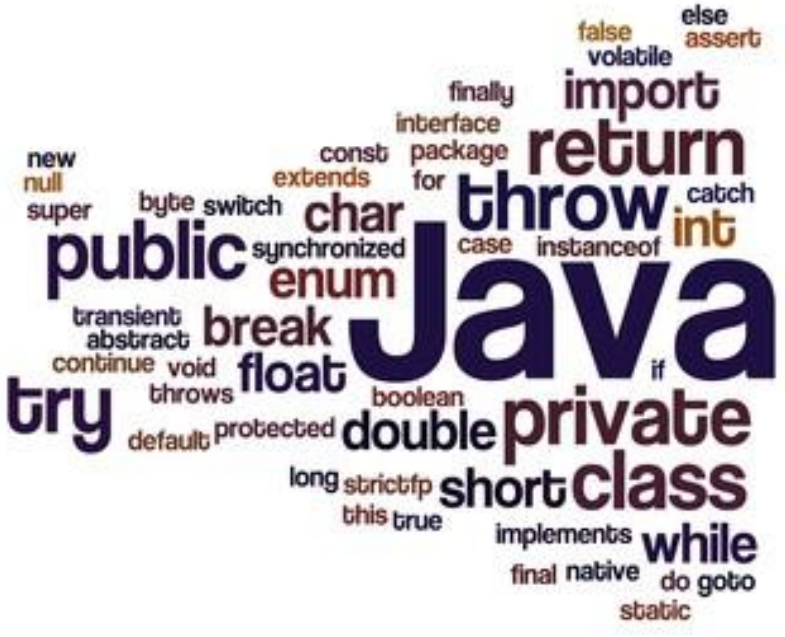
Computer Applications Project



Name: Allen Thomas M

Class: 10th **Section:** C

Register Number:

Date of Submission:

Year: 2025-2026

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Project Preview

This project collates all the Java Programs that were done during 9th Grade. The Programs in the project leverages the Scanner class to make it user interactive. The project covers conditional constructs (if, else if, else), looping constructs (while and for), as well as menu-driven programs utilizing switch-case control structures.

The Project was run using BlueJ. The codebase is shared at Github. The location for the same is provided below.

https://github.com/allenthomasmuttikal/Java_Project

JAVA Programs

Program-1

Program Name: Sum_and_Product

Problem Statement: Develop a Java program that prompts the user to input two integers. The program should then calculate and display both the sum and the product of these numbers.

Java Code:

```
import java.util.Scanner;
/**
 * This program calculates and displays the sum and product of the entered 2 numbers
 *
 * @author (Allen Thomas.M)
 * @author email (allenthomasmuttikal@gmail.com)
 * @author git(https://github.com/allenthomasmuttikal/Java_Project)
 * @version (v1.0)
 */
public class Sum_and_Product
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter 2 numbers");
      int a = ob.nextInt();
      int b = ob.nextInt();
      int sum = a + b;
      int prod = a * b;
      System.out.println("Output:");
      System.out.println("The sum of the 2 numbers is "+sum);
      System.out.println("The product of the 2 numbers is  "+prod);
```

```
    }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object to read user input from the console.
a	int	First integer input provided by the user.
b	int	Second integer input provided by the user.
sum	int	Stores the sum of the two integers a and b.
prod	int	Stores the product of the two integers a and b.

Output:

Program-2

Program Name: Area_of_Circle

Problem Statement: Design a Java program that calculates and displays the area of a circle based on a user-provided radius.

Java Code:

```
import java.util.Scanner;
/**
 * This program calculates and displays the area of a circle with the entered radius
 *
 * @author (Allen Thomas.M)
 * @author email (allenthomasmuttikal@gmail.com)
 * @author git(https://github.com/allenthomasmuttikal/Java_Project)
 * @version (v1.0)
 */
public class Area_of_Circle
{
   public static void main(String args[])
   {
     Scanner ob = new Scanner(System.in);
     float pi = 3.14f;
     float radius = 0.0f,area = 0.0f;
     System.out.println("Enter the radius");
     radius = ob.nextFloat();
     area = pi * radius * radius;
     System.out.println("Output:");
     System.out.println("The area of the circle with radius "+radius+" is : "+area);
   }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object for reading user input from the console.
pi	float	Represents the constant value of pi (3.14).
radius	float	Stores the user-entered radius of the circle.
area	float	Stores the calculated area of the circle.

Output:

Program-3

Program Name: Sum_of_First_and_Last_Digit

Problem Statement: Create a Java program that calculates and displays the sum of the first and last digits of a three-digit number.

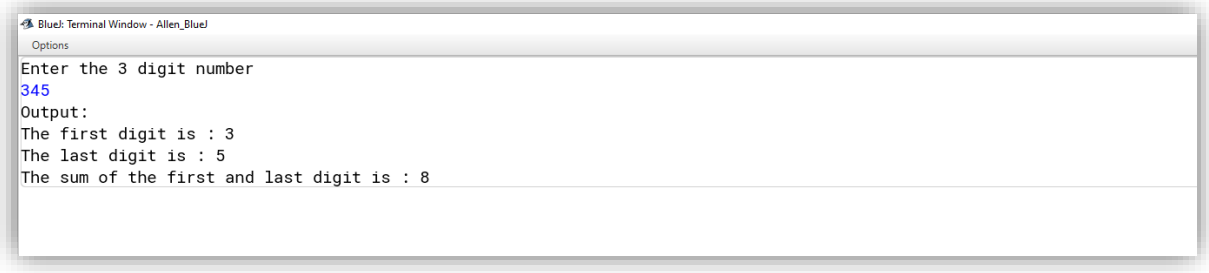
Java Code:

```
import java.util.Scanner;
/**
 * This program calculates and displays the sum of the first and last digit of the entered 3 digit number
 *
 * @author (Allen Thomas.M)
 * @author email (allenthomasmuttikal@gmail.com)
 * @author git(https://github.com/allenthomasmuttikal/Java_Project)
 * @version (v1.0)
 */
public class Sum_of_First_and_Last_Digit
{
  public static void main(String args[])
  {
    Scanner ob = new Scanner(System.in);
    System.out.println("Enter the 3 digit number");
    int num = ob.nextInt();
    int first = num / 100,last = num % 10,sum = first + last;
    System.out.println("Output:");
    System.out.println("The first digit is : "+first);
    System.out.println("The last digit is : "+last);
    System.out.println("The sum of the first and last digit is : "+sum);
  }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object for reading user input from the console.
num	int	Stores the 3-digit number input provided by the user.
first	int	Extracts and stores the first digit of the number num.
last	int	Extracts and stores the last digit of the number num.
sum	int	Stores the sum of the first and last digits of num.

Output:



Program-4

Program Name: Square_and_Cube

Problem Statement: Develop a Java program that prompts the user to enter an integer. The program should then calculate and display both the square and the cube of the entered number.

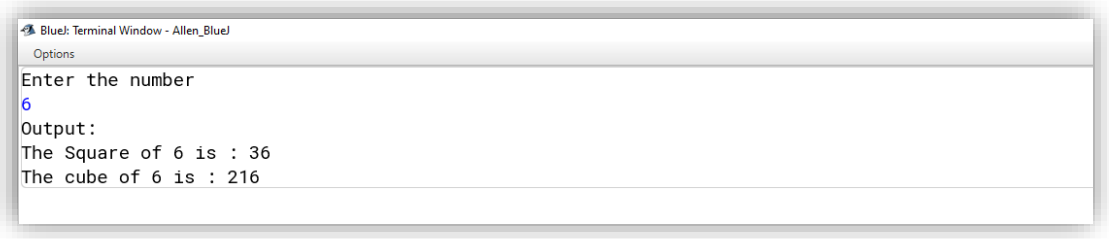
Java Code:

```
import java.util.Scanner;
/**
 * This program calculates and displays the sqaure and cube of the entered number
 *
 * @author (Allen Thomas.M)
 * @author email (allenthomasmuttikal@gmail.com)
 * @author git(https://github.com/allenthomasmuttikal/Java_Project)
 * @version (v1.0)
 */
public class Square_and_Cube
{
    public static void main(String args[])
    {
        Scanner ob = new Scanner(System.in);
        System.out.println("Enter the number");
        int num = ob.nextInt();
        int square = num * num,cube = num * num * num;
        System.out.println("Output:");
        System.out.println("The Square of "+num+" is : "+square);
        System.out.println("The cube of "+num+" is : "+cube);
    }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
Ob	Scanner	Object to read user input from the console.
Num	int	Stores the number input by the user.
Square	int	Stores the square of the user-entered number num.
Cube	int	Stores the cube of the user-entered number num.

Output:



Program-5

Program Name: Time

Problem Statement: Design a Java program that converts a time duration given in seconds into its equivalent representation in hours, minutes, and seconds.

Java Code:

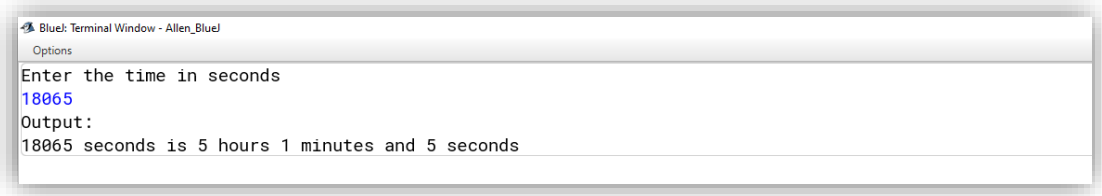
```
import java.util.Scanner;
/**
 * This program calculates and displays the time in hours, minutes and seconds, when the time is entered in seconds
 *
 * @author (Allen Thomas.M)
 * @author email (allenthomasmuttikal@gmail.com)
 * @author git(https://github.com/allenthomasmuttikal/Java_Project)
 * @version (v1.0)
 */
public class Time
{
   public static void main(String args[])
   {
      /*
       * 1 min=60sec
       1 hr=60*60sec=3600secs
      18005secs=18005/3600=hrs
      18065secs=18065/3600=5hrs
      18065secs=(18065%3600)/60=1min
         18065secs=(18065%3600)%60=5secs
       */
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter the time in seconds");
```

```
        int sec = ob.nextInt();
        int hours = sec / 3600;
        int minutes = (sec % 3600) / 60;
        int seconds = (sec % 3600) % 60;
        System.out.println("Output:");
        System.out.println(sec+" seconds is "+hours+" hours "+minutes+" minutes and "+seconds+" seconds" );
    }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object for reading user input from the console.
sec	int	Stores the total number of seconds input by the user.
hours	int	Stores the calculated hours extracted from sec.
minutes	int	Stores the calculated minutes extracted from sec.
seconds	int	Stores the remaining seconds after hours and minutes are calculated.

Output:



Program-6

Program Name: Even_or_Odd

Problem Statement: Create a Java program that determines whether a given integer is even or odd.

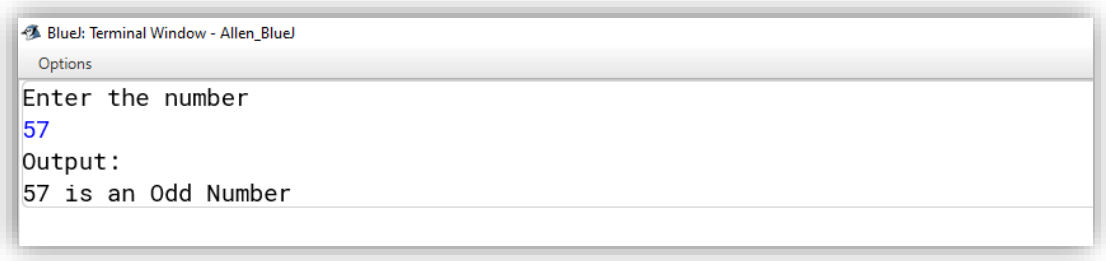
Java Code:

```
import java.util.Scanner;
/**
 * This program checks and displays if the entered number is an even or odd number
 *
 * @author (Allen Thomas.M)
 * @author email (allenthomasmuttikal@gmail.com)
 * @author git(https://github.com/allenthomasmuttikal/Java_Project)
 * @version (v1.0)
 */
public class Even_or_Odd
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter the number");
      int num = ob.nextInt();
      System.out.println("Output:");
      if(num % 2 == 0)
      System.out.println(num+" is an Even Number");
      else
      System.out.println(num+" is an Odd Number");
   }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object to read user input from the console.
num	int	Stores the number input provided by the user.

