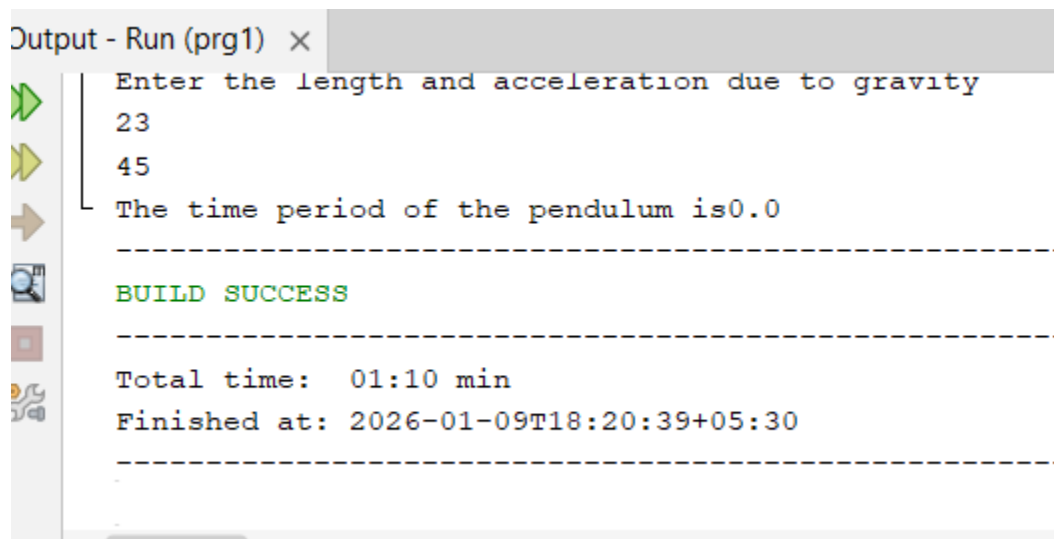


PROGRAMS OF JAVA

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

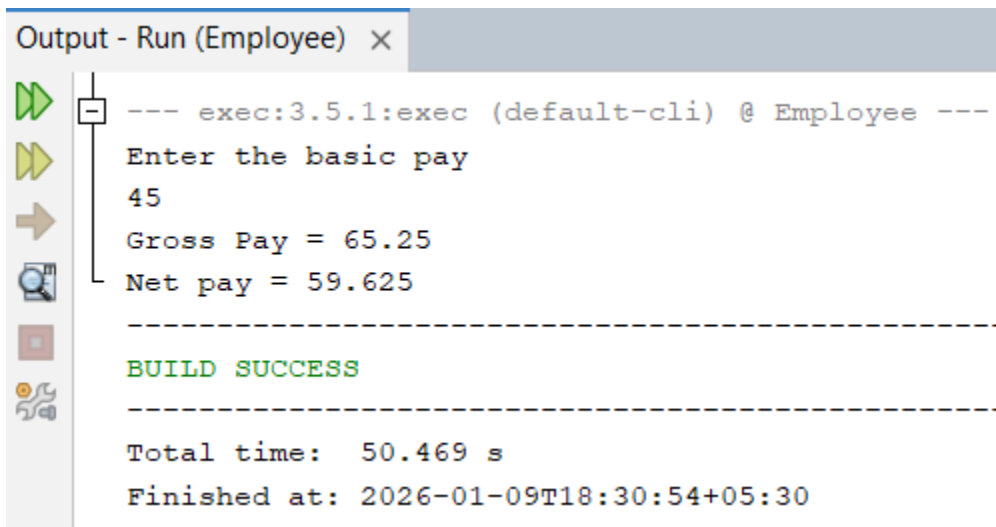


```
Output - Run (prg1) ×
Enter the length and acceleration due to gravity
23
45
The time period of the pendulum is0.0
-----
BUILD SUCCESS
-----
Total time: 01:10 min
Finished at: 2026-01-09T18:20:39+05:30
-----
```

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) x
--- 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

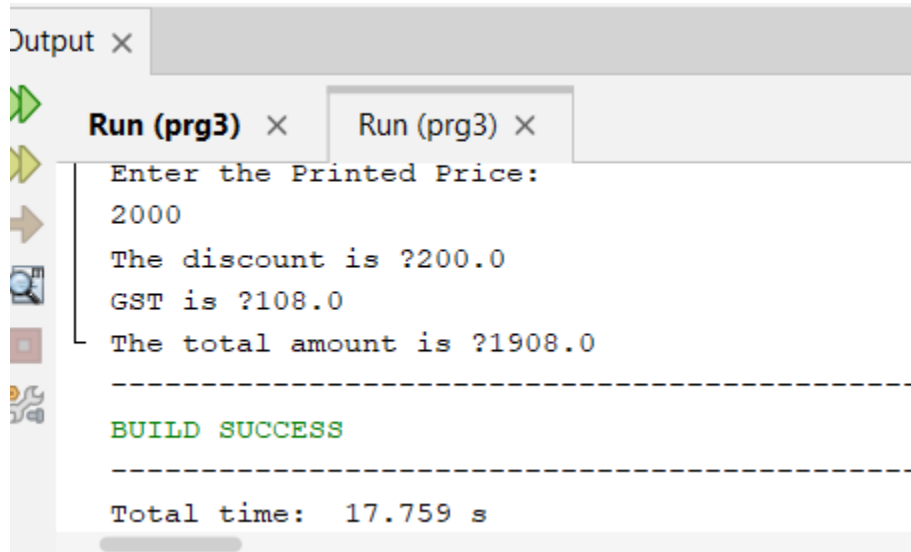
```
import java.util.*;
class Prg3{
public static void main(String args[]){
Scanner sc = new Scanner(System.in);
System.out.println("Enter the Printed Price:");
int p= sc.nextInt();
double d = 0.1 * p;
double dp = p - d;
double gst = 0.06 * dp;
```

```

double amount = dp + gst;
System.out.println("The discount is \u20B9"+d +"\nGST is \u20B9"+gst);
System.out.println("The total amount is \u20B9"+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

