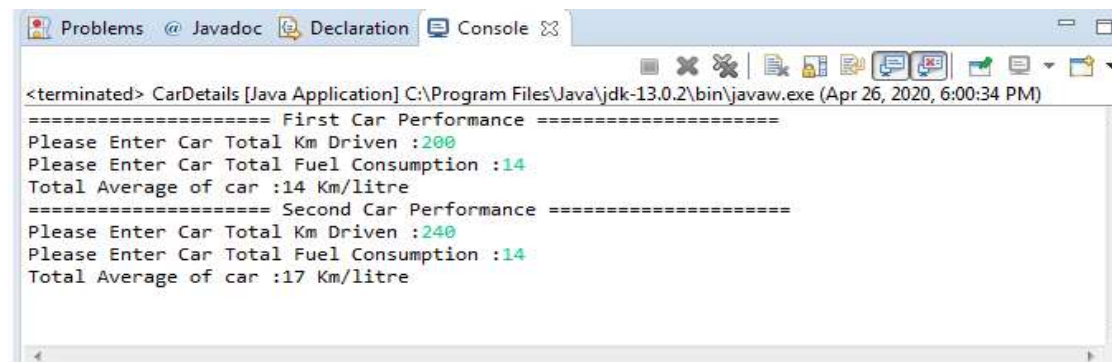
```

1 import java.util.Scanner;
2
3
4
5 public class CarDetails {
6
7
8     public static void main(String[] args) {
9
10        System.out.println("===== First Car Performance =====");
11
12        System.out.print("Please Enter Car Total Km Driven :");
13        Scanner scanner = new Scanner(System.in);
14        int kmDriven = scanner.nextInt();
15        System.out.print("Please Enter Car Total Fuel Consumption :");
16        int fuelTaken = scanner.nextInt();
17        CarData carData = new CarData();
18        carData.findAverage(kmDriven, fuelTaken);
19
20        System.out.println("===== Second Car Performance =====");
21
22        System.out.print("Please Enter Car Total Km Driven :");
23        int kmDriven2 = scanner.nextInt();
24        System.out.print("Please Enter Car Total Fuel Consumption :");
25        int fuelTaken2 = scanner.nextInt();
26        CarData carData2 = new CarData();
27        carData2.findAverage(kmDriven2, fuelTaken2);
28
29    }
30
31    static class CarData {
32        void findAverage(int totalKmDriven, int fuel) {
33            System.out.println("Total Average of car : " + totalKmDriven / fuel + " Km/");
34        }
35    }
36
37 }

```

Problems @ Javadoc Declaration Console

<terminated> ClassObject [Java Application] C:\Program Files\Java\jdk-13.0.2\bin\javaw.exe (Apr 26, 2020, 5:46:47 PM)



```

<terminated> CarDetails [Java Application] C:\Program Files\Java\jdk-13.0.2\bin\javaw.exe (Apr 26, 2020, 6:00:34 PM)
===== First Car Performance =====
Please Enter Car Total Km Driven :200
Please Enter Car Total Fuel Consumption :14
Total Average of car :14 Km/litre
===== Second Car Performance =====
Please Enter Car Total Km Driven :240
Please Enter Car Total Fuel Consumption :14
Total Average of car :17 Km/litre

```

## Explanation

First of all I opened eclipse, then I went to file > new > Java project and I gave the name > finish. After this I clicked on file which I created then new > I clicked on class .

In this program I created two classes one is main function class which name is Car Details and other is parent class which name is Scanner means car performance. I gave the names like Scanner and I took an object such as Honda and taxi like this

```
Scanner scanner = new Scanner(System.in);
carper scanner = new Scanner(System.in);
System.out.print("Please Enter Car Total Km Driven :");
```

```
Scanner scanner = new Scanner(System.in);
```

```
intkmdriven = scanner.nextInt();
```

```
System.out.print("Please Enter Car Total Fuel Consumption :");
```

```
intfueltaken = scanner.nextInt();
```

```
CarDatacarData = new CarData();
```

```
carData.findAverge(kmdriven, fueltaken);
```

```
System.out.println("===== Second Car Performance
=====");
```

```
System.out.print("Please Enter Car Total Km Driven :");
```

```
int kmdriven2 = scanner.nextInt();
```

```
System.out.print("Please Enter Car Total Fuel Consumption :");
```

```
int fueltaken2 = scanner.nextInt();
```

```
Scanner scanner = new Scanner(System.in);
```

```
carData2.findAverge(kmdriven2, fueltaken2);
```

```
}
```

```
static class CarData {
```

```
voidfindAverge(inttotalkmdriven, int fuel) {
```

```
System.out.println("Total Average of car : " + totalkmdriven / fuel + " Km/litre");
```

```
}
```

```
}
```

**I run my program and have gotten correct result:**

**END**