

PROGRAMS OF JAVA

PROGRAM 1

```
import java.util.*;
class Prg1{
public static void main(String args[]){
Scanner sc = new Scanner(System.in);
final double Pi = 22/7;
System.out.println("Enter the length and acceleration due to gravity");
int l = sc.nextInt();
int g = sc.nextInt();
double t = 2*Pi*Math.sqrt(l/g);
System.out.println("The time period of the pendulum is"+t);
}
}
```

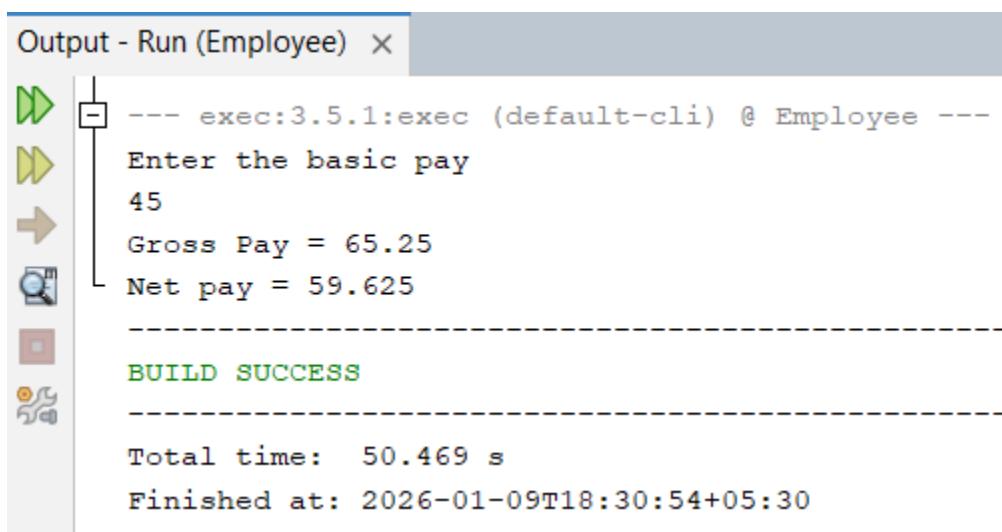
OUTPUT

```
Output - Run (prg1) ×
Enter the length and acceleration due to gravity
23
45
The time period of the pendulum is0.0
-----
BUILD SUCCESS
-----
Total time: 01:10 min
Finished at: 2026-01-09T18:20:39+05:30
-----
```

PROGRAM 2

```
import java.util.*;
class Employee{
public static void main(String args[]){
Scanner sc = new Scanner(System.in);
System.out.println("Enter the basic pay");
int pay = sc.nextInt();
double da = 0.3 * pay;
double hra = 0.15 * pay;
double pf = 0.125 * pay;
double gross = pay + da + hra;
double net = gross - pf;
System.out.println("Gross Pay = "+gross);
System.out.println("Net pay = "+net); }
}
```

OUTPUT



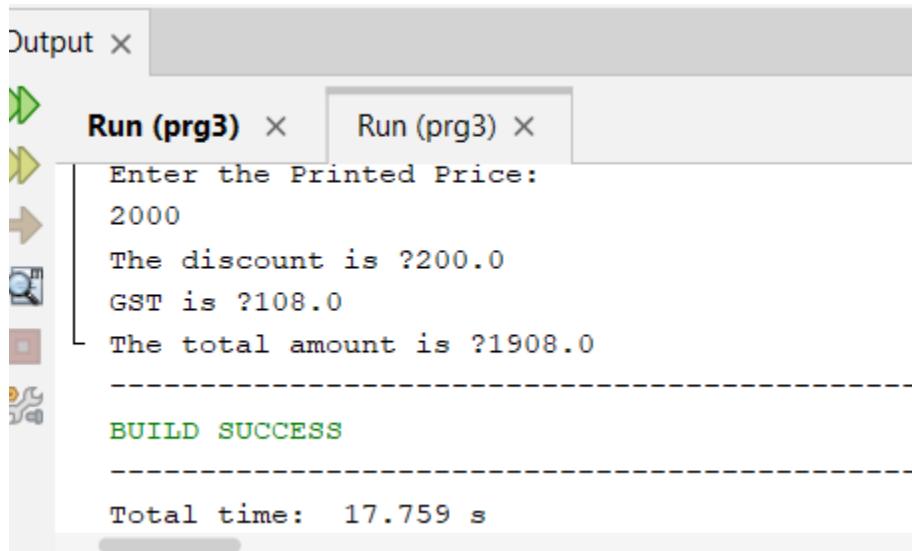
```
Output - Run (Employee) ×
--- exec:3.5.1:exec (default-cli) @ Employee ---
Enter the basic pay
45
Gross Pay = 65.25
Net pay = 59.625
-----
BUILD SUCCESS
-----
Total time: 50.469 s
Finished at: 2026-01-09T18:30:54+05:30
```