Output:



Program-7

Program Name: Positive_or_Negative

Problem Statement: Design a Java program that determines whether a given integer is positive, negative, or zero.

Java Code:

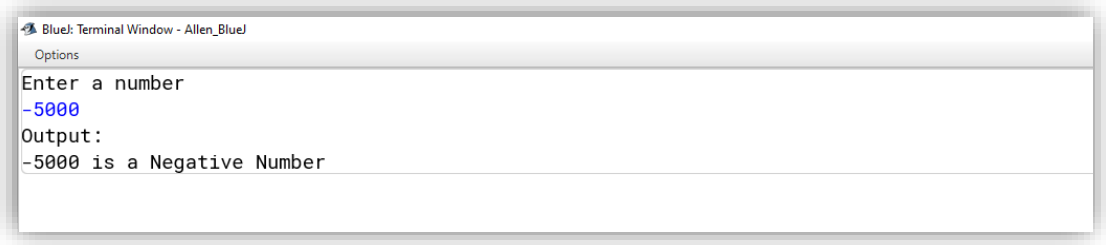
```
import java.util.Scanner;
/**
* This program checks and displays if the entered number is a Positive or Negative Number.
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
public class Positive_or_Negative
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter a number");
      int num = ob.nextInt();
      System.out.println("Output:");
      if(num > 0)
      System.out.println(num+" is a Positive Number");
      else if(num < 0)
      System.out.println(num+" is a Negative Number");
      else
      System.out.println(num+" is zero");
```

```
    }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object to read user input from the console.
num	int	Stores the number input provided by the user.

Output:



Program-8

Program Name: Leap_Year

Problem Statement: Develop a Java program that determines whether a given year is a leap year or not.

Java Code:

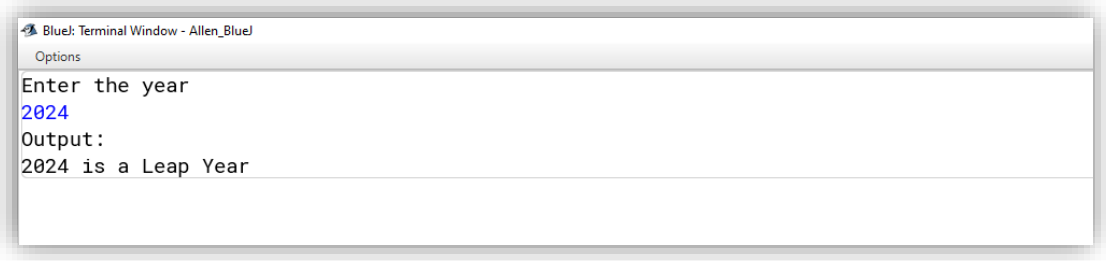
```
import java.util.Scanner;
/**
* This program checks and displays if the entered year is a Leap Year.
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
public class Leap_Year
{
    public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter the year");
      int year = ob.nextInt();
      System.out.println("Output:");
      if(year % 4 == 0 && year % 100 != 0) // Leap Year is divisible by 4 and not by 100(not a century year).
      System.out.println(year+" is a Leap Year");
      else if(year % 100 == 0 && year % 400 == 0) // Leap year is divisible by both 100 and 400.
      System.out.println(year+" is a Leap Year");
      else
```

```
        System.out.println(year+" is not a Leap Year");
    }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object to read user input from the console.
year	int	Stores the year entered by the user to check if it's a

Output:



Program-9

Program Name: Largest_of_two_Numbers

Problem Statement: Develop a Java program that compares two integer values inputted by the user and identifies the larger number.

Java Code:

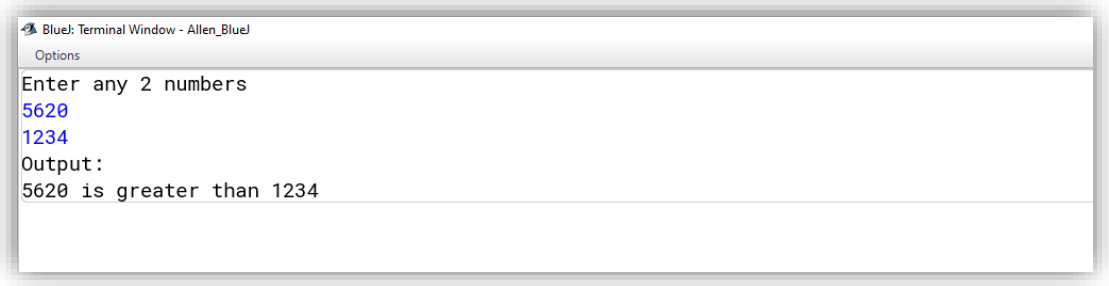
```
import java.util.Scanner;
/**
 * This program compares and displays which among the entered 2 numbers is greater
 *
 * @author (Allen Thomas.M)
 * @author email (allenthomasmuttikal@gmail.com)
 * @author git(https://github.com/allenthomasmuttikal/Java_Project)
 * @version (v1.0)
 */
public class Largest_of_two_Numbers
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter any 2 numbers");
      int a = ob.nextInt();
      int b = ob.nextInt();
      System.out.println("Output:");
      if(a > b)
      System.out.println(a+" is greater than "+b);
      else if(b > a)
      System.out.println(b+" is greater than "+a);
      else
```

```
        System.out.println(" Both the numbers are equal");
    }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object to read user input from the console.
a	int	Stores the first number input provided by the user.
b	int	Stores the second number input provided by the user.

Output:



Program-10

Program Name: Buzz_Number

Problem Statement: Design a Java program to determine whether a given integer is a "Buzz Number." In mathematical terms, a "Buzz Number" is a number that either ends with the digit 7 or is divisible by 7.

Java Code:

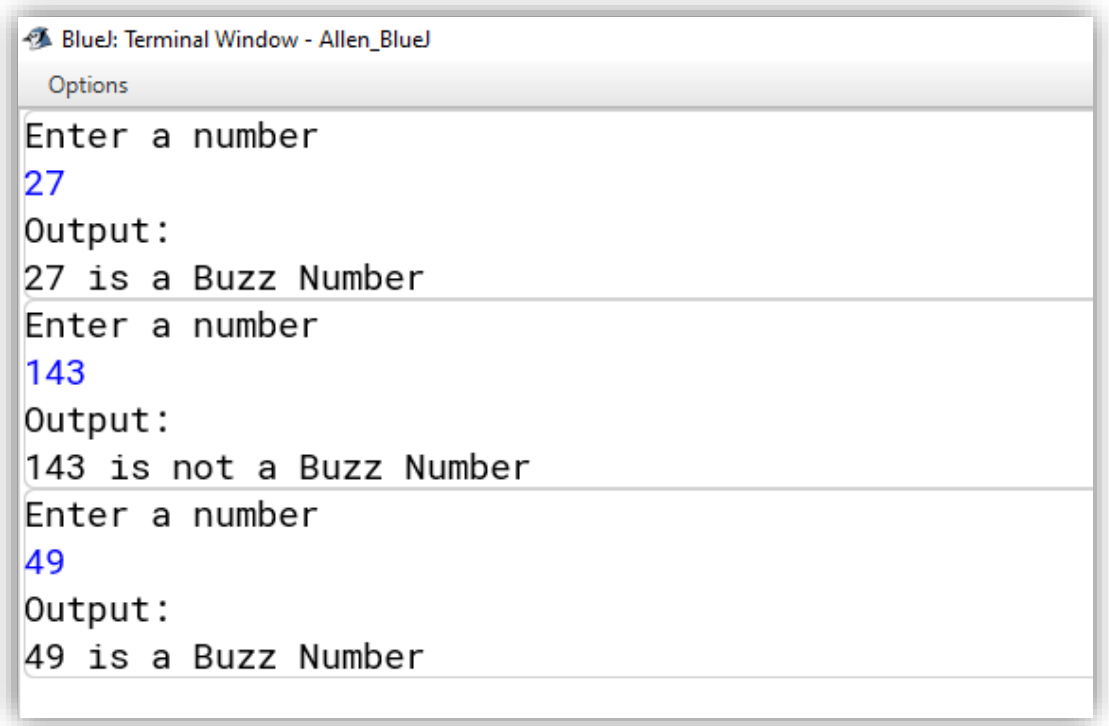
```
import java.util.Scanner;
/**
 * This program checks and displays if the entered number is a Buzz Number
 *
 * NOTE:In a mathematical context, a "buzz number" is a number that either
 * ends in the digit 7 or is divisible by 7. A number that satisfies either
 * of these conditions is considered a buzz number.
 *
 * @author (Allen Thomas.M)
 * @author email (allenthomasmuttikal@gmail.com)
 * @author git(https://github.com/allenthomasmuttikal/Java_Project)
 * @version (v1.0)
 */
public class Buzz_Number
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter a number");
      int num = ob.nextInt();
      System.out.println("Output:");
      if(num % 7 == 0 || num % 10 == 7)
      System.out.println(num+" is a Buzz Number");
```

```
        else
        System.out.println(num+" is not a Buzz Number");
    }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
num	int	Stores the number input by the user to check if it's a Buzz Number.

Output:



Program-11

Program Name: Largest_of_three_Numbers

Problem Statement: Create a Java program that identifies the greatest of three inputted integers.

