```java
import java.util.*;
abstract class Shape {
public abstract double calculateArea();
}
class Circle extends Shape {
private double radius;
public Circle(double radius) {
this.radius = radius;
}
@Override
public double calculateArea() {
return 3.14 * radius * radius;
}
}
class Rectangle extends Shape {
private double length, width;
public Rectangle(double length, double width) {
this.length = length;
this.width = width;
}
@Override
public double calculateArea() {
return length * width;
}
}
class Square extends Shape {
private double side;
public Square(double side) {
this.side = side;
}
@Override
public double calculateArea() {
return side * side;
}
}
public class Inheritance {
public static void main(String[] args) {
Shape circle = new Circle(2);
Shape rectangle = new Rectangle(4, 6);
Shape square = new Square(4);
System.out.println(&quot;Circle Area: &quot; + circle.calculateArea());
System.out.println(&quot;Rectangle Area: &quot; + rectangle.calculateArea());
System.out.println(&quot;Square Area: &quot; + square.calculateArea());}
}
```

```
--- Output - Run (Inheritence) |t-cli) @ Inheritence ---
Circle Area:12.56
Rectangle Area:24.0
Square Area:16.0
-----------------------------------------------------------------
BUILD SUCCESS
-----------------------------------------------------------------
Total time:  1.602 s
Finished at: 2025-12-11T13:36:39+05:30
-----------------------------------------------------------------
```

```java
import java.util.Scanner;
class Student{
    String name;
    int mark1,mark2,mark3;
    void displayDetails(){
        double average =(mark1+mark2+mark3)/3.0;
        char grade = average>=90?'A':average>=80 ? 'B' : average >= 70 ? 'C' : average >=60 ?
'D' : 'F';
        System.out.println("Name: " + name + ", Average: " + average + ", Grade: " + grade);
    }
}
public class StudentDetails {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        Student student = new Student();
        System.out.print("Enter name: ");
        student.name = scanner.nextLine();
        System.out.print("Enter 3 marks: ");
        student.mark1 = scanner.nextInt();
        student.mark2 = scanner.nextInt();
        student.mark3 = scanner.nextInt();
        student.displayDetails();
        scanner.close();
    }
}
```

```
--- exec:3.5.1:exec (default-cli) @ StudentDetails ---
Enter name: kani
Enter 3 marks: 90
80
89
Name: kani, Average: 86.333333333333, Grade: B
------------------------------------------------------------------
BUILD SUCCESS
```

```java
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the first string: ");
        String str1 = scanner.nextLine();
        System.out.print("Enter the second string: ");
        String str2 = scanner.nextLine();

        System.out.println("\nChoose a string operation:");
        System.out.println("1. Find Length");
        System.out.println("2. Convert to Uppercase");
        System.out.println("3. Convert to Lowercase");
        System.out.println("4. Concatenate Strings");
        System.out.println("5. Check if Substring Exists");
        System.out.println("6. Check if String is Empty");
        System.out.println("7. Exit");

        while(true) {
            System.out.print("\nEnter your choice: ");
            int choice = scanner.nextInt();
            scanner.nextLine();

            switch (choice) {
                case 1:
                    System.out.println("1. Length of first string: " + str1.length());
                    System.out.println("1. Length of second string: " + str2.length());
                    break;
                case 2:
```

```java
                System.out.println("2. First string in uppercase: " + str1.toUpperCase());
                System.out.println("2. Second string in uppercase: " + str2.toUpperCase());
                break;
            case 3:
                System.out.println("3. First string in lowercase: " + str1.toLowerCase());
                System.out.println("3. Second string in lowercase: " + str2.toLowerCase());
                break;
            case 4:
                System.out.println("4. Concatenated string: " + str1.concat(str2));
                break;
            case 5:
                System.out.print("5. Enter a substring to check in the first string: ");
                String substring = scanner.nextLine();
                if (str1.contains(substring)) {
                    System.out.println("5. Substring exists in the first string.");
                } else {
                    System.out.println("5. Substring does not exist in the first string.");
                }
                break;
            case 6:
                System.out.println("6. Is the first string empty? " + str1.isEmpty());
                System.out.println("6. Is the second string empty? " + str2.isEmpty());
                break;
            case 7:
                System.out.println("7. Exiting the program !");
                break;
            default:
                System.out.println("Invalid choice. Please try again.");
                return;
        }

    }
}

}
```

Run (Mains) ×   Run (Mains) ×

--- exec:3.5.1:exec (default-cli) @ Mains ---
Enter the first string: world
Enter the second string: wide

Choose a string operation:
1. Find Length
2. Convert to Uppercase
3. Convert to Lowercase
4. Concatenate Strings
5. Check if Substring Exists
6. Check if String is Empty
7. Exit

Enter your choice: 1
1. Length of first string: 5
1. Length of second string: 4

Enter your choice: 2
2. First string in uppercase: WORLD
2. Second string in uppercase: WIDE

Enter your choice: 3
3. First string in lowercase: world
3. Second string in lowercase: wide

Enter your choice: 4
4. Concatenated string: worldwide

Enter your choice: 5
5. Enter a substring to check in the first string: world
5. Substring exists in the first string.

Enter your choice: 6
6. Is the first string empty? false
6. Is the second string empty? false

Enter your choice: 7
7. Exiting the program !

Enter your choice: 8
Invalid choice. Please try again.

BUILD SUCCESS