PROGRAM 3

```
import java.util.*;
class Prg3{
public static void main(String args[]){
Scanner sc = new Scanner(System.in);
System.out.println("Enter the Printed Price:");
int p= sc.nextInt();
double d = 0.1 * p;
double dp = p - d;
double gst = 0.06 * dp;
```

```
        double amount = dp + gst;
        System.out.println("The discount is "+d +"GST is "+gst);
        System.out.println("The total amount is "+amount);
    }
}
```

OUTPUT



```
Output x
Run (prg3) x Run (prg3) x
Enter the Printed Price:
2000
The discount is ?200.0
GST is ?108.0
The total amount is ?1908.0
-----
BUILD SUCCESS
-----
Total time: 17.759 s
```

PROGRAM 4

```
import java.util.*;
class Prg4{
    public static void main(String args[]){
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the Cost Price.");
        int price = sc.nextInt();
        double dis1 = 0.3 * price;
        double price2 = price - dis1;
        System.out.println ("Price after 30% discount is "+price2);
        double dis2 = 0.2 * price;
        double price3 = price - dis2;
        double dis3 = 0.1 * price3;
        double price4 = price3 - dis3;
        System.out.println("Price after successive discounts is "+price4);
    }
}
```

OUTPUT

```
Output ×
Run (prg3) × Run (prg4) ×
--- exec:3.5.1:exec (default-cli) @ prg4 ---
Enter the Cost Price.
34
Price after 30% discount is 23.8
Price after successive discounts is 24.48
-----
BUILD SUCCESS
-----
```

PROGRAM 5

```
import java.util.*;
class Prg5{
public static void main(String args[]){
Scanner sc = new Scanner(System.in);
System.out.println("Enter the sum of money");
double sum = sc.nextInt();
double in1 = sum * 5* 1/100.0;
System.out.println("Interest for the first year is "+in1); sum
+= in1;
double in2 = sum * 5 * 1 / 100.0;
System.out.println("Interest after second year is "+in2); sum
+= in2;
double in3 = sum * 5 * 1 /100.0;
sum += in3;
System.out.println("Amount after three years is "+sum);
}
}
```

OUTPUT

```
Output ×
Run (prg3) × Run (prg5) ×
--- exec:3.5.1:exec (default-cli) @ prg5 ---
Enter the sum of money
23
Interst for the first year is ?1.15
Interst after second year is ?1.2075
Amount after three years is ?26.625375
-----
BUILD SUCCESS
```

PROGRAM 6

```
class Prg6{
public static void main(String args[]){
int num = (2000 * 100)/(10 * 10);
System.out.println("Number of shares currently held is "+num); int
want = 3000 - num;
System.out.println("No. of Shares needed to reach 3000 is "+want);
}
}
```

OUTPUT

```
Run (prg3) × Run (prg6) ×
--- exec:3.5.1:exec (default-cli) @ prg6 --
Number of shares currently held is 2000
No. of Shares needed to reach 3000 is 1000
-----
BUILD SUCCESS
-----
Total time: 0.955 s
Finished at: 2026-01-09T18:54:27+05:30
```

PROGRAM 7

```
import java.util.*;
class Prg7{
```

```

public static void main(String args[]){
Scanner sc = new Scanner(System.in);
System.out.println("Enter time in seconds");
int sec = sc.nextInt();
int hour = sec/3600;
sec = sec % 3600;
int min = sec / 60;
sec = sec % 60;
System.out.println(hour+"Hours"+min+" Minutes "+sec+"Seconds");
}
}

```

OUTPUT

```

Output - Run (prg7) ×

Enter time in seconds
34
0Hours0 Minutes 34Seconds
-----
BUILD SUCCESS
-----
Total time: 24.771 s
Finished at: 2026-01-09T19:13:37+05:30
-----
```

PROGRAM 8

```

import java.util.*;
class Prg9{
public static void main(String args[]){
Scanner sc = new Scanner(System.in);
System.out.println("Enter the sum of money invested");
int sum = sc.nextInt();
double si = sum * 10 * 3 / 100.0;
double amount =sum*Math.pow(1+(10/100.0),3);
double ci = amount - sum;
double dif = ci - si;
System.out.println("Simple Interest : "+si);
System.out.println("Compound Interest : "+ci);
System.out.println("Difference between CI and SI : "+dif);
}
}
```

