



**SCHOOL OF
COMPUTING**

LAB WORK

23CSE111 – Object Oriented Programming

Submitted by

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BACHELORS OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING

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JAVA PROGRAMS

1) To generate pay slips for calculating salary details of the employess working along with it displaying their details .

AIM : To develop a Java program that calculates the salary of employees based on the number of days worked and displays their details.

ALGORITHM:

1. Start.
2. Create a class salary with a method cal(int n) to calculate the salary.
3. Create a class details that extends salary and defines the method display(...) to show employee details.
4. In the main method:
 - Accept employee name, ID, designation, and number of days worked.
 - Compute the salary using cal(n).
 - Display all details using the display() method.
5. End

CODE :

```
import java.util.Scanner;

class salary{
int n; double sal;
double cal(int n){
sal = n*2500;
return sal;
}}
```

```
class details extends salary{
String na ; int eid; String d; int n;
void display(String na,int eid,String d,int n,double sal){
System.out.println("Name"+na);
System.out.println("Employee id:"+eid);
System.out.println("Designation:"+d);
System.out.println("Number of days worked:"+n);
System.out.println("SALARY:"+sal);
}}

public class j3{
public static void main(String[] args)
{
Scanner obj = new Scanner(System.in);
System.out.println("Enter your name");
String na = obj.nextLine();
System.out.println("Enter employee id");
int eid = obj.nextInt();
System.out.println("Enter designation");
obj.nextLine();
String d = obj.nextLine();
System.out.println("Enter Number of days worked:");
int n = obj.nextInt();
details de = new details();
double sal = de.cal(n);
```

```
de.display(na,eid,d,n,sal);  
obj.close();  
}  
}
```

OUTPUT:

```
C:\Users\chscu\OneDrive\Desktop\JAVA LAB (1)>javac j3.java  
C:\Users\chscu\OneDrive\Desktop\JAVA LAB (1)>java j3  
Enter your name  
Hasini Balabommu  
Enter employee id  
1006  
Enter designation  
Manger  
Enter Number of days worked:  
25  
NameHasini Balabommu  
Employee id:1006  
Designation:Manger  
Number of days worked:25  
SALARY:62500.0
```

- 2) To Write a Java program that demonstrates the use of classes and objects. This program defines a class called Person with attributes like name, age, and a method displayInfo() to display the information of a person.

AIM: To create a Java program that demonstrates the use of classes and objects using a Person class.

ALGORITHM :

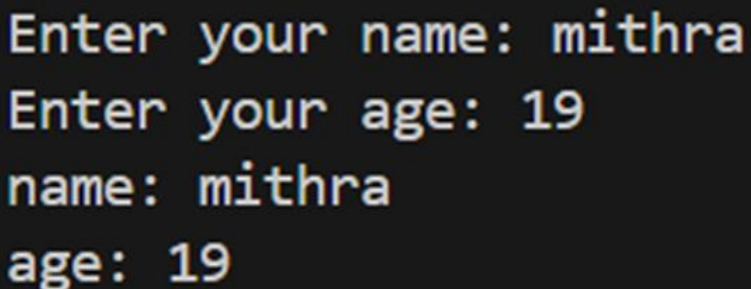
1. Start.
2. Define a class person with a method displayinfo(String name, int age).
3. In the main method:
 - Accept user input for name and age.
 - Create an object of person class.
 - Call displayinfo() to display user details.

