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Experiment No.3
Class and Objects
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**Aim :-** To use concept of class and object in java program.

**Objective :-** To use concept of class and object to solve a real life problem like reading student information and generating mark sheet.

**Theory:-** A class is a user defined blueprint or prototype from which objects are created. It represents the set of properties i.e. members and methods that are common to all objects of one type. In general, class declarations can include these components, in order:

1. Modifiers : A class can be public or has default access.
2. class keyword: class keyword is used to create a class.
3. Class name: The name should begin with a initial letter (capitalized by convention).
4. Superclass(if any): The name of the class's parent (superclass), if any, preceded by the keyword extends. A class can only extend (subclass) one parent.
5. Interfaces(if any): A comma-separated list of interfaces implemented by the class, if any, preceded by the keyword implements. A class can implement more than one interface.
6. Body: The class body surrounded by braces, { }.

A OBJECT is a basic unit of Object Oriented Programming and represents the real life entities. A typical Java program creates many objects, which interact by invoking methods. An object consists of :

1. State : It is represented by attributes of an object. It also reflects the properties of an object.
2. Behavior : It is represented by methods of an object. It also reflects the response of an object with other objects.
3. Identity : It gives a unique name to an object and enables one object to interact with other objects.

**Code :-**

1) Basics classes

```
class Rectangle{  
    int length,breadth;  
    void getdata(int x,int y) {  
        length=x;
```



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```
        breadth=y;
    }
    int area() {
        return length*breadth;
    }
}

class classandobjects{
    public static void main(String[] args) {
        int area1,area2;
        Rectangle rect1= new Rectangle();
        Rectangle rect2= new Rectangle();
        rect1.length=20;
        rect1.breadth=30;
        area1=rect1.length*rect1.breadth;
        System.out.println("Area of 1st Rectangle is "+area1);
        rect2.getdata(10, 20);
        area2=rect2.area();
        System.out.println("Area of 2nd Rectangle is "+area2);
    }
}
```

```
C:\Users\GAURAV\OneDrive\Documents>java classandobjects
Area of 1st Rectangle is 600
Area of 2nd Rectangle is 200
```

### 2) Hospital Management System

```
class patient {
    String pname, illness;
    int age, id;

    void getdata() {
```



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```
        System.out.println("Patient Name: " + pname);
        System.out.println("Disease Contracted : " + illness);
        System.out.println("Patient Age: " + age);
        System.out.println("Patient ID : " + id);

    }
}

class doctor {
    String name, Specialization;

    void getdocinfo() {
        System.out.println("Doctor Name: " + name);
        System.out.println(" Specialization : " + Specialization);
    }
}

class appointment {
    String time, date;

    void getappointment() {
        System.out.println("Time of Appointment: " + time);
        System.out.println("Date:" + date);
    }
}

class hospital {
    public static void main(String[] args) {
        patient p1 = new patient();
        appointment a1 = new appointment();
        doctor d1 = new doctor();

        // Entering patient info
        p1.age = 77;
        p1.pname = "Harish";
        p1.illness = "Dementia";
        p1.id = 234222;
        // entering doctor info
        d1.name = "Raj Kumar";
        d1.Specialization = "Neuro Surgeon";
        // entering appointment time
        a1.date = "21/08/54";
        a1.time = "11.00 AM";
```



```
// print info
pl.getdata();
a1.getappointment();
d1.getdocinfo();

}
}
```

```
PS G:\Programs\JAVA> & 'C:\Program Files\Java\jdk-2
iew' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp'
ing\Code\User\workspaceStorage\a31ef07c5754485dab625
\JAVA_e16f3d66\bin' 'hospital'
Patient Name: Harish
Disease Contracted :Dementia
Patient Age: 77
Patient ID : 234222
Time of Appointment: 11.00 AM
Date:21/08/54
Doctor Name: Raj Kumar
Specialization :Neuro Surgeon
PS G:\Programs\JAVA>
```

### Conclusion:-

In conclusion, classes and objects form the foundational principles of object-oriented programming in Java. They allow you to model real-world entities, organize code, achieve reusability, and create more maintainable software systems. By understanding and effectively using classes and objects, you can build sophisticated and powerful applications in Java.