```

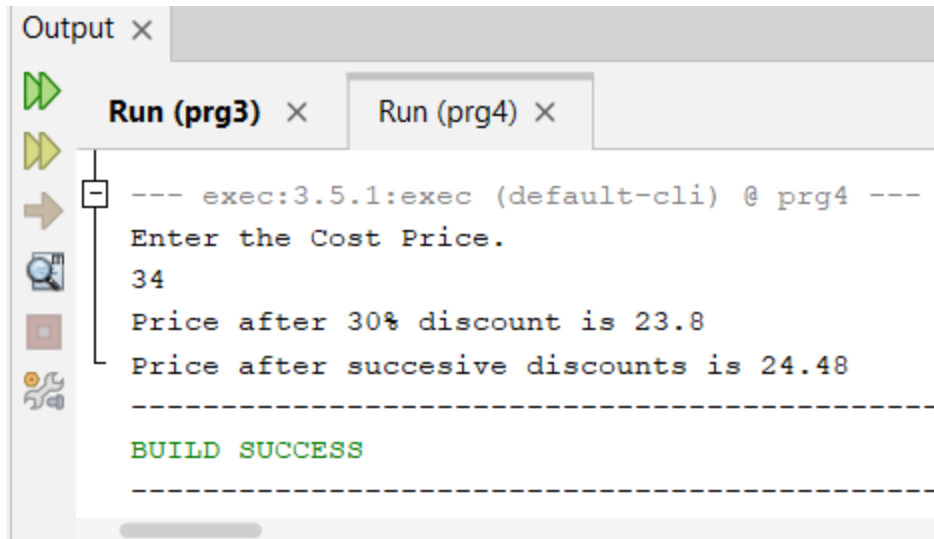
PROGRAM 4

```

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 succesive discounts is "+price4);
}
}

```

OUTPUT

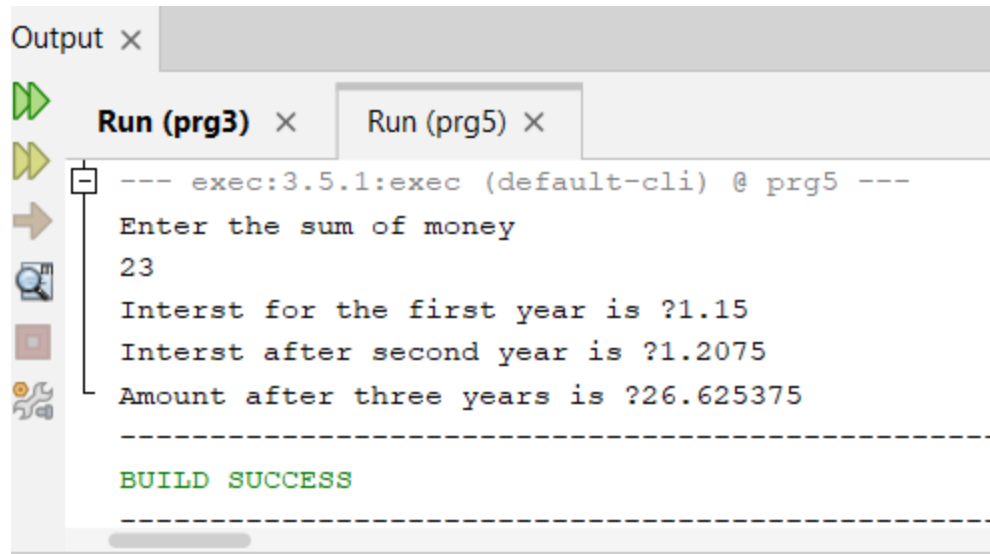


```
--- exec:3.5.1:exec (default-cli) @ prg4 ---
Enter the Cost Price.
34
Price after 30% discount is 23.8
Price after successive discounts is 24.48
-----
BUILD SUCCESS
-----
```