Java Code:

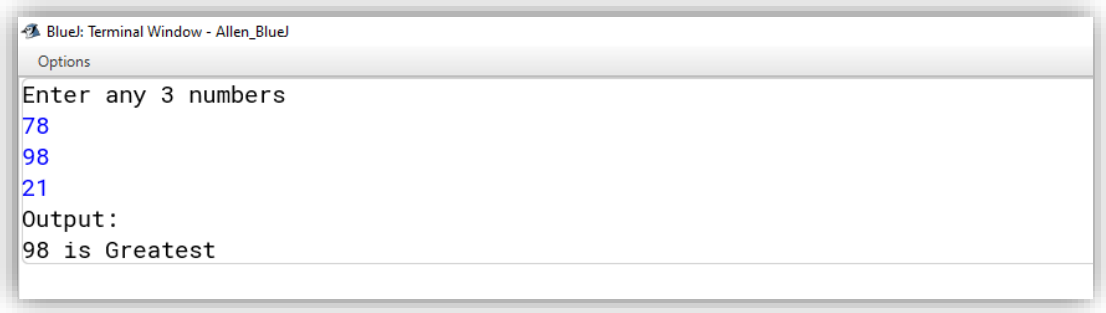
```
import java.util.Scanner;
/**
* This program checks and displays the Greatest Number of the entered 3 numbers
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
public class Largest_of_three_Numbers
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter any 3 numbers");
      int a = ob.nextInt();
      int b = ob.nextInt();
      int c = ob.nextInt();
      System.out.println("Output:");
      if(a > b && a > c)
      System.out.println(a+" is Greatest");
      else if(b > a && b > c)
      System.out.println(b+" is Greatest");
```

```
        else if(c > a && c > b)
        System.out.println(c+" is Greatest");
        else if(a == b && b == c)
        System.out.println(" All 3 numbers are equal");
    }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
a	int	Stores the first number input by the user.
b	int	Stores the second number input by the user.
c	int	Stores the third number input by the user.

Output:



Program-12

Program Name: Triangles

Problem Statement: Develop a Java program that determines whether a triangle can be formed using three user-provided side lengths. If the sides satisfy the triangle inequality theorem, classify the triangle as Equilateral, Isosceles, or Scalene based on its side lengths.

Java Code:

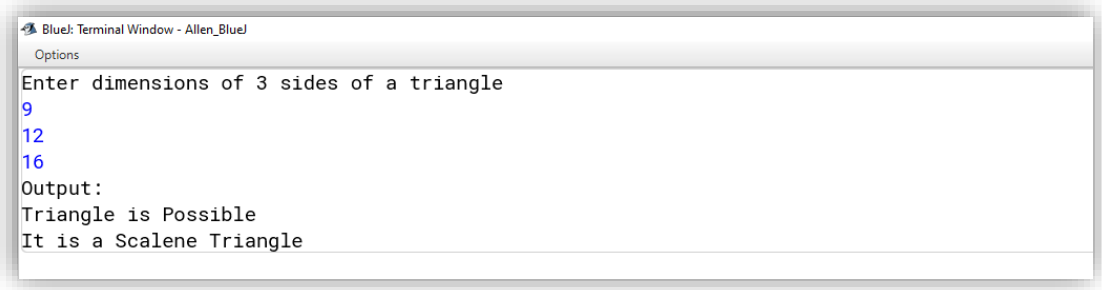
```
import java.util.Scanner;
/**
* This program calculates if a triangle is possible from the entered dimension. In addition it classifies the type of triangle.
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
public class Triangles
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter dimensions of 3 sides of a triangle");
      int a = ob.nextInt();
      int b = ob.nextInt();
      int c = ob.nextInt();
      System.out.println("Output:");
      if(a+b>c && b+c>a && a+c>b)
      {
```

```
        System.out.println("Triangle is Possible");


        if(a == b && b == c)
        System.out.println("It is an Equilateral Triangle");
        else if(a == b || b == c || a == c)
        System.out.println("It is an Isosceles Triangle");
        else
        System.out.println("It is a Scalene Triangle");
      }
      else
      System.out.println("Triangle is not Possible");
   }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
a	int	Stores the length of the first side of the triangle.
b	int	Stores the length of the second side of the triangle.
c	int	Stores the length of the third side of the triangle.

Output:



Program-13

Program Name: Kilometres

Problem Statement: Design a Java program to calculate and display the fare for a distance traveled in kilometers, based on predefined fare slabs.

- For distances up to 5 kilometers, the fare is ₹50.
- For distances between 6 and 15 kilometers, an additional ₹12 per kilometer is charged.
- For distances between 16 and 35 kilometers, an additional ₹13 per kilometer is charged.
- For distances beyond 35 kilometers, an additional ₹15 per kilometer is charged.

Java Code:

```
import java.util.Scanner;

/**

 * This program calculates the fare depending on the distance travelled based on the slab defined.

 * upto 5  km = Rs.50.

 * next 10 km = Rs.12/km.

 * next 20 km = Rs.13/km.

 * further distance=Rs.15/km

 *

 * @author (Allen Thomas.M)

 * @author email (allenthomasmuttikal@gmail.com)

 * @author git(https://github.com/allenthomasmuttikal/Java_Project)

 * @version (v1.0)

 */
```

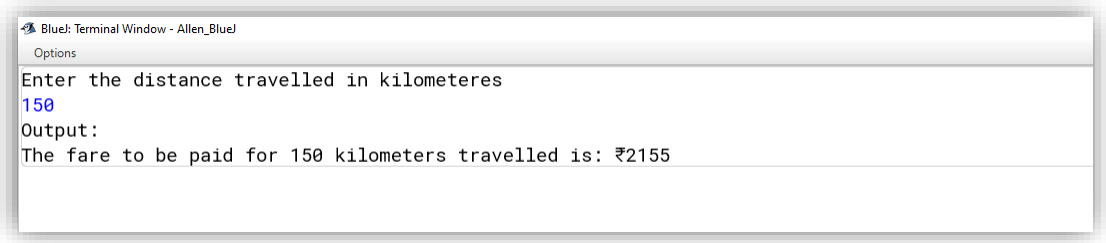
```
public class Kilometres
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter the distance travelled in kilometeres");
```

```
        int dist = ob.nextInt();
        int fare = 0;
        if(dist <= 5)
        fare = 50;
        else if(dist > 5 && dist <= 15)
        fare = 50 + 12 * (dist-5);
        else if(dist > 15 && dist <= 35)
        fare = 50 + (12*10) + 13 * (dist-15);
        else
        fare = 50 + (12*10) + (13*20) + 15 * (dist-35);
        System.out.println("Output:");
        System.out.println("The fare to be paid for "+dist+" kilometers travelled is: \u20B9"+fare);
    }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
dist	int	Stores the total distance travelled in kilometres entered by the user.
fare	int	Stores the calculated fare based on the distance slab logic.

Output:


BlueJ: Terminal Window - Allen_BlueJ
Options
Enter the distance travelled in kilometeres
150
Output:
The fare to be paid for 150 kilometers travelled is: ₹2155

Program-14

Program Name: Electricity

Problem Statement: Develop a Java program to calculate the electricity bill for a consumer based on their energy consumption.

- For the first 100 units, charge ₹1.25 per unit.
- For the next 100 units (101-200), charge ₹1.50 per unit.
- For any units above 200, charge ₹1.80 per unit.

Java Code:

```
import java.util.Scanner;
/**
* This program calculates and displays the Electricity Bill amount based on the consumption.
* Note: Units Consumed upto 100 is charged 1.25 Rs/Unit
*      Units consumed abouve 100 units but below 201 units is charged 1.5 Rs/Unit
*      Units above 200 are charged at 1.8 Rs/Unit
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
public class Electricity
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter Consumer Name");
      String name = ob.nextLine();
      System.out.println("Enter Consumer Number");
```

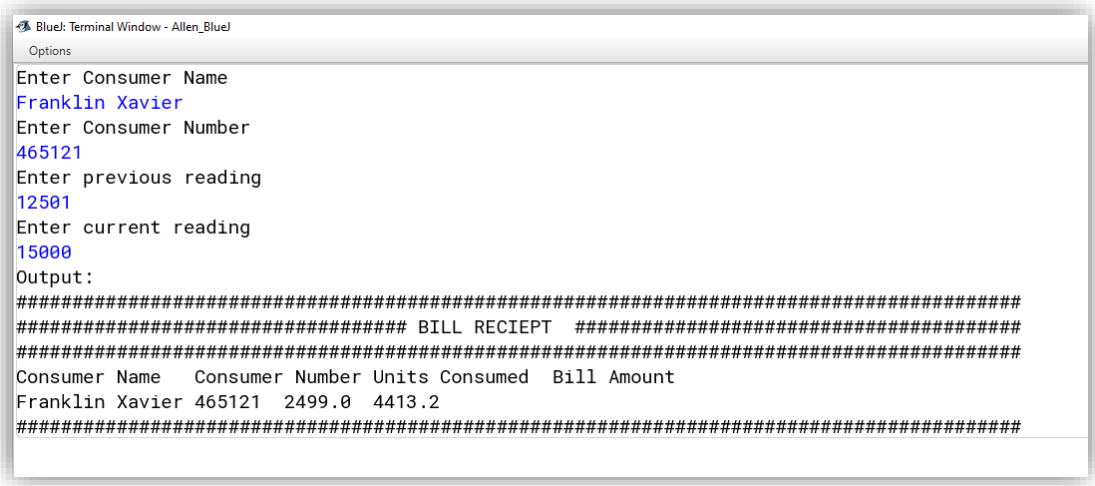
```
int num = ob.nextInt();
System.out.println("Enter previous reading");
double pre_read = ob.nextDouble();
System.out.println("Enter current reading");
double cur_read = ob.nextInt();
double units_consumed = cur_read - pre_read;
double bill = 0.0d;
if(units_consumed <= 100.0)
{
  bill = 1.25 * units_consumed;
}
else if(units_consumed > 100.0 && units_consumed <= 200)
bill=(1.25*100.0) + 1.50 * (units_consumed-100);
else
bill=(1.25*100.0) + (1.50*100.0) + 1.80 * (units_consumed-200);
System.out.println("Output:");

System.out.println("##############################################
##########################################");
    System.out.println("################################### BILL
RECIEPT  ##########################################");

System.out.println("##############################################
##########################################");
    System.out.println("Consumer Name\tConsumer Number\tUnits
Consumed\tBill Amount");
    System.out.println(name+"\t"+num+"\t"+units_consumed+"\t"+bill);
```

```
System.out.println("##############################################
##########################################");


    }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
name	String	Stores the name of the consumer entered by the user.
num	int	Stores the consumer number entered by the user.
pre_read	double	Stores the previous electricity meter reading entered by the user.
cur_read	double	Stores the current electricity meter reading entered by the user.
units_consumed	double	Stores the calculated units consumed by subtracting pre_read from cur_read.
bill	double	Stores the calculated electricity bill amount based on the consumption slabs.

Output:


BlueJ: Terminal Window - Allen_BlueJ
Options
Enter Consumer Name
Franklin Xavier
Enter Consumer Number
465121
Enter previous reading
12501
Enter current reading
15000
Output:
##
################################### BILL RECIEPT ##
##
Consumer Name   Consumer Number Units Consumed Bill Amount
Franklin Xavier 465121 2499.0 4413.2
##

Program-15

Program Name: Salary

Problem Statement: Design a Java program to calculate specific deductions and allowances based on an employee's basic salary.

- Provident Fund deduction (12% of basic salary).
- Education Allowance (20% of basic salary).
- House Rent Allowance (HRA) (10% of basic salary).

Java Code:

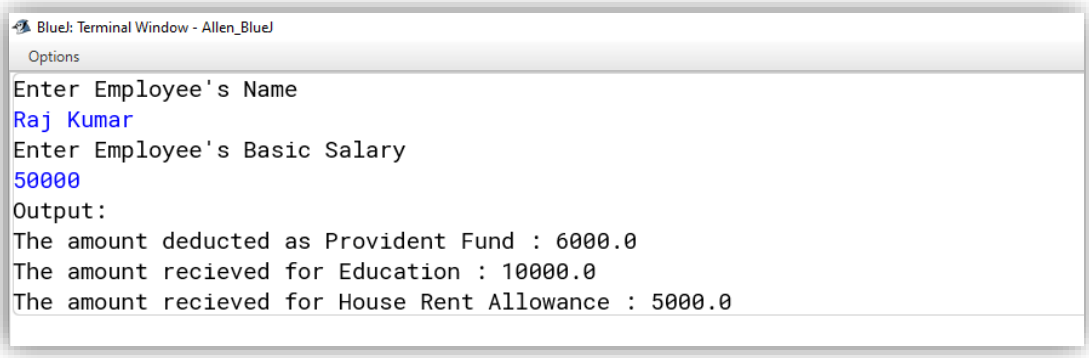
```
import java.util.Scanner;
/**
* This program calculates and displays the PF deducted and amount recieved as HRA and EDU.
* Based on basic salary of the Employee
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
public class Salary
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter Employee's Name");
      String name = ob.nextLine();
      System.out.println("Enter Employee's Basic Salary");
      double basic_pay = ob.nextDouble();
      double pf = (12.0/100.0) * basic_pay;
```

```
        double edu = (20.0/100.0) * basic_pay;
        double hra = (10.0/100.0) * basic_pay;
        System.out.println("Output:");
        System.out.println("The amount deducted as Provident Fund : "+pf);
        System.out.println("The amount recieved for Education : "+edu);
        System.out.println("The amount recieved for House Rent Allowance : "+hra);
    }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
name	String	Stores the name of the employee entered by the user.
basic_pay	double	Stores the basic salary of the employee entered by the user.
pf	double	Stores the calculated amount deducted as Provident Fund.
edu	double	Stores the calculated amount received for Education Allowance.
hra	double	Stores the calculated amount received for House Rent Allowance.

Output:


BlueJ: Terminal Window - Allen_BlueJ
Options
Enter Employee's Name
Raj Kumar
Enter Employee's Basic Salary
50000
Output:
The amount deducted as Provident Fund : 6000.0
The amount recieved for Education : 10000.0
The amount recieved for House Rent Allowance : 5000.0

Program-16

Program Name: Basic_Pay

Problem Statement: Develop a Java program to compute and display an employee's salary breakdown.

- Provident Fund (PF): 12.5% of the basic salary.
- Dearness Allowance (DA): 30% of the basic salary.
- House Rent Allowance (HRA): 15% of the basic salary.
- Gross Salary: Sum of the basic salary, DA, and HRA.
- Net Salary: Gross salary minus the PF deduction.

Java Code:

```
import java.util.Scanner;
/**
 * This program calculates and displays the Dearness Allowance,House Rent Allowance,Gross Salary,Provident Fund deducted and Net Salary.
 * Based on the Basic Salary of the Employee
 *
 * @author (Allen Thomas.M)
 * @author email (allenthomasmuttikal@gmail.com)
 * @author git(https://github.com/allenthomasmuttikal/Java_Project)
 * @version (v1.0)
 */
public class Basic_Pay
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter Employee's Name");
      String name = ob.nextLine();
      System.out.println("Enter Employee's Basic Salary");
```

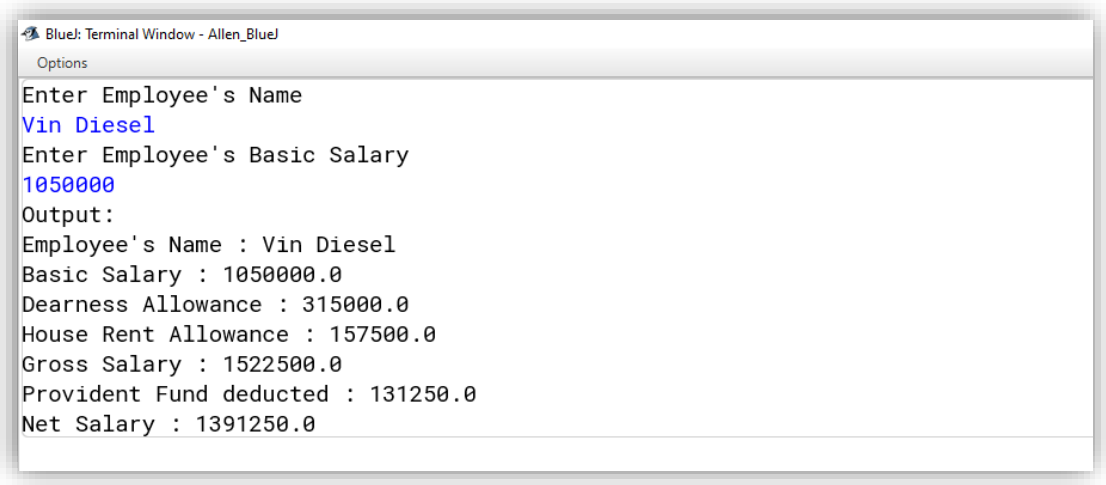
```
        double basic_pay = ob.nextDouble();
        double pf = (12.5/100.0) * basic_pay;
        double da = (30.0/100.0) * basic_pay;
        double hra = (15.0/100.0) * basic_pay;
        double gross=basic_pay+da+hra;
        double net=gross-pf;
        System.out.println("Output:");
        System.out.println("Employee's Name : "+name);
        System.out.println("Basic Salary : "+basic_pay);
        System.out.println("Dearness Allowance : "+da);
        System.out.println("House Rent Allowance : "+hra);
        System.out.println("Gross Salary : "+gross);
        System.out.println("Provident Fund deducted : "+pf);
        System.out.println("Net Salary : "+net);
    }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
name	String	Stores the name of the employee entered by the user.
basic_pay	double	Stores the basic salary of the employee entered by the user.
pf	double	Stores the calculated amount deducted as Provident Fund.
da	double	Stores the calculated Dearness Allowance.

Variable Name	Variable Datatype	Variable Description
hra	double	Stores the calculated House Rent Allowance.
gross	double	Stores the calculated Gross Salary by summing basic pay, DA, and HRA.
net	double	

Output:



Program-17

Program Name: DAYS

Problem Statement: Develop a Java program to convert a given number of days into its equivalent representation in years, months, and remaining days.

- The number of complete years.
- The number of complete months (remaining after computing years).
- The remaining days (after computing both years and months).

Java Code:

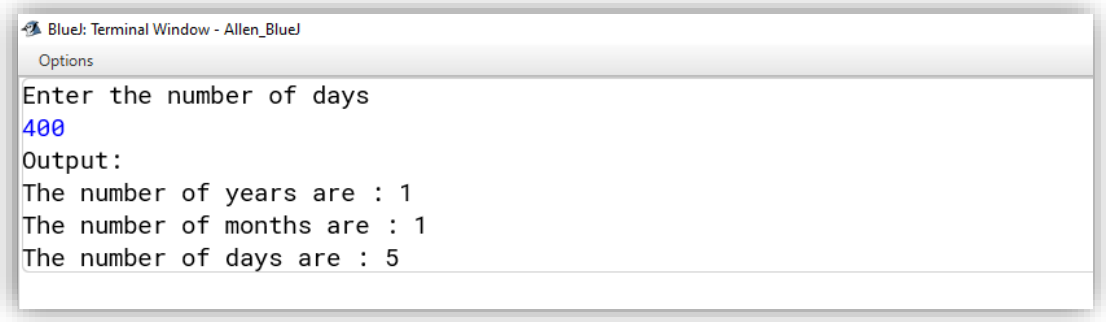
```
import java.util.Scanner;
/**
* This program calculates and displays the number of years,months and days based on the number of days entered.
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
public class DAYS
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter the number of days");
      int days = ob.nextInt();
      int year = days/365;
      int months = (days%365) / 30;
      int D = (days%365) % 30;
      System.out.println("Output:");
```

```
        System.out.println("The number of years are : "+year);
        System.out.println("The number of months are : "+months);
        System.out.println("The number of days are : "+D);
    }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
days	int	Stores the total number of days entered by the user.
year	int	Stores the calculated number of years derived from days.
months	int	Stores the calculated number of months derived from days.
D	int	Stores the remaining number of days after years and months are calculated.

Output:



Program-18

Program Name: Interest

Problem Statement: Design a Java program to calculate and compare Simple Interest (SI) and Compound Interest (CI) for a given principal amount, rate of interest, and duration in years.

Java Code:

```
import java.util.Scanner;
/**
* This program calculates and displays the Simple Interest,Compound Interest and the Difference between the two.
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
public class Interest
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter the principal");
      double P = ob.nextDouble();
      System.out.println("Enter the rate of interest");
      double R = ob.nextDouble();
      System.out.println("Enter the duration in years");
      double D = ob.nextDouble();
      double SI = (P*R*D) / 100.0;
```

```
        double A = P * Math.pow((1+R / 100.0), D);
        double CI = A - P;
        double DIFF = CI - SI;
        System.out.println("Output:");
        System.out.println("The Simple Interest is : "+SI);
        System.out.println("The Compound Interest is : "+CI);
        System.out.println("The Difference between Simple and Compound Interest is :
"+DIFF);
    }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
P	double	Stores the principal amount entered by the user.
R	double	Stores the rate of interest entered by the user.
D	double	Stores the duration in years entered by the user.
SI	double	Stores the calculated Simple Interest using the formula (P·R·D)/100(P \cdot R \cdot D) / 100.
A	double	Stores the accumulated amount using the formula P·(1+R/100)DP \cdot (1 + R / 100)^D.
CI	double	Stores the calculated Compound Interest as the difference between A and P.
DIFF	double	Stores the difference between Compound Interest (CI) and Simple Interest (SI).

Output:


BlueJ: Terminal Window - Allen_BlueJ
Options
Enter the principal
5000
Enter the rate of interest
10
Enter the duration in years
3
Output:
The Simple Interest is : 1500.0
The Compound Interest is : 1655.0000000000018
The Difference between Simple and Compound Interest is : 155.00000000000182

Program-19

Program Name: Grades

Problem Statement: Develop a Java program that evaluates a student's academic performance based on their marks in Physics, Chemistry, and Biology.

- Distinction: Average percentage >= 80%.
- First Division: Average percentage between 60% and 79%.
- Second Division: Average percentage between 45% and 59%.
- Passed: Average percentage between 40% and 44%.
- Promotion Not Granted: Average percentage below 40%.

Java Code:

```
import java.util.Scanner;
/**
* This program calculates and displays the grade and average percentage recieved by student in PCB
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
public class Grades
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter Student's Name");
      String name = ob.nextLine();
      System.out.println("Enter Student's marks in Physics, Chemistry and Biology");
      double p = ob.nextDouble();
```

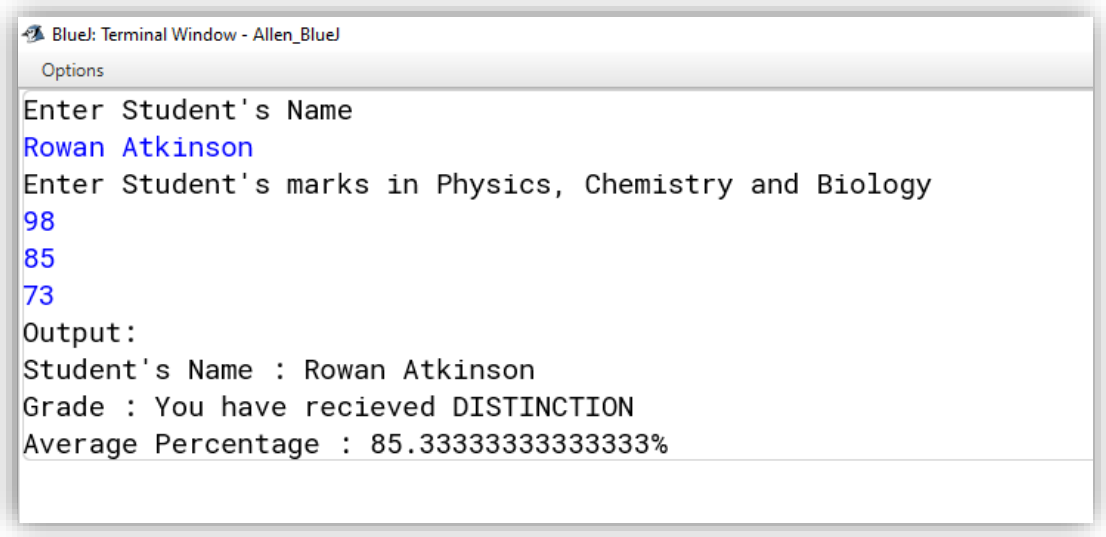
```
        double c = ob.nextDouble();
        double b = ob.nextDouble();
        double avg = (p+c+b) / 3;
        System.out.println("Output:");
        System.out.println("Student's Name : "+name);
        if(avg >= 80)
        System.out.println("Grade : You have recieved DISTINCTION");
        else if(avg >= 60 && avg < 80)
        System.out.println("Grade : You have recieved FIRST DIVISION");
        else if(avg >= 45 && avg < 60)
        System.out.println("Grade : You have recieved SECOND DIVISION");
        else if(avg >= 40 && avg < 45)
        System.out.println("Grade : You have PASSED");
        else
        System.out.println("Grade : PROMOTION NOT GRANTED");
        System.out.println("Average Percentage : "+avg+"%");
    }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
name	String	Stores the name of the student entered by the user.
p	double	Stores the marks obtained by the student in Physics.
c	double	Stores the marks obtained by the student in Chemistry.

Variable Name	Variable Datatype	Variable Description
b	double	Stores the marks obtained by the student in Biology.
avg	double	Stores the calculated average percentage of marks across Physics, Chemistry, and Biology.

Output:



Program-20

Program Name: Electronics_World

Problem Statement: Create a Java program to calculate the total amount payable for the purchase of either an air-conditioner or an LCD TV.

Based on the product choice and the purchase amount, compute the following:

- Discount: A varying percentage discount based on slabs specific to each product.
- Retail Price: The purchase amount minus the discount.
- Tax: A fixed rate of 12.5% on the retail price.
- Total Payable Amount: The sum of retail price and tax.

Java Code:

```
import java.util.Scanner;
/**
 * This program calculates and displays the Recipt Slip for Purchase of Electronics Goods (Air-Conditioner / LCD Tv).
 * The Net Cost for the product depends on the Discount obtained based on the Purchase Price and Tax.
 *
 * @author (Allen Thomas.M)
 * @author email (allenthomasmuttikal@gmail.com)
 * @author git(https://github.com/allenthomasmuttikal/Java_Project)
 * @version (v1.0)
 */
public class Electronics_World
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
```

```
System.out.println("Enter Consumer Name");
String name = ob.nextLine();
System.out.println("The Choices are Air-Conditioner and LCD Tv.\nEnter:\n1. for Air-Conditioner\n2. for LCD Tv");
int choice = ob.nextInt();
double purchase = 0.0d;
double discount = 0.0d;
double retail_price = 0.0d;
double tax = 0.0d;
double payable_amt = 0.0d;

if(choice == 1)
{
   System.out.println("Enter amount of Air-Conditioner");
   purchase = ob.nextDouble();
   if(purchase <= 20000)
   discount = purchase*5.0/100.0;
   else if(purchase > 20000 && purchase <= 40000)
   discount = purchase * (7.5/100.0);
   else if(purchase > 40000 && purchase <= 60000)
   discount = purchase * (10.0/100.0);
   else
   discount = purchase * (12.0/100.0);

   retail_price = purchase-discount;
   tax = retail_price * (12.5/100.0);
   payable_amt = retail_price + tax;
```

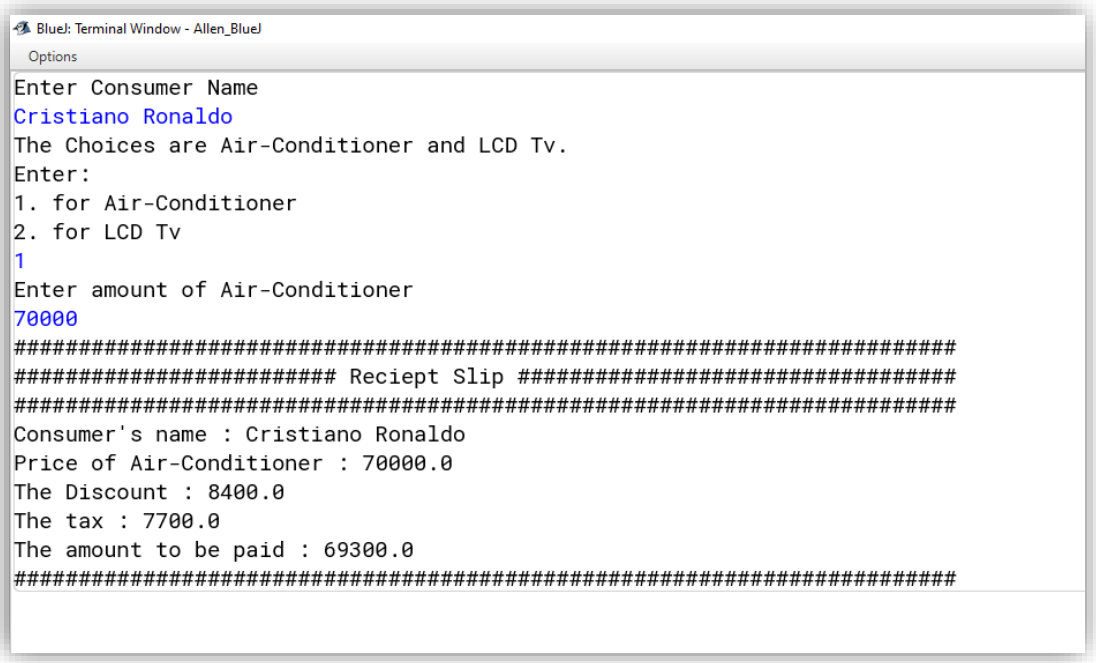
```
System.out.println("##############################################
############################");
        System.out.println("########################## Reciept Slip
##################################");

System.out.println("##############################################
############################");


        System.out.println("Consumer's name : "+name);
        System.out.println("Price of Air-Conditioner : "+purchase);
        System.out.println("The Discount : "+discount);
        System.out.println("The tax : "+tax);
        System.out.println("The amount to be paid : "+payable_amt);

System.out.println("##############################################
############################");
    }
    else if (choice == 2)
    {
       System.out.println("Enter amount of LCD Tv");
       purchase = ob.nextDouble();
       if(purchase <= 20000)
       discount = purchase * (2.5/100.0);
       else if(purchase > 20000 && purchase <= 40000)
       discount = purchase * (5.0/100.0);
       else if(purchase > 40000 && purchase <= 60000)
       discount = purchase * (7.0/100.0);
       else
```

```
        discount = purchase * (8.5/100.0);


        retail_price = purchase - discount;
        tax = retail_price * (12.5/100.0);
        payable_amt = retail_price + tax;



System.out.println("##############################################
############################");
        System.out.println("########################## Reciept Slip
##################################");

System.out.println("##############################################
############################");
        System.out.println("Consumer's name : "+name);
        System.out.println("Price of LCD Tv : "+purchase);
        System.out.println("The Discount : "+discount);
        System.out.println("The tax : "+tax);
        System.out.println("The amount to be paid : "+payable_amt);

System.out.println("##############################################
############################");
      }
      else
        System.out.println("Invalid Choice");
   }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
name	String	Stores the name of the consumer entered by the user.
choice	int	Stores the choice input by the user to select between Air-Conditioner and LCD Tv.
purchase	double	Stores the purchase amount of the selected product.
discount	double	Stores the calculated discount based on the purchase amount and product type.
retail_price	double	Stores the price of the product after applying the discount.
tax	double	Stores the calculated tax on the discounted price.
payable_amt	double	Stores the total amount to be paid including tax after discount.

Output:


BlueJ: Terminal Window - Allen_BlueJ
Options
Enter Consumer Name
Cristiano Ronaldo
The Choices are Air-Conditioner and LCD Tv.
Enter:
1. for Air-Conditioner
2. for LCD Tv
1
Enter amount of Air-Conditioner
70000
##
######################## Reciept Slip ##################################
##
Consumer's name : Cristiano Ronaldo
Price of Air-Conditioner : 70000.0
The Discount : 8400.0
The tax : 7700.0
The amount to be paid : 69300.0
##

.

Program-21

Program Name: Switch_Case_1

Problem Statement: Design a Java program that offers three distinct functionalities based on user selection using a switch-case construct:

1. Calculate and display the square root of a user-provided number.
2. Compare two user-provided numbers and display the larger of the two.
3. Calculate and display the area of a circle based on a user-provided radius.

Java Code:

```
import java.util.Scanner;
/**
* This program calculates and displays various tasks based on the user's choice.
* The 3 options are:
* 1.square root of a number
* 2.largest of any 2 numbers
* 3.area of a circle
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
public class Switch_Case_1
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter 1 to find the square root of a number");
      System.out.println("Enter 2 to find the largest of any 2 numbers");
```

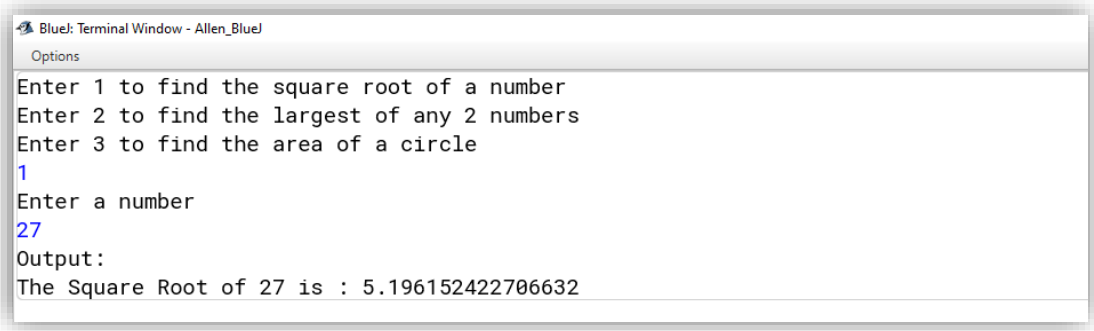
```
System.out.println("Enter 3 to find the area of a circle");
int choice = ob.nextInt();
switch(choice)
{
   case 1:System.out.println("Enter a number");
          int a = ob.nextInt();
          System.out.println("Output:");
          System.out.println("The Square Root of "+a+" is : "+Math.sqrt(a));
          break;

   case 2:System.out.println("Enter any 2 numbers");
          int b = ob.nextInt();
          int c = ob.nextInt();
          System.out.println("Output:");
          if(b > c)
          System.out.println(b+" is greater than "+c);
          else
          System.out.println(c+" is greater than "+b);
          break;

    case 3:System.out.println("Enter the radius");
           double radius = ob.nextDouble();
           double pi = 3.14d;
           double area = pi * radius * radius;
           System.out.println("Output:");
           System.out.println("The area of  circle with radius "+radius+" is : "+area);
           break;
```

```
            default:System.out.println("Invalid Input");
        }
    }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
choice	int	Stores the user's choice of task (square root, largest number, or circle area).
a	int	Stores the number input for calculating the square root.
b	int	Stores the first number input for comparing two numbers.
c	int	Stores the second number input for comparing two numbers.
radius	double	Stores the radius of the circle input by the user.
pi	double	Stores the constant value of π (3.14) used for calculating the area of the circle.
area	double	Stores the calculated area of the circle using the formula π·radius2π \cdot \text{radius}^2.

Output:


BlueJ: Terminal Window - Allen_BlueJ
Options
Enter 1 to find the square root of a number
Enter 2 to find the largest of any 2 numbers
Enter 3 to find the area of a circle
1
Enter a number
27
Output:
The Square Root of 27 is : 5.196152422706632

Program-22

Program Name: Switch_Case_2

Problem Statement: Develop a Java program that allows the user to choose between various functionalities using a menu-driven system implemented with switch-case statements. The program should prompt the user to select one of the following options:

1. Print numbers from 1 to 10.
2. Print numbers from 10 to 1.
3. Reverse a given number and display it.
4. Count and display the number of digits in a given number.
5. Calculate and display the sum of the digits of a given number.
6. Calculate and display the factorial of a given number.

Java Code:

```
import java.util.Scanner;
/**
*This program calculates and displays various tasks based on the user's choice.
* The 6 options are:
* 1.print numbers from 1-10
* 2.print numbers from 10-1
* 3.flip/reverse a number
* 4.count and display the number of digits in a number
* 5.find and display the sum of the digits of a number
* 6.find and display the factorial of a number
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
```