}

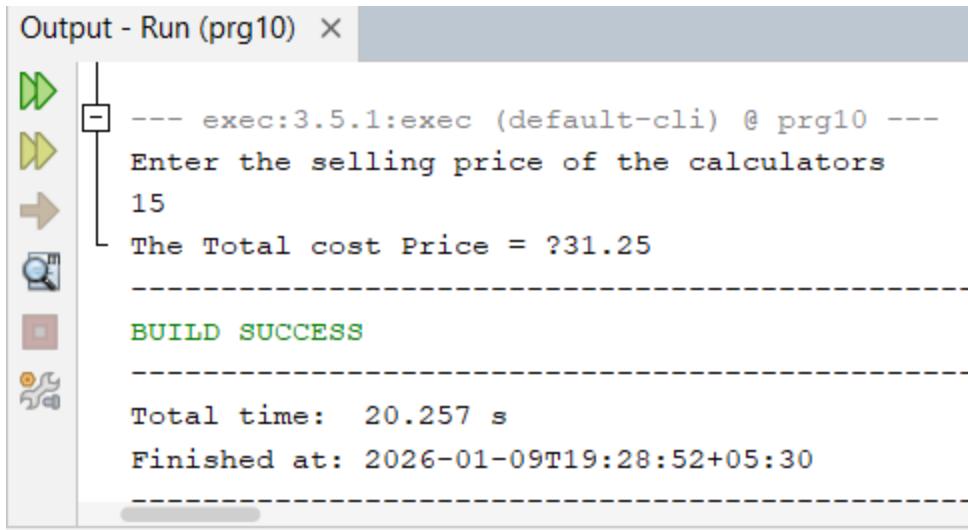
OUTPUT

```
Output - Run (prg9) ×
C:\Users\DELL\Desktop\Java\prg9>
Enter the sum of money invested
56
Simple Interest : ?16.8
Compound Interest : ?18.536000000000003
Differnce between CI and SI : ?1.7360000000000029
-----
BUILD SUCCESS
-----
Total time: 5.278 s
Finished at: 2026-01-09T19:26:01+05:30
```

PROGRAM 9

```
import java.util.*;
class Prg10{
public static void main(String args[]){
Scanner sc = new Scanner(System.in);
System.out.println("Enter the selling price of the calculators");
double sp = sc.nextDouble();
double cpProfit = sp/(1 + 20/100.0);
double cpLoss = sp/(1 - 20/100.0);
double total = cpProfit + cpLoss;
System.out.println("The Total cost Price = \u20B9"+total);
}
}
```

OUTPUT



```
Output - Run (prg10) X
--- exec:3.5.1:exec (default-cli) @ prg10 ---
Enter the selling price of the calculators
15
The Total cost Price = ?31.25
-----
BUILD SUCCESS
-----
Total time: 20.257 s
Finished at: 2026-01-09T19:28:52+05:30
-----
```

PROGRAM 10

```
import java.util.*;
class Prg11{
public static void main(String args[]){
Scanner sc = new Scanner(System.in);
System.out.println("Enter three angle of a triangle");
int a= sc.nextInt();
int b= sc.nextInt();
int c = sc.nextInt();
int total = a+b+c;
if(total == 180){
if (a<90&&b<90&&c<90) {
System.out.println("Acute-angled Triangle");
}
else if (a == 90 || b == 90 || c == 90) {
System.out.println("Right-angled Triangle");
}
else {
System.out.println("Obtuse-angled Triangle");
}
}else{
System.out.println("Triangle not possible");
}
}
}
```

OUTPUT

```
Output - Run (prg11) X
--- exec:3.5.1:exec (derault-cli) @ prg11 ---
Enter three angle of a triangle
23
13
12
Triangle not possible
-----
BUILD SUCCESS
-----
Total time: 11.764 s
Finished at: 2026-01-09T19:34:30+05:30
```

Run (prg3)

(1)

34:2/24:

PROGRAM 11

```
import java.util.*;
class Prg12{
public static void main(String args[]){
Scanner sc = new Scanner(System.in);
System.out.println("Enter the cost price");
double cp = sc.nextInt();
System.out.println("Enter the selling price");
double sp = sc.nextInt();
if(sp>cp){
double profit = sp - cp;
double profitp = profit / cp * 100.0;
System.out.println("Profit is "+profit+"\nProfit percent is "+profitp);
}else
if(cp>sp){
double loss = cp - sp;
double lossp = loss / cp * 100.0;
System.out.println("Loss is "+loss+"\nLoss percent is "+lossp);
}else{
System.out.println("Neither profit nor loss");
}
}
}
```

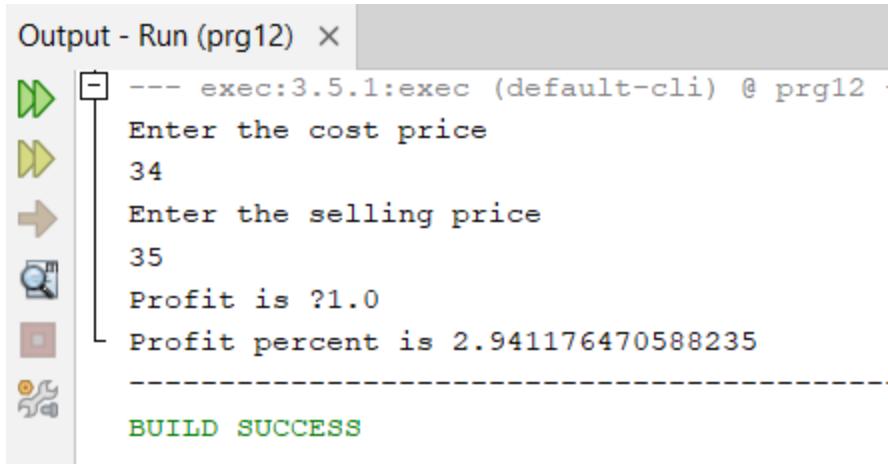
OUTPUT

```
Output - Run (prg12) X
--- exec:3.5.1:exec (default-cli) @ prg12 ---
Enter the cost price
34
Enter the selling price
35
Profit is ?1.0
Profit percent is 2.941176470588235
-----
BUILD SUCCESS
```