4. End.

CODE :

```
import java.util.Scanner; class
person{
    void        displayinfo        (String        name,int
        age){    System.out.println("name:    "+name);
        System.out.println("age: "+age);
    }
}
public class human{
    public static void main(String []args){ Scanner
        scan=new Scanner(System.in);
        System.out.print("Enter your name: "); String
        name=scan.nextLine(); System.out.print("Enter
        your age: "); int age=scan.nextInt();
        person p=new person();
        p.displayinfo(name,age);
    }
}
```

OUTPUT:

A screenshot of a terminal window with a black background and white text. It shows the output of the Java program: 'Enter your name: mithra', 'Enter your age: 19', 'name: mithra', and 'age: 19'.

```
Enter your name: mithra
Enter your age: 19
name: mithra
age: 19
```

3) To solve single inheritance

AIM: To demonstrate single inheritance in Java using a vehicle class and a car subclass

ALGORITHM :

1. Start.
2. Define a parent class vehical with start() and stop() methods
3. Create a subclass car that extends vehical and adds a drive() method.
4. In the main method:
 Create an object of car.
 Call the start(), stop(), and drive() methods
5. End.

CODE:

```
class vehical{
    void start(){
        System.out.println("Start");
    }
    void stop(){
        System.out.println("Stop");
    }
}

class car extends vehical{
    void drive(){
        System.out.println("Start driving");
    }
}

public class j9{
```

```
public static void main(String[] args){  
    car c = new car();  
        c.stop();  
        c.start();  
        c.drive();  
    }  
}
```

OUTPUT:

```
C:\Users\chscu\OneDrive\Desktop\JAVA LAB (1)>javac j9.java  
C:\Users\chscu\OneDrive\Desktop\JAVA LAB (1)>java j9  
Stop  
Start  
Start driving
```

4)To create a base class shape and subclasses rectangle and circle and applying the methods such as calculating area and perimeter

AIM : To create a base class Shape and subclasses Rectangle and Circle, implementing methods to calculate area and perimeter.

ALGORITHM :

1. Start.
2. Create a class Shape with default methods for calculateArea() and calculatePerimeter().
3. Define a subclass Rectangle with length and width attributes:
 - Override methods to compute area and perimeter.
4. Define a subclass Circle with radius:

- Override methods for area and perimeter.

5. In main:

- Take user input for dimensions.
- Create objects of Rectangle and Circle.
- Display computed area and perimeter.

6. End.

CODE :

```
import java.util.Scanner;
class Shape {
double calculateArea() {
return 0;
}
double calculatePerimeter() {
return 0; } }
class Rectangle extends Shape {
double length, width;
Rectangle(double l, double w) {
length = l;
width = w;
}

double calculateArea() {
return length * width;
} double calculatePerimeter() {
return 2 * (length + width
)} }
class Circle extends Shape {
double radius; double pi = 3.14159;
Circle(double r) {
radius = r;
```



```

}

double calculateArea() {
    return pi * radius * radius;
}
double calculatePerimeter() {
    2 * pi * radius;
} }
class j4 {
    public static void main(String[] args) {
        Scanner obj = new Scanner(System.in);
        System.out.println("Enter the length");
        double l = obj.nextDouble();
        System.out.println("Enter breadth");
        double w = obj.nextDouble();
        System.out.println("Enter radius");
        double r = obj.nextDouble();
        Shape rect = new Rectangle(l,w);
        System.out.println("Rectangle Area: " + rect.calculateArea());
        System.out.println("Rectangle Perimeter: " + rect.calculatePerimeter());
        Shape circ = new Circle(r); System.out.println("\nCircle Area: " +
        circ.calculateArea()); System.out.println("Circle Perimeter: " +
        circ.calculatePerimeter());
    }
}

```

OUTPUT:

```
C:\Users\chscu\OneDrive\Desktop\JAVA LAB (1)>java j4
Enter the length
12
Enter breadth
10
Enter radius
7
Rectangle Area: 120.0
Rectangle Perimeter: 44.0

Circle Area: 153.93791
Circle Perimeter: 43.98226

C:\Users\chscu\OneDrive\Desktop\JAVA LAB (1)>|
```

5) To understand the basic concept of multilevel inheritance

AIM: To demonstrate multilevel inheritance using animal, mammal, and dog classes.

ALGORITHM:

1. Start.
2. Create a base class animal with method bark().
3. Create a subclass mammal extending animal, with method breathe().
4. Create another subclass dog extending mammal, with method eat().
5. In main:
 - Create an object of dog and call eat(), breathe(), and bark().
6. End.