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("Interst for the first year is \u20B9"+in1); sum
+= in1;
double in2 = sum * 5 * 1 / 100.0;
System.out.println("Interst after second year is \u20B9"+in2); sum
+= in2;
double in3 = sum * 5 * 1 /100.0;
sum += in3;
System.out.println("Amount after three years is \u20B9"+sum);
}
}
```

OUTPUT

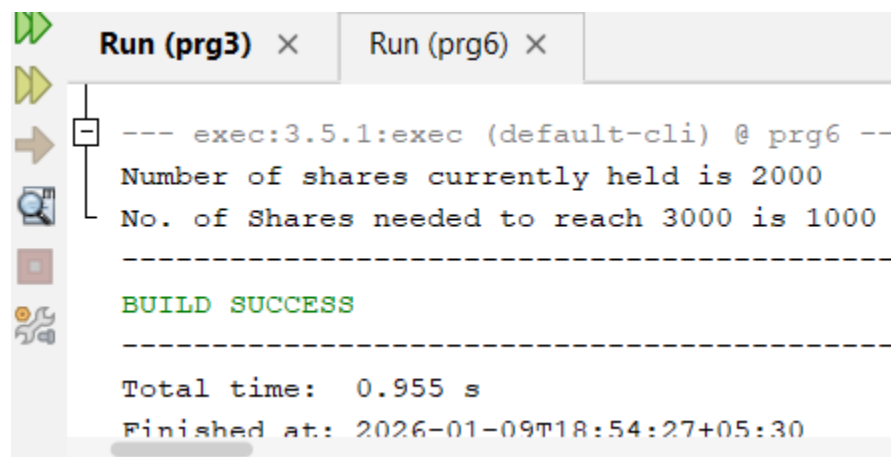


```
Output x
Run (prg3) x Run (prg5) x
--- exec:3.5.1:exec (default-cli) @ prg5 ---
Enter the sum of money
23
Interst for the first year is ?1.15
Interst after second year is ?1.2075
Amount after three years is ?26.625375
-----
BUILD SUCCESS
-----
```

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) x Run (prg6) x
--- 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

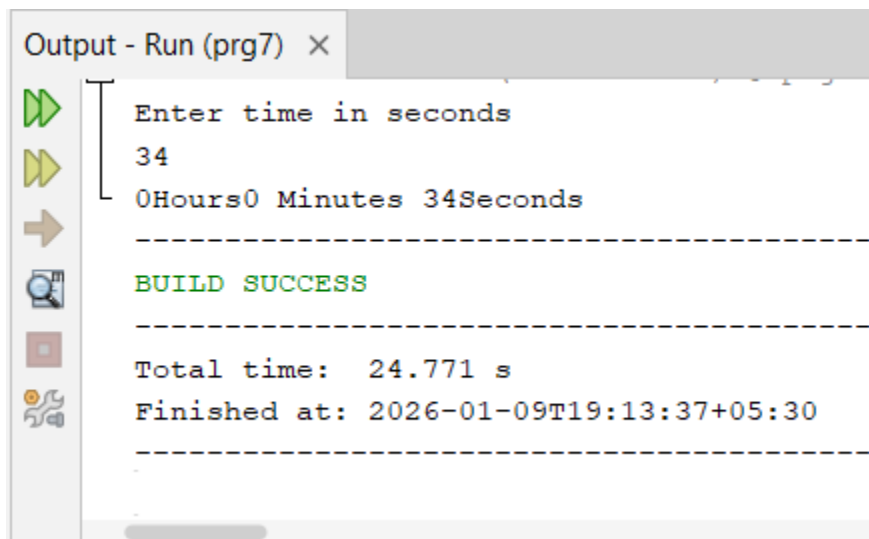
```
import java.util.*;
class Prg7{
```

```

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) x
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

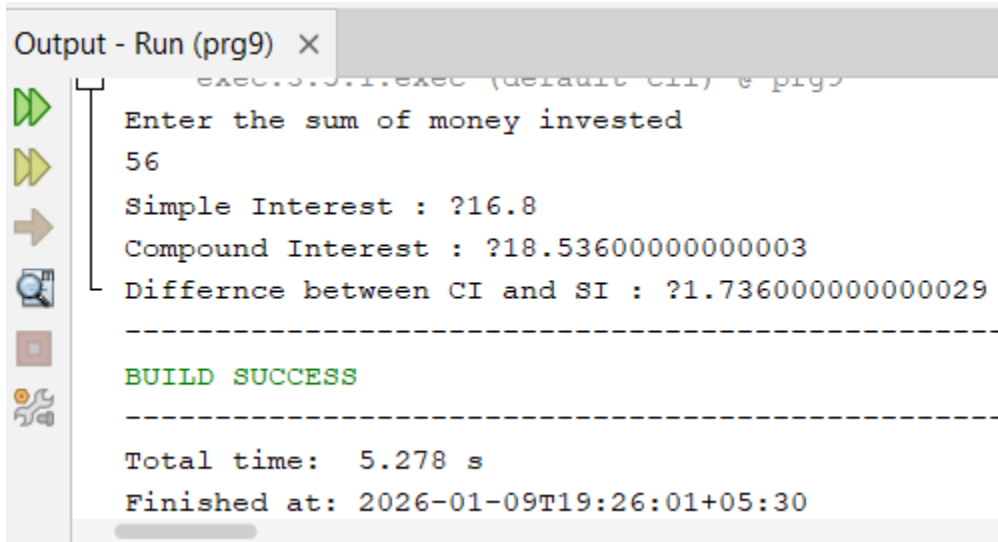
```

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 : \u20B9"+si);
System.out.println("Compound Interest : \u20B9"+ci);
System.out.println("Difference between CI and SI : \u20B9"+dif);
}
}