PROGRAM 12

```
import java.util.*;
class Prg13{
public static void main(String args[]){
Scanner sc = new Scanner(System.in);
System.out.println("Enter three numbers");
int a= sc.nextInt();
int b = sc.nextInt();
int c = sc.nextInt();
if(a == b && b == c){
System.out.println("All the numbers are equal");
}else{
int d = Math.max(Math.max(a,b),c);
System.out.println("Greatest number is "+d);
}
}
}
```

OUTPUT

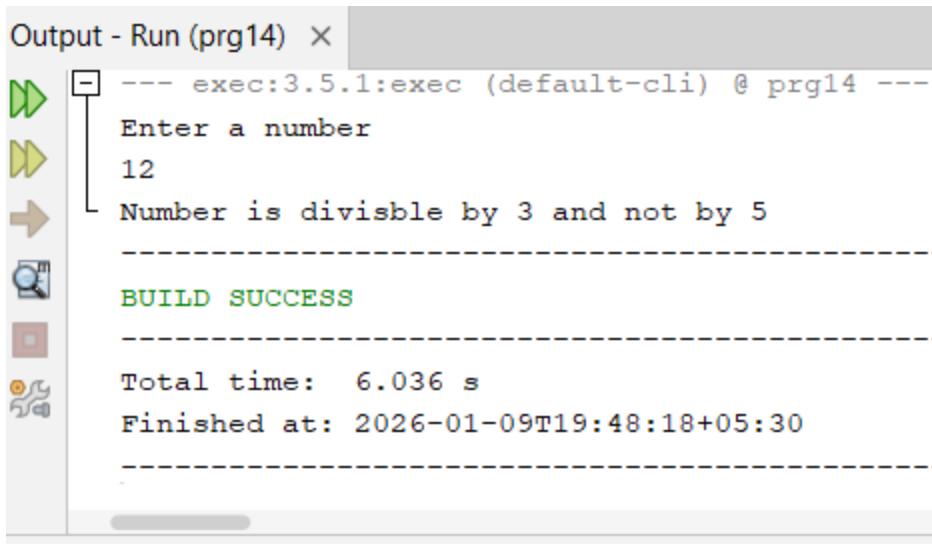


```
Output - Run (prg12) X
--- exec:3.5.1:exec (default-cli) @ prg12
Enter the cost price
34
Enter the selling price
35
Profit is ?1.0
Profit percent is 2.941176470588235
-----
BUILD SUCCESS
```

PROGRAM 13

```
import java.util.*;
class Prg14{
public static void main(String args[]){
Scanner sc = new Scanner(System.in);
System.out.println("Enter a number");
int num = sc.nextInt();
if(num % 3 == 0 && num % 5 == 0){
System.out.println("Number is divisible by both 3 and 5");
}else
if(num % 3 == 0&&num % 5 != 0 ){
System.out.println("Number is divisible by 3 and not by 5");
}else
if(num % 3 != 0&&num % 5 == 0 ){
System.out.println("Number is divisible by 5 and not by 3");
}else{
System.out.println("The number is neither divisible by 5 nor by 3");
}
}
}
```

OUTPUT



```
Output - Run (prg14) ×
--- exec:3.5.1:exec (default-cli) @ prg14 ---
Enter a number
12
Number is divisible by 3 and not by 5
-----
BUILD SUCCESS
-----
Total time: 6.036 s
Finished at: 2026-01-09T19:48:18+05:30
-----
```

PROGRAM 14

```
import java.util.*;
class Prg15{
public static void main(String args[]){
Scanner sc = new Scanner(System.in);
System.out.println("Enter a year");
int year = sc.nextInt();
if(year % 4 == 0&&year %100 != 0){
System.out.println("The year is a leap year");
}else if(year % 4 == 0&&year %100 == 0){
System.out.println("The year is a Century leap year");
}else if(year % 4 !=0 && year %100 == 0){
System.out.println("The year is a Century year");
}else{
System.out.println("The year is neither a Century year nor a Leap year.");
}
}
}
```