CODE:

```
import java.util.Scanner;

class animal{
```

```
void bark(){
    System.out.println("dogs bark ");
}

class mammal extends animal{
    void breathe(){
        System.out.println("mammals breathe");
    }
}

class dog extends mammal{
    void eat(){
        System.out.println("dog eats bone");
    }
}

public class j5{
    public static void main(String[] args){
        dog d = new dog();
        d.eat();
        d.breathe();
        d.bark();
    }
}
```

OUTPUT:

```
C:\Users\chscu\OneDrive\Desktop\JAVA LAB (1)>javac j5.java
```

```
C:\Users\chscu\OneDrive\Desktop\JAVA LAB (1)>java j5  
dog eats bone  
mammals breathe  
dogs bark
```

6) AIM: To Calculate average of 3 numbers

ALGORITHM:

1. Start.
2. Accept three numbers from the user.
3. Compute the average using the formula:
$$\text{average} = \frac{\text{num1} + \text{num2} + \text{num3}}{3}$$
4. Display the result.
5. End.

CODE:

```
import java.util.Scanner; class  
average{  
    public static void main(String[] args) { Scanner scan =  
        new Scanner(System.in);  
        System.out.print("Enter the first number: "); int num1 =  
        scan.nextInt(); System.out.print("Enter the second number:  
        "); int num2 = scan.nextInt(); System.out.print("Enter the  
        third number: "); int num3 = scan.nextInt();  
        double average = (num1 + num2 + num3) / 3; System.out.println("The  
        average of the three numbers is: " +  
        average);  
        scan.close();  
    }  
}
```

OUTPUT:

```
Enter the first number: 34
Enter the second number: 45
Enter the third number: 23
The average of the three numbers is: 34.0
```

7) To generate a JAVA code to find out the result and grade of the students using loops

AIM: To determine a student's grade based on marks using conditional statements.

ALGORITHM:

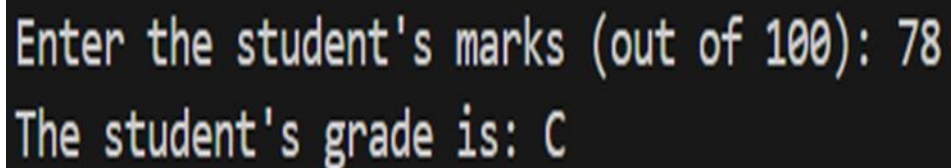
1. Start.
2. Accept the marks (out of 100) from the user.
3. Use if-else conditions:
 - 90–100 → Grade A
 - 80–89 → Grade B
 - 70–79 → Grade C
 - 60–69 → Grade D
 - 50–59 → Grade E
 - Below 50 → Grade F
4. Display the grade.
5. End.

CODE:

```
import java.util.Scanner; class grade{
public static void main(String[] args) { Scanner scan = new
Scanner(System.in);
System.out.print("Enter the student's marks (out of 100): ");
int marks = scan.nextInt(); char grade=' ';
```

```
if (marks >= 90 && marks <= 100) { grade = 'A';  
  } else if (marks >= 80) { grade = 'B';  
  } else if (marks >= 70) { grade = 'C';  
  } else if (marks >= 60) { grade = 'D';  
  } else if (marks >= 50) { grade = 'E';  
  } else if (marks >= 0) { grade = 'F';  
  }  
  else {  
    System.out.println("Invalid input");  
  }  
  System.out.println("The student's grade is: " + grade); scan.close(); }  
}
```

OUTPUT :



Enter the student's marks (out of 100): 78
The student's grade is: C

8) To generate a java code to categorize people based on their age

AIM: To categorize a person as Child, Teenager, Adult, or Senior Citizen based on their age.

