**Lab -4**

**23BCE7416**

**1)Write a java programs to implement single inheritance where the parent class defines a method calculate().and the child class overrides it to performa a specifie mathematical operation.**

class Calculate {

void calculate(int a, int b) {

System.out.println("Calculation not in base class");

}

}

class Add extends Calculate {

@Override

void calculate(int a, int b) {

int c = a + b;

System.out.println("Addition: " + c);

}

}

public class Main {

public static void main(String[] args) {

Add a = new Add();

a.calculate(12, 90);

}

}

**Addition: 102**

**2)Write a Java program to create a Calculator class with overloaded methods named calculate() that perform:**

**. Addition of two mumbers**

**Subtraction of two mambers**

**Multiplication of two numbers**

**Division of two numbers.**

public class Calculator {

public double calculate(double a, double b) {

return a + b;

}

public double calculate(double a, double b, String operation) {

switch (operation.toLowerCase()) {

case "subtract":

return a - b;

case "multiply":

return a \* b;

case "divide":

if (b != 0) {

return a / b;

} else {

throw new ArithmeticException("Division by zero is not allowed.");

}

default:

throw new IllegalArgumentException("Invalid operation: " + operation);

}

}

public static void main(String[] args) {

Calculator calc = new Calculator();

double a = 10;

double b = 5;

System.out.println("Addition: " + calc.calculate(a, b));

System.out.println("Subtraction: " + calc.calculate(a, b, "subtract"));

System.out.println("Multiplication: " + calc.calculate(a, b, "multiply"));

System.out.println("Division: " + calc.calculate(a, b, "divide"));

}

}

**Addition: 15.0**

**Subtraction: 5.0**

**Multiplication: 50.0**

**Division: 2.0.**

**3)Write a Java program with a Calculator class having multiple constructors:**

**One that takes no arguments and sets values to 0**

**One that takes two arguments and performs addition immediately**

**One that takes these argest two suchers and a string for the operation to performs.**

public class Calculator {

double num1, num2, result;

Calculator() {

num1 = 0;

num2 = 0;

result = 0;

System.out.println("No-arg constructor: result = " + result);

}

Calculator(double a, double b) {

num1 = a;

num2 = b;

result = a + b;

System.out.println("Addition: " + a + " + " + b + " = " + result);

}

Calculator(double a, double b, String op) {

num1 = a;

num2 = b;

if (op.equals("+"))

result = a + b;

else if (op.equals("-"))

result = a - b;

else if (op.equals("\*"))

result = a \* b;

else if (op.equals("/")) {

if (b != 0)

result = a / b;

else {

System.out.println("Cannot divide by zero");

result = 0;

}

} else {

System.out.println("Unknown operation");

result = 0;

}

System.out.println("Operation: " + a + " " + op + " " + b + " = " + result);

}

public static void main(String[] args) {

Calculator c1 = new Calculator();

Calculator c2 = new Calculator(10, 5);

Calculator c3 = new Calculator(20, 4, "\*");

Calculator c4 = new Calculator(10, 0, "/");

}

}

**No-arg constructor: result = 0.0**

**Addition: 10.0 + 5.0 = 15.0**

**Operation: 20.0 \* 4.0 = 80.0**

**Cannot divide by zero**

**Operation: 10.0 / 0.0 = 0.0**