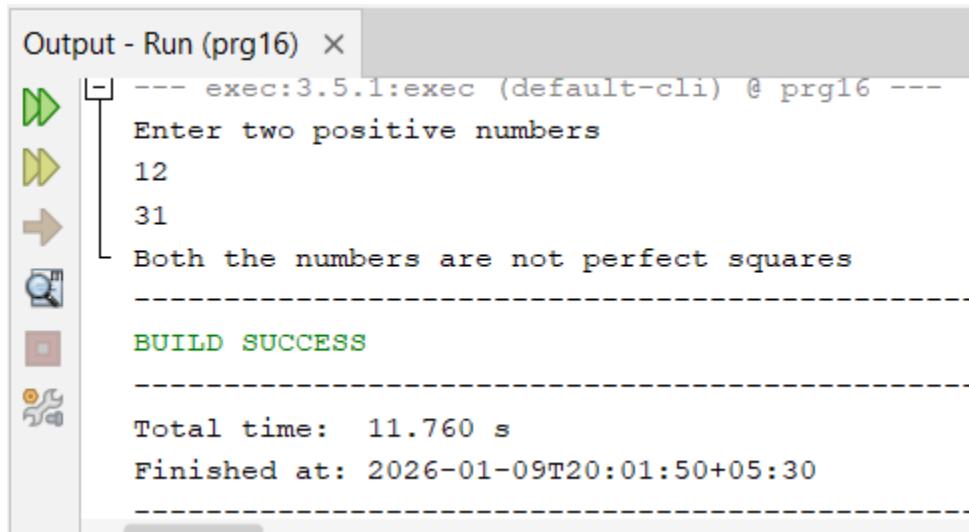
OUTPUT

```
Output - Run (prg15) ×
--- exec:3.5.1:exec (default-cli) @ prg15 ---
Enter a year
2007
The year is neither a Century year nor a Leap year.
-----
BUILD SUCCESS
-----
Total time: 10.873 s
Finished at: 2026-01-09T19:54:21+05:30
-----
```

PROGRAM 15

```
import java.util.*;
class Prg16{
public static void main(String args[]){
Scanner sc = new Scanner(System.in);
System.out.println("Enter two positive numbers");
int a= sc.nextInt();
int b = sc.nextInt();
if(a<0 || b<0){
System.out.println("Square root of negative numbers cannot be determined");
}else{
double sqrtA = Math.sqrt(a);
double sqrtB = Math.sqrt(b);
double c = sqrtA - Math.floor(sqrtA);
double d = sqrtB - Math.floor(sqrtB);
if(c== 0&&d ==0){
System.out.println("The numbers are perfect squares");
}else if(c == 0 && d != 0 ){
System.out.println(a+" is a Perfect Square"+ "\n" +b+" is not a Perfect Square");
}else if(c != 0&&d == 0 ){
System.out.println(a+" is not a Perfect Square"+ "\n" +b+" is a Perfect Square");
}else if(c != 0 && d != 0 ){
System.out.println("Both the numbers are not perfect squares ");
}
}
}
}
```

OUTPUT



```
Output - Run (prg16) ×
--- exec:3.5.1:exec (default-cli) @ prg16 ---
Enter two positive numbers
12
31
Both the numbers are not perfect squares
-----
BUILD SUCCESS
-----
Total time: 11.760 s
Finished at: 2026-01-09T20:01:50+05:30
-----
```

PROGRAM 16

```
import java.util.Scanner;
public class Average {
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:
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(" 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;
}
}
}
}
```

OUTPUT

```
Output × Run (MARK) × Run (MARK) ×
Compiling 1 source file with java -target release-20 -no-target-class
--- exec:3.5.1:exec (default-cli) @ MARK ---
Enter the first string:BoomiKa
Enter the second string:Sri

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:7
1. Length of second string: 3

Enter your choice:2
2. First string in uppercase: BOOMIKA
2. Second string in uppercase: SRI

Enter your choice:3
3. First string in lowercase: boomika
3. Second string in lowercase: sri

Enter your choice:4
4. Concatenated string:BoomiKaSri

Enter your choice:5
5. Enter a substring to check in the first string
5. Substring does not exist in the first string.

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

Enter your choice:7
```

PROGRAM 17

```
class Employee{
private int employeeId;
private String name;
private double salary;
public Employee(int employeeId, String name, double salary) {
this.employeeId = employeeId;
this.name = name;
this.salary = salary;
}
public int getEmployeeId() {
return employeeId;
}
public String getName() {
```

```

        return name;
    }
    public double getSalary() {
        return salary;
    }
    public void increaseSalary(double percentage) {
        if (percentage > 0) {
            salary += salary * (percentage / 100);
            System.out.println("Salary increased by " + percentage + "%. New salary: " + salary);
        } else {
            System.out.println("Invalid percentage. Salary remains unchanged.");
        }
    }
}

public class EmployeeExample {
    public static void main(String[] args) {
        Employee employee1 = new Employee(1, "Selvamathi", 50000.0);
        Employee employee2 = new Employee(2, "Gipsy", 60000.0);
        System.out.println("Employee 1: ID-" + employee1.getEmployeeId() + " Name-" +
                           employee1.getName() + " Salary-$ " + employee1.getSalary());
        System.out.println("Employee 2: ID-" + employee2.getEmployeeId() + " Name-" +
                           employee2.getName() + "Salary-$" + employee2.getSalary());
        employee1.increaseSalary(10);
        employee2.increaseSalary(-5);
        System.out.println("Updated Employee 1: Salary-$" + employee1.getSalary());
        System.out.println("Updated Employee 2: Salary-$" + employee2.getSalary());
    }
}