```
public class Switch_Case_2
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter 1 to print numbers from 1-10");
      System.out.println("Enter 2 to print numbers from 10-1");
      System.out.println("Enter 3 to flip/reverse a number");
      System.out.println("Enter 4 to count and display the number of digits in a
number");
      System.out.println("Enter 5 to find and display the sum of the digits of a
number");
      System.out.println("Enter 6 to find and display the factorial of a number");
      int choice = ob.nextInt();
      switch(choice)
      {
         case 1: int a = 1;
               System.out.println("Output:");
               while(a <= 10)
               {
                  System.out.println(a);
                  a++;
               }
               break;

         case 2: int b = 10;
               System.out.println("Output:");
```

```
        while(b >= 1)
        {
           System.out.println(b);
           b--;
        }
        break;

case 3: System.out.println("Enter a number");
        int num = ob.nextInt();
        System.out.println("Output:");
        System.out.println("The reversed number of "+num+" is : ");
        while(num != 0)
        {
           int c = num % 10;
           System.out.print(c);
           num /= 10;
        }
        break;

case 4: System.out.println("Enter a number");
        int number = ob.nextInt();
        int temp = number;
        int count = 0;
        System.out.println("Output:");
        while(number != 0)
        {
           count++;
```

```
        number /= 10;
    }
    System.out.println("The number of digits in "+temp+" is : "+count);
    break;

case 5: System.out.println("Enter a number");
    int n = ob.nextInt();
    int j = n;
    int sum = 0;
    while(n != 0)
    {
        sum += n % 10;
        n /= 10;
    }
    System.out.println("Output:");
    System.out.println("The sum of the digits in "+j    +" is : "+sum);
    break;

case 6: System.out.println("Enter a number");
    int d = ob.nextInt();
    long factorial = 1;
    int i = 1;
    while(i <= d)
    {
        factorial *= i;
        i++;
    }
```

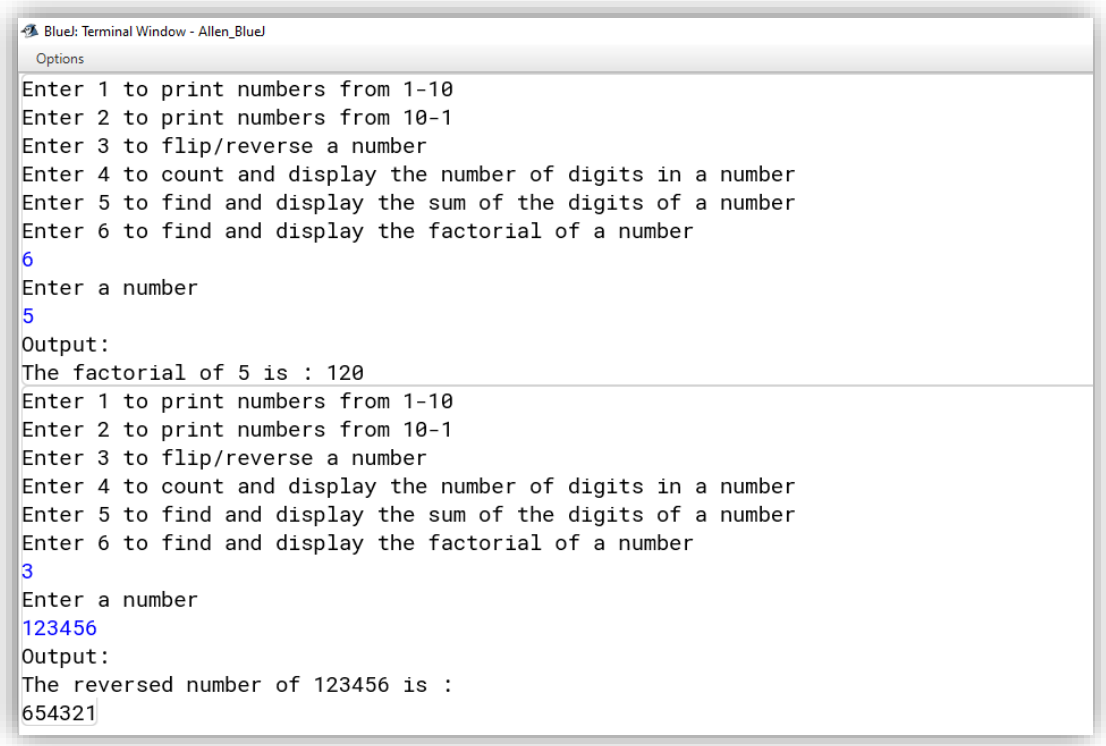
```
            System.out.println("Output:");
            System.out.println("The factorial of "+d+" is : "+factorial);
            break;
        default:System.out.println("Invalid Input");
      }
   }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
choice	Int	Stores the user's choice of task (1–6 options).
a	Int	Stores the current number in the range 1–10 for printing.
b	Int	Stores the current number in the range 10–1 for printing.
num	Int	Stores the number input by the user for reversing.
c	Int	Stores individual digits during the reversal of num.
number	Int	Stores the number input by the user for digit counting.
temp	Int	Stores the original value of number for display purposes.
count	Int	Stores the count of digits in the input number.
n	Int	Stores the number input by the user for summing its digits.

Variable Name	Variable Datatype	Variable Description
j	Int	Stores the original value of n for display purposes.
sum	Int	Stores the sum of the digits of the input number n.
d	Int	Stores the number input by the user for factorial calculation.
factorial	Long	Stores the calculated factorial of the input number d.
i	Int	Loop counter variable for factorial calculation.

Output:



Program-23

Program Name: Switch_Case_3

Problem Statement: Develop a menu-driven Java program that allows users to check for specific mathematical properties of numbers. The program should prompt the user to select one of the following options:

1. Check if a number is a Palindrome Number.
2. Check if a number is an Armstrong Number.
3. Check if a number is a Prime Number.
4. Check if a number is a Perfect Number.
5. Check if a number is a Harshad Number.
6. Check if a number is a Kaprekar Number.
7. Check if a number is an Automorphic Number.

Java Code:

```
import java.util.Scanner;
/**
* This program calculates and displays various tasks based on the user's choice.
* There are a total of 7 different choices
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
public class Switch_Case_3
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
```

```
System.out.println("Enter 1 to check if a number is a  Palindrome Number");
System.out.println("Enter 2 to check if a number is an Armstrong Number");
System.out.println("Enter 3 to check if a number is a Prime Number");
System.out.println("Enter 4 to check if a number is a Perfect Number");
System.out.println("Enter 5 to check if a number is a Harshad  Number");
System.out.println("Enter 6 to check if a number is a Kaprekar Number");
System.out.println("Enter 7 to check if a number is an Automorphic Number");
int choice = ob.nextInt();
switch(choice)
{
   case 1: System.out.println("Enter a number");
           int num = ob.nextInt();
           int temp = num;
           int reverse = 0;
           System.out.println("Output:");
           while(temp != 0)
           {
              int r = temp % 10;
              reverse = reverse * 10 + r;
              temp /= 10;
           }
           if(num == reverse)
           System.out.println(num+" is a Palindrome Number");
           else
           System.out.println(num+" is not a Palindrome Number");
           break;
```

```
case 2: System.out.println("Enter a number");
        int number = ob.nextInt();
        int tem = number;
        int rem = 0;
        int sum = 0;
        System.out.println("Output:");
        while(tem != 0)
        {
           rem = tem % 10;
           sum += (int)Math.pow(rem,3);
           tem /= 10;
        }
        if(sum == number)
        System.out.println(number+" is an Armstrong Number");
        else
        System.out.println(number+" is not an Armstrong Number");
        break;

case 3: System.out.println("Enter a number");
        int n = ob.nextInt();
        int i = 1;
        int count = 0;
        System.out.println("Output:");
        while(i <= n)
        {
           if(n % i == 0)
           count++;
```

```
        i++;
      }
      if(count == 2)
      System.out.println(n+" is a Prime Number");
      else
      System.out.println(n+" is not a Prime Number");
      break;

case 4: System.out.println("Enter a number");
      int a = ob.nextInt();
      int s = 0;
      int j = 1;
      System.out.println("Output:");
      while(j < a)
      {
        if(a % j == 0)
        s+=j;
        j++;
      }
      if(s == a)
      System.out.println(a+" is a Perfect Number");
      else
      System.out.println(a+" is not a Perfect Number");
      break;

case 5: System.out.println("Enter a number");
      int b = ob.nextInt();
```

```
        int t = b;
        int remainder = 0;
        int summation = 0;
        System.out.println("Output:");
        while(t != 0)
        {
          remainder = t % 10;
          summation+=remainder;
          t /= 10;
        }
        if(b % summation == 0)
        System.out.println(b+" is a Harshad Number");
        else
        System.out.println(b+" is not a Harshad Number");
        break;

case 6: System.out.println("Enter a number");
        int c = ob.nextInt();
        int tempor = c;
        int add = 0; int first = 0; int second = 0; int tally = 0; int square = 0;
        while(tempor != 0)
        {
           tally++;
           tempor /= 10;
        }
        square = c * c;
        first = square / (int)Math.pow(10,tally);
```

```
        second = square % (int)Math.pow(10,tally);
        add = first + second;
        System.out.println("Output:");
        if(c == add)
        System.out.println(c+" is a Kaprekar Number");
        else
        System.out.println(c+" is not a Kaprekar Number");
        break;

case 7: System.out.println("Enter a number");
        int d = ob.nextInt();
        int sq = 0; int temporary = d; int reckon = 0; int last = 0;
        while(temporary != 0)
        {
           reckon++;
           temporary /= 10;
        }
        sq = d * d;
        System.out.println("The square value of "+d+" is : "+sq);
        last = sq % (int)Math.pow(10,reckon);
        System.out.println("Output:");
        if(d == last)
        System.out.println(d+" is an Automorphic Number");
        else
        System.out.println(d+" is not an Automorphic Number");
        break;
default:System.out.println("Invalid Input");
```

```
        }
    }
}
```