```

```
}
```

OUTPUT

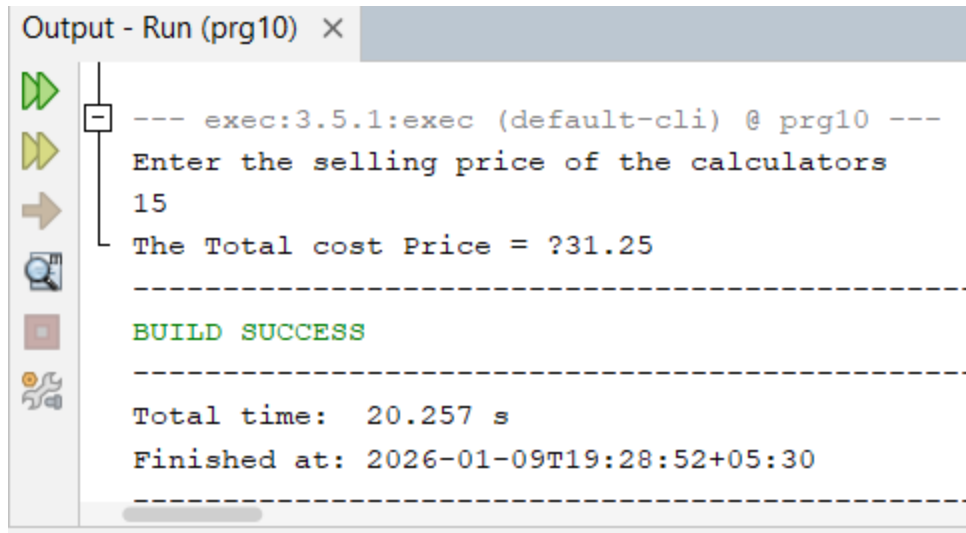
A screenshot of an IDE's output window titled "Output - Run (prg9)". The window shows the execution of a Java program. It starts with a prompt "Enter the sum of money invested" followed by the input "56". The program then calculates and displays "Simple Interest : ?16.8", "Compound Interest : ?18.536000000000003", and "Differnce between CI and SI : ?1.7360000000000029". There are dashed lines separating the output from the build status, which is "BUILD SUCCESS". At the bottom, it shows "Total time: 5.278 s" and "Finished at: 2026-01-09T19:26:01+05:30".

```
Output - Run (prg9) X
exec.J.J.I.exec (default cli) e 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

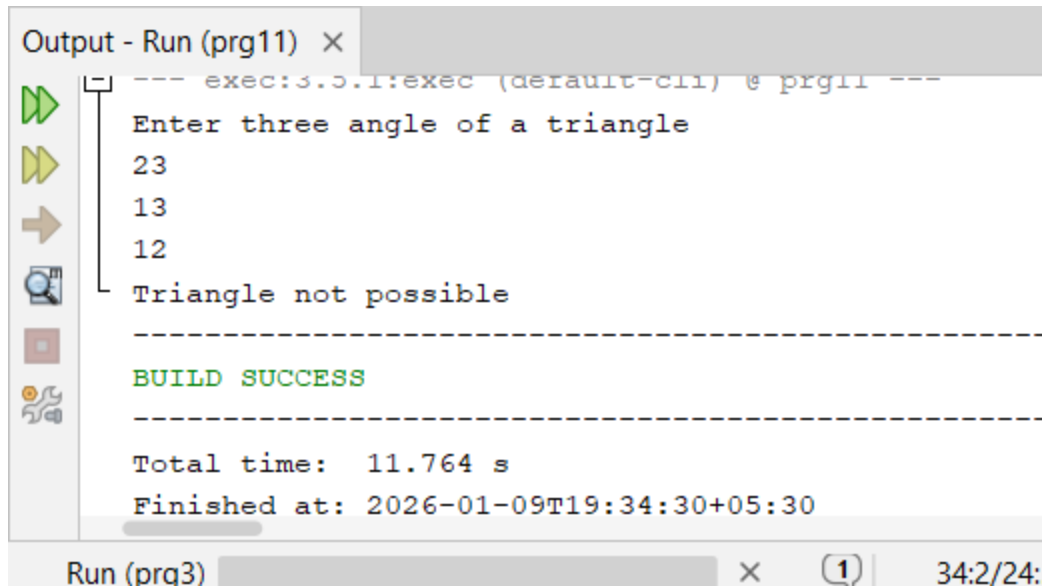