```

OUTPUT

Output ×

Run (Main) × Run (Employee) ×

--- exec:3.5.1:exec (default-cli) @ Employee ---

Enter the basic pay
30000
Gross Pay =43500.0
Net pay =39750.0

BUILD SUCCESS

Total time: 43.053 s
Finished at: 2025-12-09T16:30:56+05:30

PROGRAM 18

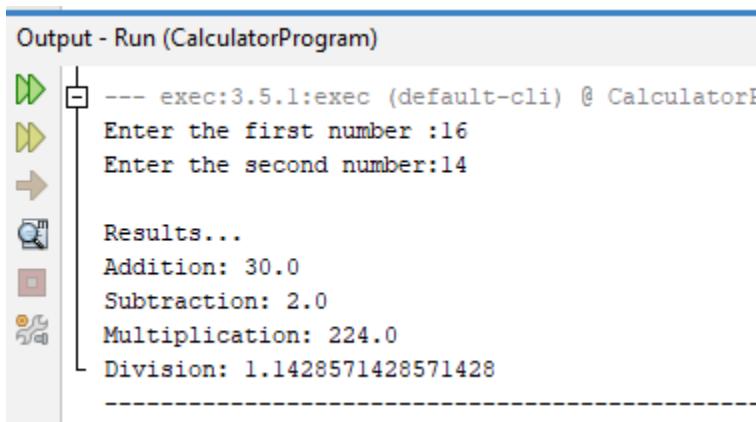
```
import java.util.Scanner;
interface Calculator{
    double add(double a,double b);
    double subtract(double a,double b);
    double multiply(double a,double b);
    double divide(double a,double b);
}
class SimpleCalculator implements Calculator{
    @Override
    public double add(double a,double b){
        return a+b;
    }
    @Override
    public double subtract(double a,double b){
        return a-b;
    }
    @Override
    public double multiply(double a,double b){
        return a*b;
    }
    @Override
    public double divide(double a,double b){
        if(b==0){
            System.out.println("Error:Division by zero is not allowed");
            return Double.NaN;
        }
        return a/b;
    }
}
public class CalculatorProgram {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        Calculator calculator = new SimpleCalculator();
        System.out.print("Enter the first number :");
        double num1 = scanner.nextDouble();
        System.out.print("Enter the second number:");
        double num2 = scanner.nextDouble();
        System.out.println("\nResults...");
        System.out.println("Addition: "+ calculator.add(num1,num2));
        System.out.println("Subtraction: "+ calculator.subtract(num1,num2));
        System.out.println("Multiplication: "+ calculator.multiply(num1, num2));
        System.out.println("Division: "+ calculator.divide(num1, num2));
    }
}
```

```
    scanner.close();
}

}
```

OUTPUT



```
Output - Run (CalculatorProgram)
--- exec:3.5.1:exec (default-cli) @ CalculatorP
Enter the first number :16
Enter the second number:14
Results...
Addition: 30.0
Subtraction: 2.0
Multiplication: 224.0
Division: 1.1428571428571428
```

PROGRAM 19

```
import java.util.Scanner;
public class ExceptionHandling {
public static void main(String[] args) {
Scanner scanner = new Scanner (System.in);
System.out.print("Enter first num: ");
int num1 = scanner.nextInt();
System.out.print("Enter second num: ");
int num2 = scanner.nextInt();
System.out.println("\nResults: ");

try {
System.out.println("Addition: " + (num1 + num2));
System.out.println("Subtraction: "+ (num1 - num2));
System.out.println("Multiplication: " + (num1 * num2));
System.out.println("Division: " + (num1 / num2));
} catch (ArithmaticException e) {
System.out.println("Error: "+e.getMessage());
} finally {
System.out.println("\nExecution Completed!");
}
}
```

```
}
```