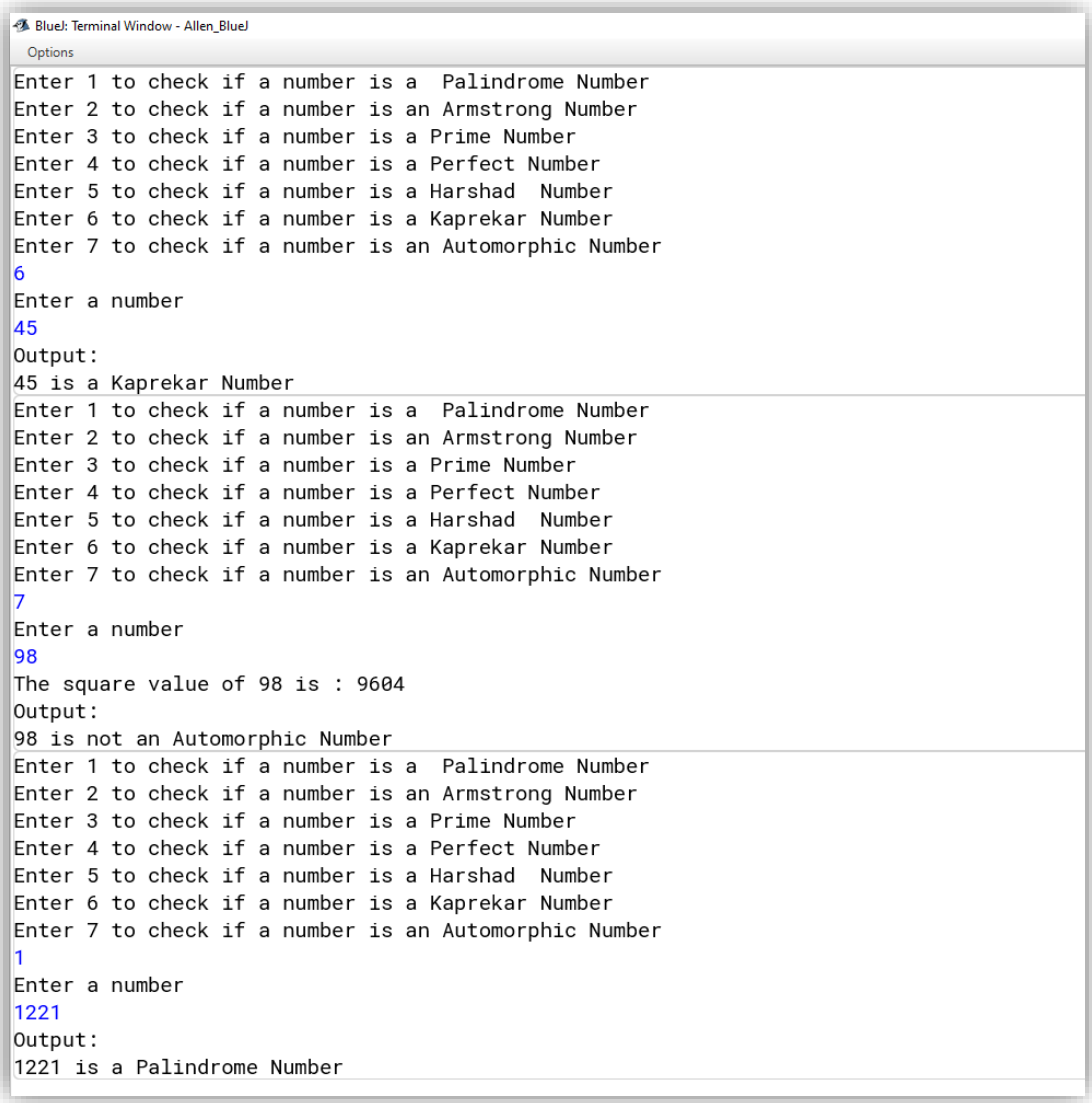
Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
choice	Int	Stores the user's choice to execute one of the seven tasks (e.g., Palindrome check, Armstrong number, etc.).
num	Int	Stores the number input by the user for checking if it is a Palindrome.
temp	Int	Temporarily holds the value of num during processing.
reverse	Int	Stores the reversed version of the number for Palindrome check.
r	Int	Stores the remainder during the reversal of a number.
number	Int	Stores the number input by the user for Armstrong number check.
tem	Int	Temporarily holds the value of number during processing for Armstrong number.
rem	Int	Stores the remainder during the calculation of Armstrong number.
sum	Int	Stores the sum of the digits raised to the power three for Armstrong number check.
n	Int	Stores the number input by the user for Prime number check.
i	Int	Loop counter for checking the factors of n in Prime number determination.

Variable Name	Variable Datatype	Variable Description
count	Int	Counts the number of factors for Prime number determination.
a	Int	Stores the number input by the user for Perfect number check.
s	Int	Stores the sum of divisors of a for Perfect number determination.
j	Int	Loop counter for summing up divisors of a.
b	Int	Stores the number input by the user for Harshad number check.
t	Int	Temporarily holds the value of b during processing for Harshad number check.
remainder	Int	Stores the remainder during digit summation for Harshad number check.
summation	Int	Stores the sum of the digits of b for Harshad number check.
c	Int	Stores the number input by the user for Kaprekar number check.
tempor	Int	Temporarily holds the value of c during processing for Kaprekar number check.
add	Int	Stores the sum of the split parts of the squared number for Kaprekar number check.
first	Int	Stores the first part of the squared number in Kaprekar number check.
second	Int	Stores the second part of the squared number in Kaprekar number check.
tally	Int	Counts the number of digits in the number c for Kaprekar number check.
square	Int	Stores the square of the number c for Kaprekar number check.

Variable Name	Variable Datatype	Variable Description
d	Int	Stores the number input by the user for Automorphic number check.
sq	Int	Stores the square of d for Automorphic number check.
temporary	Int	Temporarily holds the value of d during processing for Automorphic number check.
reckon	Int	Counts the number of digits in the number d for Automorphic number check.
last	Int	Stores the last part of the squared number to compare with d in Automorphic number check.

Output:


BlueJ: Terminal Window - Allen_BlueJ
Options
Enter 1 to check if a number is a Palindrome Number
Enter 2 to check if a number is an Armstrong Number
Enter 3 to check if a number is a Prime Number
Enter 4 to check if a number is a Perfect Number
Enter 5 to check if a number is a Harshad Number
Enter 6 to check if a number is a Kaprekar Number
Enter 7 to check if a number is an Automorphic Number
6
Enter a number
45
Output:
45 is a Kaprekar Number
Enter 1 to check if a number is a Palindrome Number
Enter 2 to check if a number is an Armstrong Number
Enter 3 to check if a number is a Prime Number
Enter 4 to check if a number is a Perfect Number
Enter 5 to check if a number is a Harshad Number
Enter 6 to check if a number is a Kaprekar Number
Enter 7 to check if a number is an Automorphic Number
7
Enter a number
98
The square value of 98 is : 9604
Output:
98 is not an Automorphic Number
Enter 1 to check if a number is a Palindrome Number
Enter 2 to check if a number is an Armstrong Number
Enter 3 to check if a number is a Prime Number
Enter 4 to check if a number is a Perfect Number
Enter 5 to check if a number is a Harshad Number
Enter 6 to check if a number is a Kaprekar Number
Enter 7 to check if a number is an Automorphic Number
1
Enter a number
1221
Output:
1221 is a Palindrome Number

Program-24

Program Name: Switch_Case_4

Problem Statement: Develop a menu-driven Java program that performs various operations based on user selection using a switch-case construct. The program should prompt the user to choose one of the following functionalities:

1. Print the factors of a given number.
2. Calculate and display the sum of the factors of a given number.
3. Generate and print the Fibonacci series up to a specified limit.
4. Print all odd numbers up to a specified limit.
5. Print odd numbers in reverse order from 30 to 15.
6. Calculate and display the sum of the digits in odd positions of a given number.

Java Code:

```
import java.util.Scanner;
/**
* This program calculates and displays various tasks based on the user's choice.
* There are a total of 6 choices.
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
public class  Switch_Case_4
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
```

```
System.out.println("Enter 1 to print the factors of a number");
System.out.println("Enter 2 to print the sum of the factors of a number");
System.out.println("Enter 3 to print the fibonacci series till a limit ");
System.out.println("Enter 4 to print the odd numbers till a limit");
System.out.println("Enter 5 to print the odd numbers in the reverse order from 30-15");
System.out.println("Enter 6 to find the sum of the digits in odd positions of a number");
int choice = ob.nextInt();
switch(choice)
{
   case 1: System.out.println("Enter a number");
         int num = ob.nextInt();
         int i = 1;
         System.out.println("Output:");
         while(i <= num)
         {
            if(num % i == 0)
            System.out.println(i);
            i++;
         }
         break;

   case 2: System.out.println("Enter a number");
         int number = ob.nextInt();
         int j = 1; int sum = 0;
         while(j <= number)
```

```
        {
           if(number % j == 0)
           sum+=j;
           j++;
        }
        System.out.println("Output:");
        System.out.println("The sum of the factors of "+number+" is : "+sum);
        break;

case 3: System.out.println("Enter a limit");
        int limit=ob.nextInt();
        int a = 0; int b = 1; int c = 3;
        System.out.println("Output:");
        System.out.print(a+","+b);
        while(c <= limit)
        {
           int d = a + b;
           System.out.print(","+d);
           a = b;
           b = d;
           c++;
        }
        break;

case 4: System.out.println("Enter a limit");
        int lim = ob.nextInt();
        int k = 1;
```

```
        System.out.println("Output:");
        while(k <= lim)
        {
           if(k % 2 != 0)
           System.out.println(k);
           k++;
        }
        break;

case 5: int l = 30;
        int m = 15;
        System.out.println("Output:");
        while(l >= m)
        {
           if(l % 2 != 0)
           System.out.print (l+",");
           l--;
        }
        break;

case 6: System.out.println("Enter a number");
        int e = ob.nextInt();
        int rem = 0;
        int count = 0;
        int temp = e;
        int t = temp;
        int summation = 0;
```

```
            while(temp != 0)
            {
               count++;
               temp /= 10;
            }
            while(e != 0)
            {
               rem = e % 10;
               if(count % 2 != 0)
               summation+=rem;
               e /= 10;
               count--;
            }
            System.out.println("Output:");
            System.out.println("The sum of the digits in odd positions of "+t+" is :
"+summation );
            break;
        default:System.out.println("Invalid Input");
      }
   }
}
```

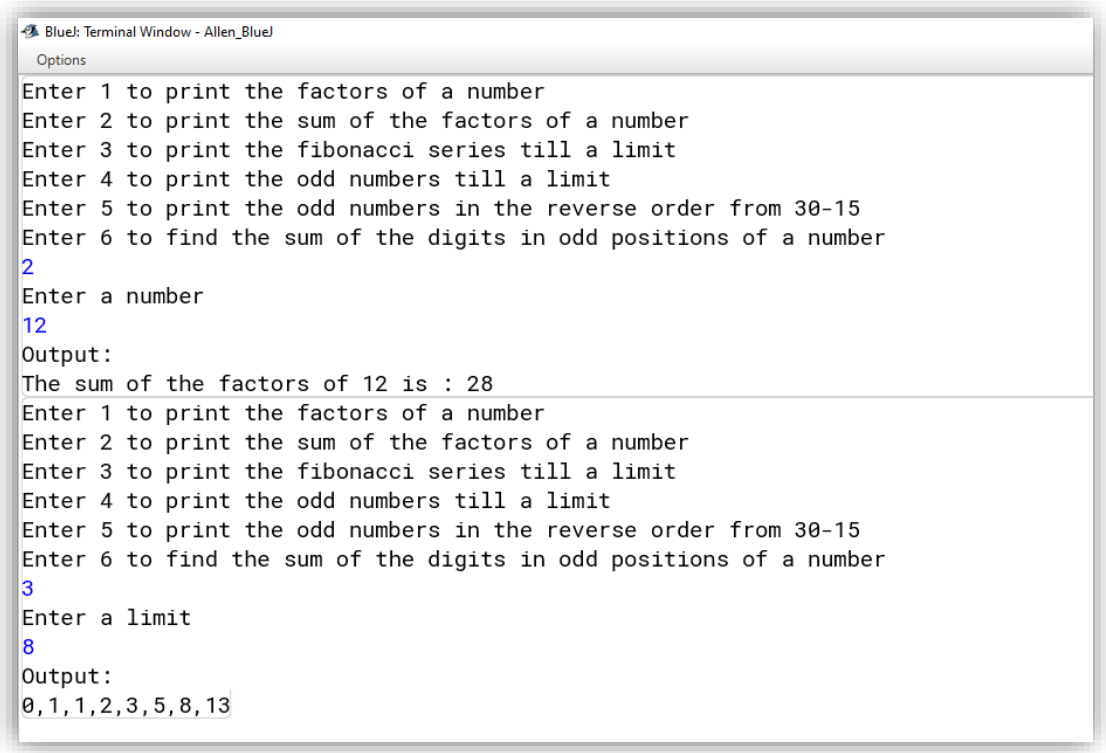
Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
choice	Int	Stores the user's choice for executing one of the six tasks.