```
Output - Run (prg10) ×
--- exec:3.5.1:exec (default-cli) @ prg10 ---
Enter the selling price of the calculators
15
The Total cost Price = ?31.25
-----
BUILD SUCCESS
-----
Total time: 20.257 s
Finished at: 2026-01-09T19:28:52+05:30
-----
```

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

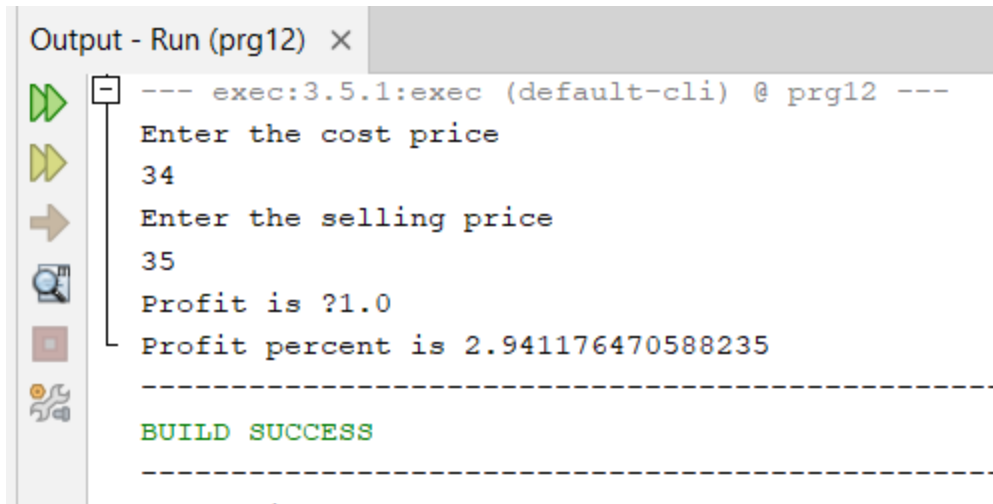


```
Output - Run (prg11) ×
--- exec:3.5.1:exec (default-cli) @ prg11 ---
Enter three angle of a triangle
23
13
12
Triangle not possible
-----
BUILD SUCCESS
-----
Total time: 11.764 s
Finished at: 2026-01-09T19:34:30+05:30
Run (prg3) × (1) 34:2/24:
```

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 \u20B9"+profit+"\nProfit percent is "+profitp);
}else
if(cp>sp){
double loss = cp - sp;
double losspercent = loss / cp * 100.0;
System.out.println("Loss is \u20B9"+loss+"\nLoss percent is "+losspercent);
}else{
System.out.println("Neither profit nor loss");
}
}
}
```

OUTPUT

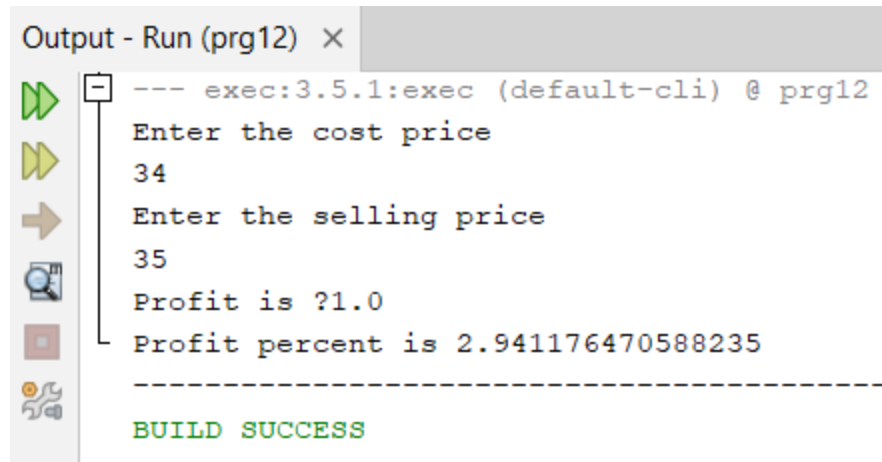
A screenshot of an IDE's output window titled "Output - Run (prg12) x". The window shows the execution of a program. It starts with a prompt "Enter the cost price" where the user entered "34". Then it prompts "Enter the selling price" where the user entered "35". The program then outputs "Profit is ?1.0" and "Profit percent is 2.941176470588235". Below this, there is a dashed line, the text "BUILD SUCCESS" in green, and another dashed line. On the left side of the output window, there is a vertical toolbar with icons for running, stepping through, and other debugging actions.

```
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 nuber is "+d);
}
}
}
```

OUTPUT

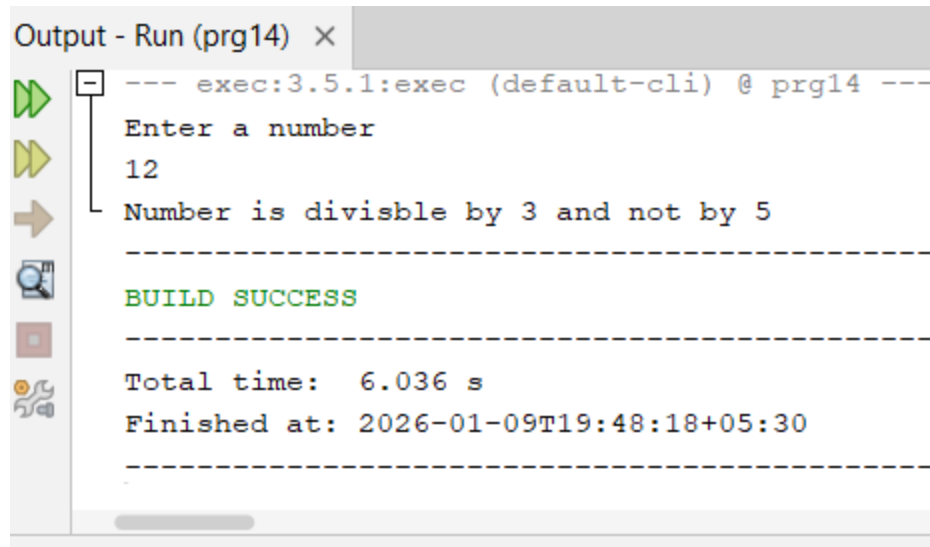


```
Output - Run (prg12) ×
--- exec:3.5.1:exec (default-cli) @ prg12
Enter the cost price
34
Enter the selling price
35
Profit is ?1.0
Profit percent is 2.941176470588235
-----
BUILD SUCCESS
```