ALGORITHM :

1. Start.
2. Accept age as input.
3. Use if-else conditions to categorize:
 - 0–12 → Child
 - 13–19 → Teenager
 - 20–59 → Adult
 - 60+ → Senior Citizen

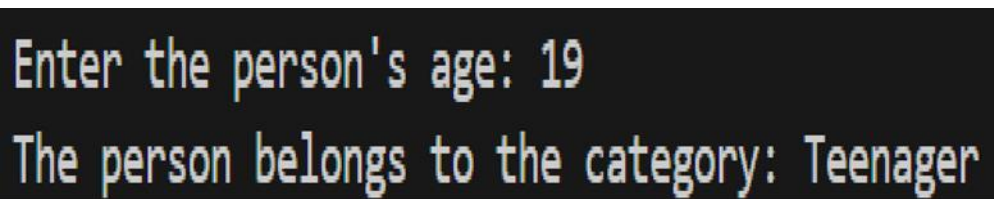
4. Display the category.
5. End.

CODE:

```
import java.util.Scanner; class category{
    public static void main(String[] args) { Scanner scan = new
        Scanner(System.in);
        System.out.print("Enter the person's age: "); int age = scan.nextInt();
        String category; if (age < 0) {
            category = "Invalid age entered.";

        } else if (age <= 12) { category = "Child";
        } else if (age <= 19) { category = "Teenager";
        } else if (age <= 59) { category = "Adult";
        } else {
            category = "Senior Citizen";
        }
        System.out.println("The person belongs to the category: " + category);
        scan.close();
    }
}
```

OUTPUT:

A screenshot of a terminal window with a black background and light blue/green text. It shows the program's output for an input age of 19. The first line is "Enter the person's age: 19" and the second line is "The person belongs to the category: Teenager".

```
Enter the person's age: 19
The person belongs to the category: Teenager
```

9)

AIM : To generate Java program to calculate electricity bill

ALGORITHM:

1. Start.
2. Accept the number of units consumed.
3. Compute the bill using conditions:
 - Up to 100 units → ₹1.50 per unit.
 - 101–300 units → ₹2.00 per unit (extra for units above 100).
 - Above 300 units → ₹3.00 per unit (extra for units above 300).
4. Add a fixed service charge of ₹50.
5. Display the total bill amount.
6. End.

CODE:

```
import java.util.Scanner;
class bill{
    public static void main(String[] args) { Scanner scan = new
        Scanner(System.in);
        System.out.print("Enter the number of units consumed: ");
        double units = scan.nextDouble(); double billAmount;
        if (units <= 100) { billAmount = units *
            1.50;
        } else if (units <= 300) {
            billAmount = (100 * 1.50) + ((units - 100) * 2.00);
        } else {
            billAmount = (100 * 1.50) + (200 * 2.00) + ((units -
300) * 3.00);
        }
        double serviceCharge = 50.00; billAmount +=
        serviceCharge;
        System.out.println("Total Bill Amount: Rs. " + billAmount);
        scan.close();
    }
```



```
}
```

OUTPUT :

```
Enter the number of units consumed: 345
Total Bill Amount: Rs. 735.0
```

10)

AIM : To generate a program to print area of triangle

ALGORITHM:

1. Start.
2. Accept base and height values.
3. Compute the area using the formula: $\text{Area} = 1/2 \times \text{base} \times \text{height}$
4. Display the result.
5. End.

CODE :

```
import java.util.Scanner;
class Triangle{
    public static void main(String[] args) { Scanner scan = new
        Scanner(System.in);
        System.out.print("Enter the base of the triangle: "); double base =
        scan.nextDouble(); System.out.print("Enter the height of the triangle: ");
        double height = scan.nextDouble();
        double area = 0.5 * base * height; System.out.println("The area of the
        triangle is: " +
        area);
        scan.close();
    }
```

```
}  
}
```

OUTPUT:

```
Enter the base of the triangle: 3  
Enter the height of the triangle: 2.5  
The area of the triangle is: 3.75
```