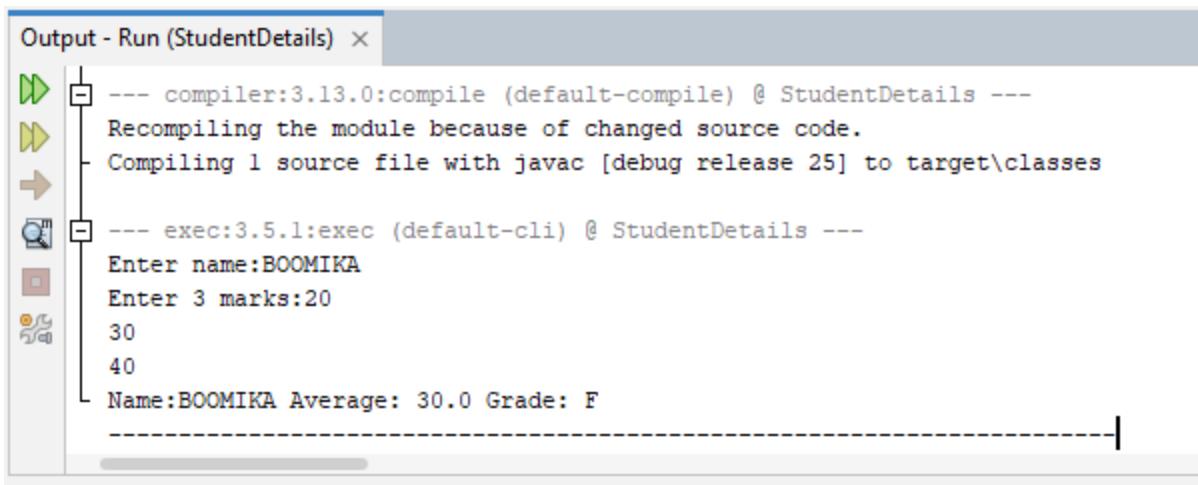
```
}
```

OUTPUT

```
run:  
Enter first num: 23  
Enter second num: 32  
  
Results:  
Addition: 55  
Subtraction: -9  
Multiplication: 736  
Division: 0  
  
Execution Completed!  
BUILD SUCCESSFUL (total time: 14 seconds)
```

```
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();  
    }  
}
```

OUTPUT



```
Output - Run (StudentDetails) ×

--- compiler:3.13.0:compile (default-compile) @ StudentDetails ---
Recompiling the module because of changed source code.
Compiling 1 source file with javac [debug release 25] to target\classes

--- exec:3.5.1:exec (default-cli) @ StudentDetails ---
Enter name:BOOMIKA
Enter 3 marks:20
30
40
Name:BOOMIKA Average: 30.0 Grade: F
```

PROGRAM 20

```
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("Circle Area:" + circle.calculateArea());
        System.out.println("Rectangle Area:" + rectangle.calculateArea());
        System.out.println("Square Area:"+ square.calculateArea());
    }
}

```

OUTPUT

```

Output - Run (Inheritance) ×

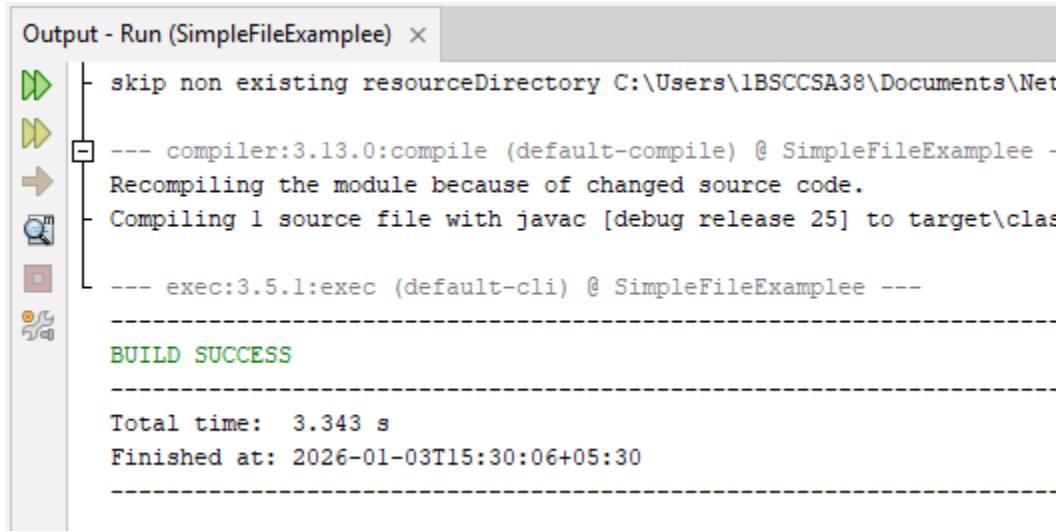
--- exec:3.5.1:exec (default-cli) @ Inheritance ---
Circle Area:12.56
Rectangle Area:24.0
Square Area:16.0
-----
BUILD SUCCESS
-----
Total time: 1.457 s
Finished at: 2025-12-11T13:36:39+05:30
-----
```

PROGRAM 21

```

import java.io.*;
public class SimpleFileExamplee {
    public static void main(String[] args) {
        try (FileOutputStream fos = new FileOutputStream("file.txt")) {
            fos.write("Hello, World!".getBytes());
        } catch (IOException e) {
            System.out.println("Error:" + e.getMessage());
        }
    }
}
```

OUTPUT



The screenshot shows the 'Output - Run (SimpleFileExamplee)' tab in the Android Studio interface. The log output is as follows:

```
skip non existing resourceDirectory C:\Users\1BSCCSA38\Documents\Net
--- compiler:3.13.0:compile (default-compile) @ SimpleFileExamplee -
Recompiling the module because of changed source code.
Compiling 1 source file with javac [debug release 25] to target\clas
--- exec:3.5.1:exec (default-cli) @ SimpleFileExamplee ---
-----
BUILD SUCCESS
-----
Total time: 3.343 s
Finished at: 2026-01-03T15:30:06+05:30
-----
```