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

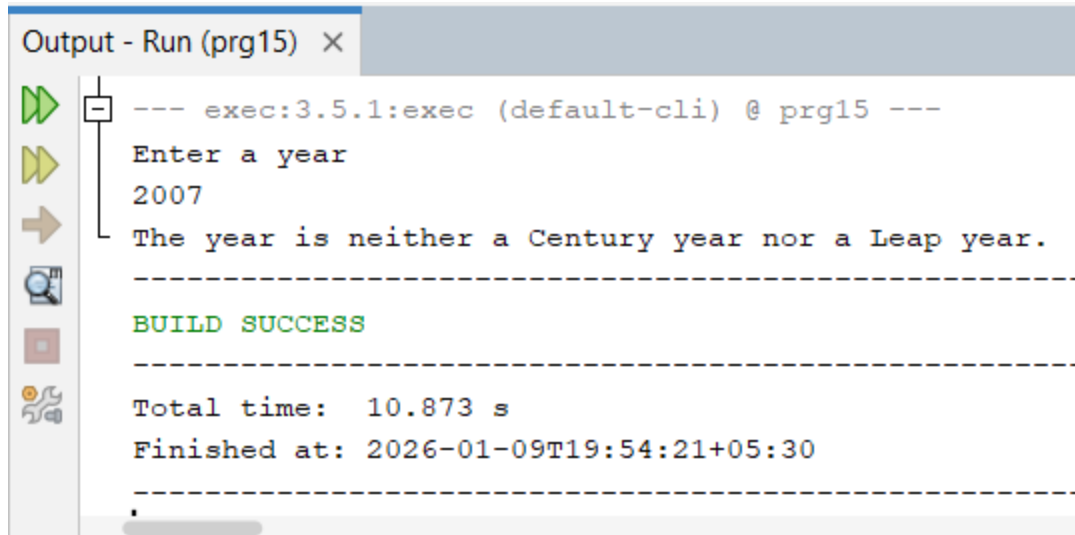


```
Output - Run (prg14) X
--- exec:3.5.1:exec (default-cli) @ prg14 ---
Enter a number
12
Number is divisble by 3 and not by 5
-----
BUILD SUCCESS
-----
Total time: 6.036 s
Finished at: 2026-01-09T19:48:18+05:30
-----
```

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

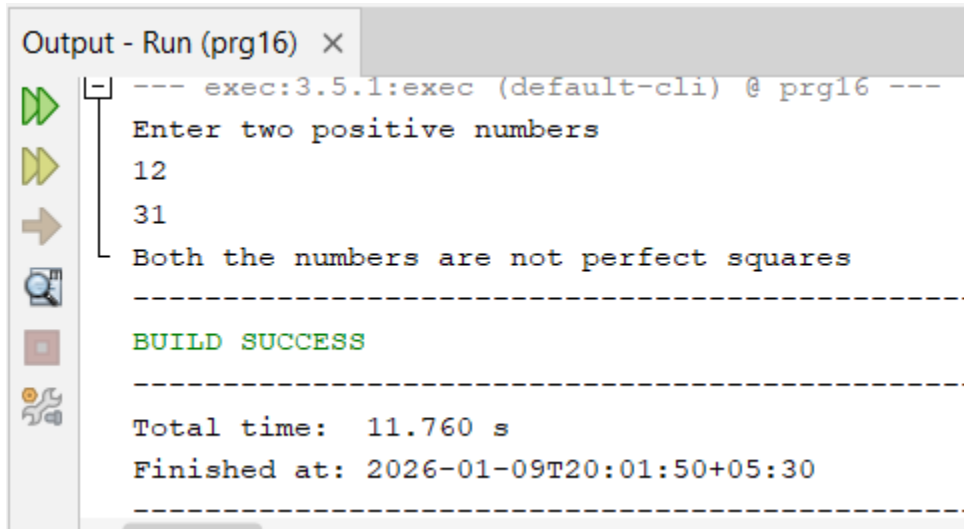


```
Output - Run (prg15) X
--- exec:3.5.1:exec (default-cli) @ prg15 ---
Enter a year
2007
The year is neither a Century year nor a Leap year.
-----
BUILD SUCCESS
-----
Total time: 10.873 s
Finished at: 2026-01-09T19:54:21+05:30
-----
```

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 numbes are perfect squares");
}else if(c == 0 && d != 0 ){
System.out.println(a+"is a Perfect Square"+"\\n"+b+" is not a PerfectSquare");
}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

