



HYDERABAD INSTITUTE OF ARTS, SCIENCE, AND TECHNOLOGY

Object Oriented Programming lab-9

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Title:

Introduction to Classes and Objects

Objectives:

- To understand the concept of a class and an object in Java.
- To implement attributes and methods within a class.
- To demonstrate the creation and usage of objects.

Definitions:

Class: A class is a blueprint or template that defines the variables (attributes) and methods (functions) common to all objects of a certain kind.

Object: An object is an instance of a class that contains real values instead of variables.

Attributes: Variables defined inside a class which hold the data.

Methods: Functions defined inside a class which describe the behavior of an object.

Example Program 1: Library Book class

```
Book {  
    String title;  
    String author;    int  
    year;  
  
    void displayInfo() {  
        System.out.println("Title: " + title + ", Author: " + author + ", Year: " + year);  
    }  
}  
  
public class Lab9_Task1 {  
    public static void main(String[] args) {  
        Book b1 = new Book();  
    }  
}
```

```
b1.title = "Object Oriented Programming";  
b1.author = "James Smith";    b1.year =  
2021;
```

```
Book b2 = new Book();  
b2.title = "Data Structures";  
b2.author = "Mary Johnson";  
b2.year = 2019;
```

```
b1.displayInfo();  
b2.displayInfo();  
}}
```

Output:

Title: Object Oriented Programming, Author: James Smith, Year: 2021
Title: Data Structures, Author: Mary Johnson, Year: 2019

Example Program 2: Employee

```
class Employee {  
    String name;  
    int id;  
    double salary;  
  
    void displayInfo() {  
        System.out.println("Employee: " + name + " | ID: " + id + " | Salary: " + salary);  
    }  
  
    void raiseSalary(double percent) {  
        salary += salary * (percent / 100);  
        System.out.println("Updated Salary of " + name + ": " + salary);  
    }  
}  
  
public class Lab9_Task2 {  
    public static void main(String[] args) {  
        Employee e1 = new Employee();    e1.name  
        = "Ali Khan";  
        e1.id = 101;  
        e1.salary = 50000;  
  
        e1.displayInfo();  
        e1.raiseSalary(10);    }}
```

Output:

Employee: Ali Khan | ID: 101 | Salary: 50000.0

Updated Salary of Ali Khan : 55000.0

Lab Tasks

1. Create a Student class with attributes: name, rollNo, gpa.
 - Add a method checkProbation() that prints:
 - “On Probation” if GPA < 2.0
 - “Good Standing” otherwise.
2. Create a Course class with attributes: courseName, creditHours, instructor.
 - Write a method to display course details.

Discussion Questions:

- What is the difference between a class and an object?
- What is the purpose of attributes and methods in a class?
- Give three real-life examples that can be represented as classes.
- Why do we create objects instead of directly writing code in main()?
- Can one class be used to create multiple objects? Explain.