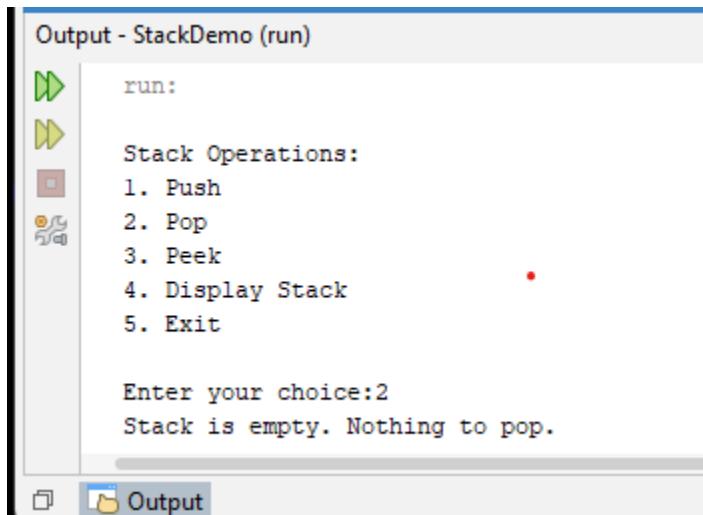
PROGRAM 22

```
import java.util.*;
public class StackDemo {
    public static void main(String[] args) {
        Stack <Integer> stack = new Stack<>();
        Scanner scanner = new Scanner(System.in);
        System.out.println("\nStack Operations:");
        System.out.println("1. Push");
        System.out.println("2. Pop");
        System.out.println("3. Peek");
        System.out.println("4. Display Stack");
        System.out.println("5. Exit");
        while (true) {
            System.out.print("\nEnter your choice:");
            int choice = scanner.nextInt();
            switch (choice) {
                case 1:
                    System.out.print("Enter a number to push:");
                    int num = scanner.nextInt();
                    stack.push(num);
                    System.out.println(num + " pushed onto the stack.");
                    break;
                case 2:
                    if (!stack.isEmpty()) {
                        int pop = stack.pop();
                        System.out.println("Popped element: " + pop);
                    }
            }
        }
    }
}
```

```
    } else {
        System.out.println("Stack is empty. Nothing to pop.");
    }
    break;
case 3:
if (!stack.isEmpty()) {
    System.out.println("Top element: " + stack.peek());
} else {
    System.out.println("Stack is empty.");
}
break;
case 4:

System.out.println("Current Stack:" + stack);
break;
case 5:
System.out.println("Exiting program...");
return;
default:
System.out.println("Invalid choice! Please enter a valid option.");
}
scanner.close();
}
}
}
```

OUTPUT



The screenshot shows the Eclipse IDE's Output view for a Java application named "StackDemo". The title bar says "Output - StackDemo (run)". The output window contains the following text:

```
run:
Stack Operations:
1. Push
2. Pop
3. Peek
4. Display Stack
5. Exit

Enter your choice:2
Stack is empty. Nothing to pop.
```

PROGRAM 23

```
import java.util.*;

public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        List<Integer> arrayList = new ArrayList<>();
        List<Integer> linkedList = new LinkedList<>();

        System.out.println("\nChoose an operation:");
        System.out.println("1. Add an element");
        System.out.println("2. Remove an element");
        System.out.println("3. Display lists");
        System.out.println("4. Exit");
        while (true) {
            System.out.print("\nEnter your choice:");
            int choice = scanner.nextInt();
            switch (choice) {
                case 1:
                    System.out.print("Enter number to add: ");
                    int num = scanner.nextInt();
                    arrayList.add(num);
                    linkedList.add(num);
                    System.out.println(num + "added to both lists.");
                    break;
                case 2:
                    if (arrayList.isEmpty() || linkedList.isEmpty()) {
                        System.out.println("Lists are empty! Nothing to remove.");
                    } else {
                        System.out.print("Enter number to remove:");
                        int removeNum = scanner.nextInt();
                        arrayList.remove(Integer.valueOf(removeNum));
                        linkedList.remove(Integer.valueOf(removeNum));
                        System.out.println(removeNum + "removed from both lists.");
                    }
                    break;
                case 3:
                    System.out.println("ArrayList: " + arrayList);
                    System.out.println("LinkedList: " + linkedList);
                    break;
                case 4:
                    System.out.println("Exiting...");
                    scanner.close();
            }
        }
    }
}
```

```
return;  
default:  
    System.out.println("Invalid choice! Try again.");  
}  
}  
}  
}
```

OUTPUT

```
Output - Main.java  
run:  
  
Choose an operation:  
1. Add an element  
2. Remove an element  
3. Display lists  
4. Exit  
  
Enter your choice:2  
Lists are empty! Nothing to remove.  
  
Enter your choice:3  
ArrayList: []  
LinkedList: []  
  
Enter your choice:1  
Enter number to add: 34  
34added to both lists.  
  
Enter your choice:4  
Exiting...  
BUILD SUCCESSFUL (total time: 27 seconds)
```