A screenshot of an IDE's output window titled "Output - Run (prg16)". The window shows the execution of a Java program. It starts with a separator line "--- exec:3.5.1:exec (default-cli) @ prg16 ---". The program prompts "Enter two positive numbers", and the user enters "12" and "31". The program then outputs "Both the numbers are not perfect squares". This is followed by a dashed line, the text "BUILD SUCCESS" in green, another dashed line, "Total time: 11.760 s", "Finished at: 2026-01-09T20:01:50+05:30", and a final dashed line. On the left side of the output window, there is a vertical toolbar with icons for running, stepping through, and other debugging actions.

```
Output - Run (prg16) X
--- 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 x
Run (MARK) x Run (MARK) x
Compiling 1 source file with javac [debug release 20] to target\classes
--- 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 string6
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
Run (MARK)
```

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, "Gripsy", 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 x
Run (Main) x Run (Employee) x
--- 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));
    }
}
```

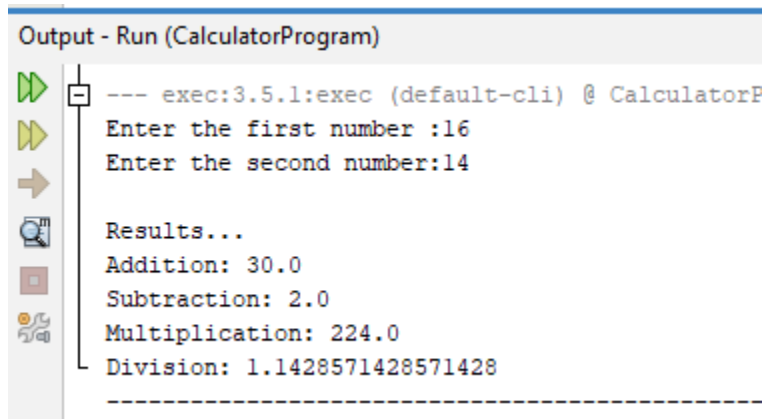
```

        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;

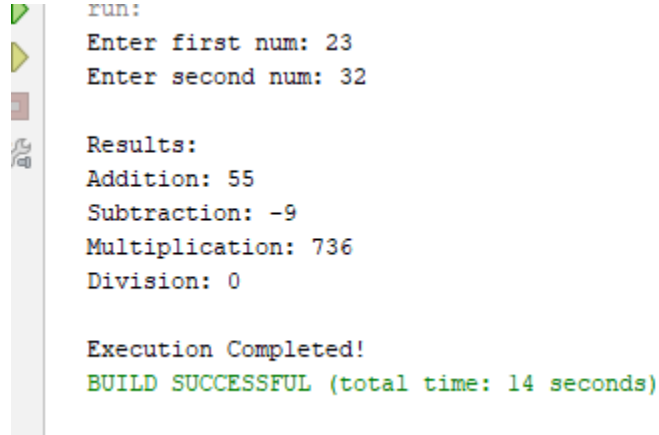
public class ExceptionHandling {
    public static void main(String[] args) {
        Scanner scanner = new Scanner (System.in);
        System.out.print("Enter first num: ");
        int num1 = scanner.nextInt();
        System.out.print("Enter second num: ");
        int num2 = scanner.nextInt();
        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 (ArithmeticException e) {
            System.out.println("Error: "+e.getMessage());
        } finally {
            System.out.println("\nExecution Completed!");
        }
    }
}

```

```
}  
}
```

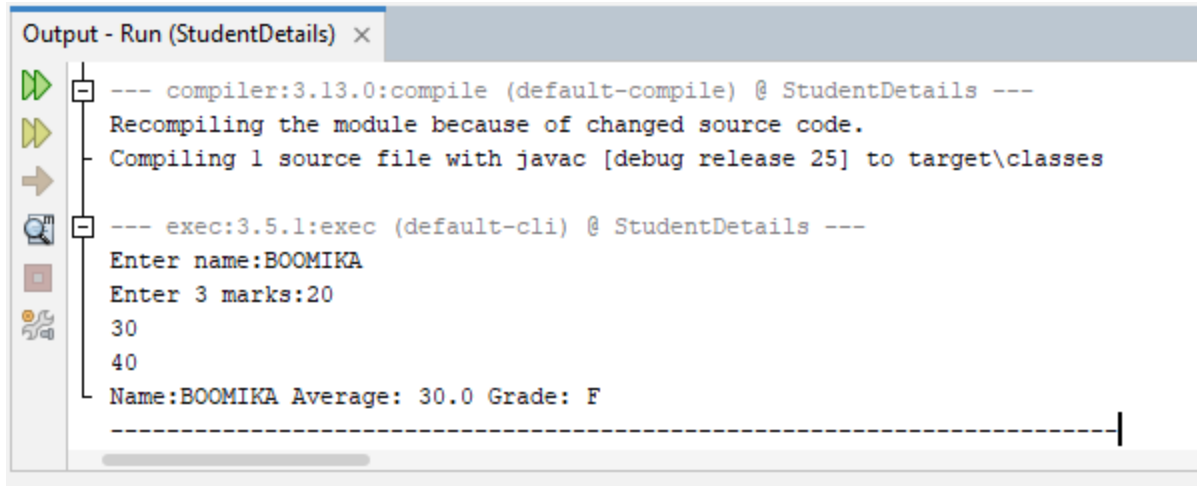
OUTPUT



```
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) x
--- 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

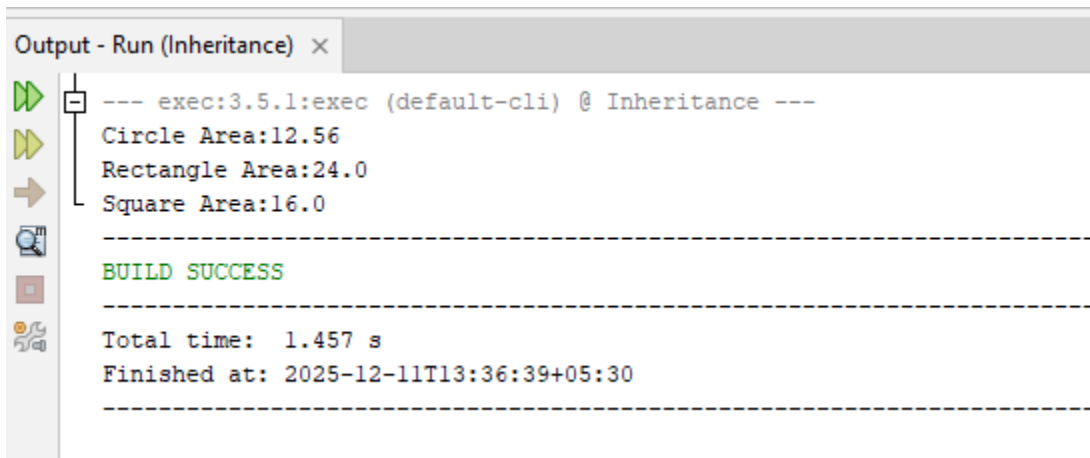
```
abstract class Shape
{
    public abstract double calculateArea();
}
class Circle extends Shape {
    private double radius;
    public Circle(double radius){
        this.radius=radius;
    }
    @Override
    public double calculateArea(){
        return 3.14* radius * radius;
    }
}
class Rectangle 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



The screenshot shows an IDE output window titled "Output - Run (Inheritance)". The output text is as follows:

```

--- 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
-----

```

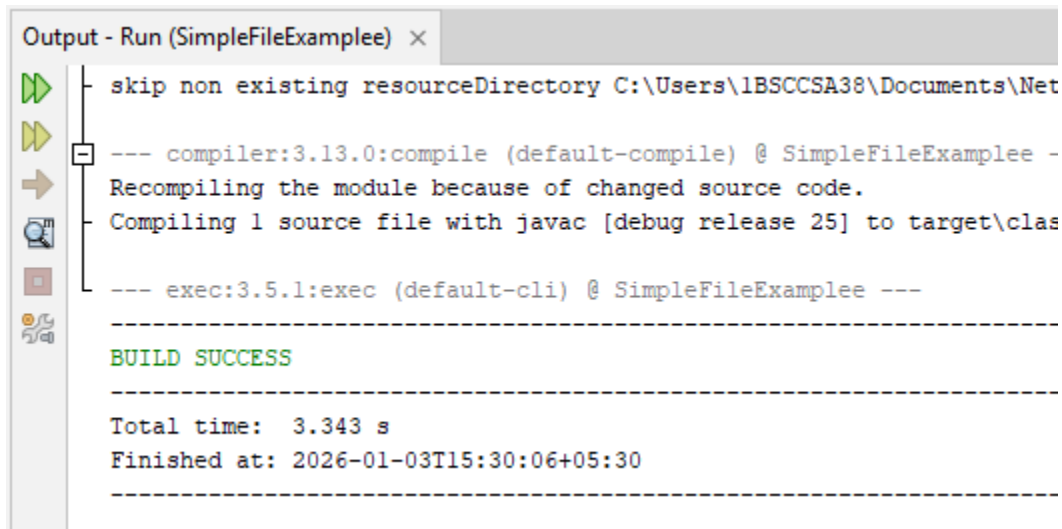
PROGRAM 21

```

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



```
Output - Run (SimpleFileExamplee) x
- 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);
                    }
                }
            }
        }
    }
}
```

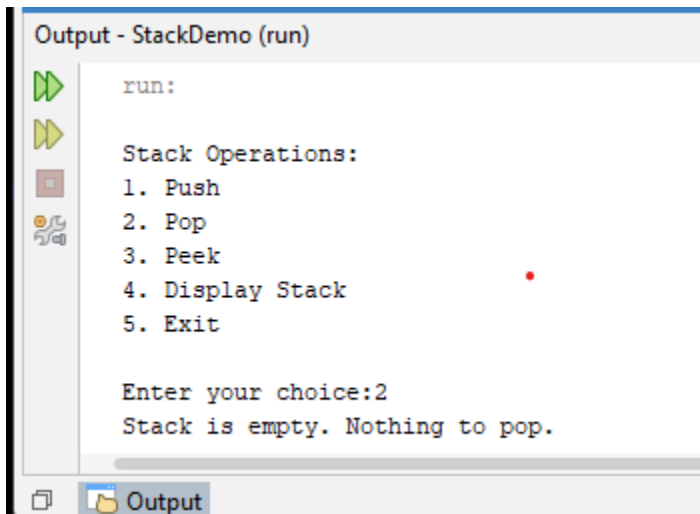
```

    } 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



```

Output - StackDemo (run)

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 (run)
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)
|
```