Variable Name	Variable Datatype	Variable Description
num	Int	Stores the number input by the user for printing its factors.
i	Int	Loop counter for finding and printing factors of num.
number	Int	Stores the number input by the user for summing its factors.
j	Int	Loop counter for finding factors and summing them for number.
sum	Int	Stores the calculated sum of the factors of number.
limit	Int	Stores the upper limit for generating the Fibonacci series.
a	Int	Stores the first Fibonacci number during series generation.
b	Int	Stores the second Fibonacci number during series generation.
c	Int	Loop counter for generating numbers in the Fibonacci series.
d	Int	Temporarily stores the sum of a and b during Fibonacci generation.
lim	Int	Stores the upper limit for generating odd numbers.
k	Int	Loop counter for printing odd numbers up to lim.
l	Int	Stores the starting value for printing odd numbers in reverse.
m	Int	Stores the ending value for printing odd numbers in reverse.
e	Int	Stores the number input by the user for summing its odd-positioned digits.

Variable Name	Variable Datatype	Variable Description
rem	Int	Stores the remainder during digit extraction from e.
count	Int	Counts the total digits in e to determine their positions.
temp	Int	Temporarily holds the value of e during digit position count.
t	Int	Stores the original value of e for displaying output.
summation	Int	Stores the sum of digits in odd positions of e.

Output:



Program-25

Program Name: Alphabets

Problem Statement:

Java Code:

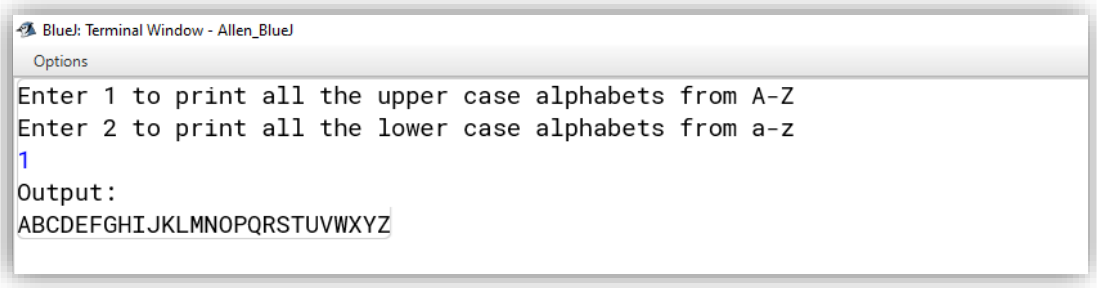
```
import java.util.Scanner;
/**
 * This program displays, either all the upper case(A-Z) or lower case(a-z) alphabets depending on the user's choice.
 *
 * @author (Allen Thomas.M)
 * @author email (allenthomasmuttikal@gmail.com)
 * @author git(https://github.com/allenthomasmuttikal/Java_Project)
 * @version (v1.0)
 */
public class Alphabets
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter 1 to print all the upper case alphabets from A-Z");
      System.out.println("Enter 2 to print all the lower case alphabets from a-z");
      int choice = ob.nextInt();
      switch(choice)
      {
        case 1: int a = 65;
            System.out.println("Output:");
            while(a <= 90)
            {
              System.out.print((char)(a));
```

```
            a++;
          }
          break;

      case 2: int b = 97;
          System.out.println("Output:");
          while(b <= 122)
          {
            System.out.print((char)(b));
            b++;
          }
          break;
      default:System.out.println("Invalid Input");
    }
  }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
choice	int	Stores the user's choice to print either uppercase or lowercase alphabets.
a	int	Stores the ASCII value for uppercase alphabets, iterates from 'A' (65) to 'Z' (90).
b	int	Stores the ASCII value for lowercase alphabets, iterates from 'a' (97) to 'z' (122).

Output:


BlueJ: Terminal Window - Allen_BlueJ
Options
Enter 1 to print all the upper case alphabets from A-Z
Enter 2 to print all the lower case alphabets from a-z
1
Output:
ABCDEFGHIJKLMNOPQRSTUVWXYZ

Program-26

Program Name: Ushwa_Number

Problem Statement: Develop a menu-driven Java program that prints alphabets based on user selection:

- Print all uppercase alphabets from A to Z.
- Print all lowercase alphabets from a to z.

Java Code:

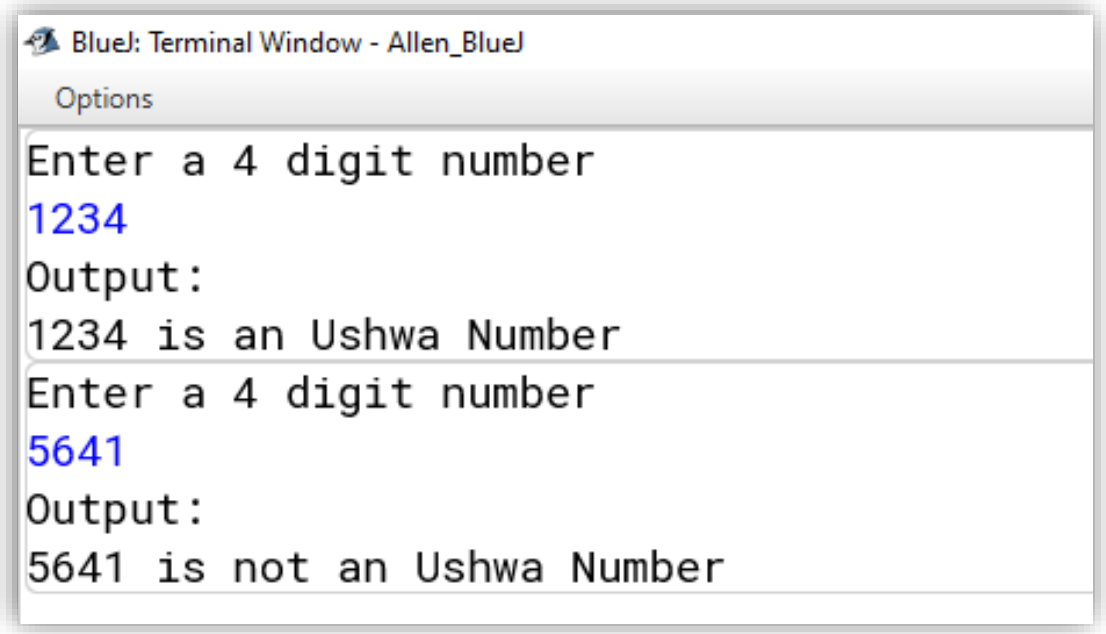
```
import java.util.Scanner;
/**
* This program checks and displays if the entered 4 digit number is an Ushwa Number
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
public class Ushwa_Number
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter a 4 digit number");
      int num = ob.nextInt();
      int number = num;
      int sum = 0;
      while(num != 0)
      {
```

```
        sum += num % 10;
        num /= 10;
    }
    int summation = number % 10 + number / 1000;
    System.out.println("Output:");
    if(2 * summation == sum)
    {
        System.out.println(number+" is an Ushwa Number");
    }
    else
    System.out.println(number+" is not an Ushwa Number");
}
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
num	int	Stores the 4-digit number entered by the user.
number	int	Temporarily holds the original value of num for further calculations and output.
sum	int	Stores the sum of all the digits in the 4-digit number num.
summation	int	Stores the sum of the first and last digits of the number number.

Output:


BlueJ: Terminal Window - Allen_BlueJ
Options
Enter a 4 digit number
1234
Output:
1234 is an Ushwa Number
Enter a 4 digit number
5641
Output:
5641 is not an Ushwa Number

Program-27

Program Name: Days_Months

Problem Statement: Design a Java program to determine the number of days in a given month of a specified year. Using Fall Through condition.

Java Code:

```
import java.util.Scanner;
/**
 * This program is to display the number of days in a month depending on the user's input.
 * It does it through the  Fall Through Condition.
 *
 * NOTE: Fall through condition : This condition occurs in the switch control statement
 * when there is no break keyword mention for the particular case in the switch statement
 * and cause execution of the cases till no break statement occurs or exit from the switch
 * statement. This condition has its own advantage and disadvantage and it totally depends
 * upon the type of operation we want in our program.
 *
 * @author (Allen Thomas.M)
 * @author email (allenthomasmuttikal@gmail.com)
 * @author git(https://github.com/allenthomasmuttikal/Java_Project)
 * @version (v1.0)
 */
public class Days_Months
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter any months number(1-12)");
      int month = ob.nextInt();
      System.out.println("Enter the year");
      int year = ob.nextInt();
```

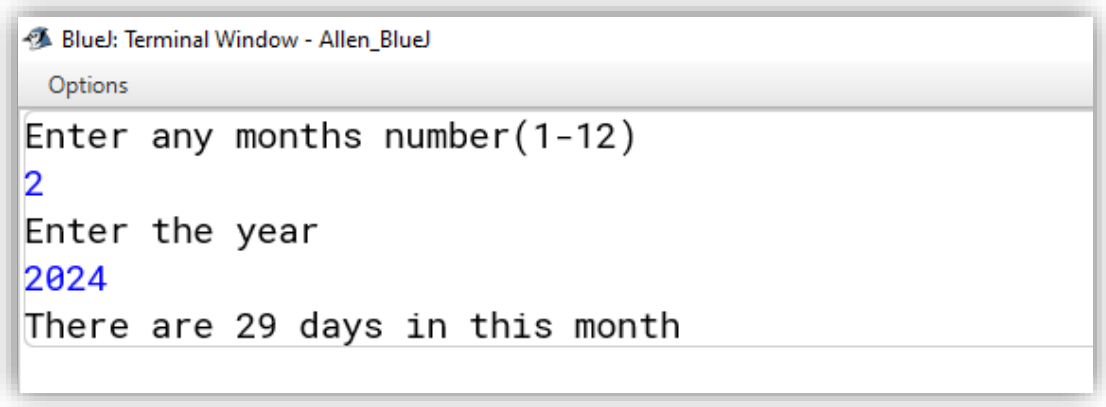
```
    switch(month)
    {
       case 1:
       case 3:
       case 5:
       case 7:
       case 8:
       case 10:
       case 12:System.out.println("There are 31 days in this month");
            break;

       case 4:
       case 6:
       case 9:
       case 11:System.out.println("There are 30 days in this month");
            break;

       case 2: if(year % 400 == 0 && year % 100 == 0)
            System.out.println("There are 29 days in this month");
            else if(year % 4 == 0 && year % 100 != 0)
            System.out.println("There are 29 days in this month");
            else
            System.out.println("There are 28 days in this month");
            break;
       default:System.out.println("Invalid Input");
    }
}
```

}

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
month	int	Stores the month number input by the user (1–12).
year	int	Stores the year input by the user to check for leap year conditions.

Output:



Program-28

Program Name: Series1

Problem Statement: Create a menu-driven Java program to display or compute values for various mathematical series based on user selection.

Java Code:

```
import java.util.Scanner;
/**
* This program displays a series or the sum of a series depending on the user's choice,using for loops.
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
public class Series1
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter 1 to display series 1");
      System.out.println("Enter 2 to print the sum of series 2");
      System.out.println("Enter 3 to print the sum of series 3");
      System.out.println("Enter 4 to print the sum of series 4");
      System.out.println("Enter 5 to display series 5");
      System.out.println("Enter 6 to display series 6");
      int choice = ob.nextInt();
      switch(choice)
      {
```

```
case 1: System.out.println("Enter a limit");
        int limit = ob.nextInt(); int s = 0;
        System.out.println("Output:");
        System.out.println("The series is : ");
        for(int i = 0;i < limit;i++)
        {
           s += (int)Math.pow(10,i);
           System.out.print(s+" ");
        }
        break;

case 2: System.out.println("Enter a value for variable 'a' ");
        int a = ob.nextInt();int sum = 0;
        for(int j = 1;j <= a;j++)
        {
           sum += (int)Math.pow(a,j);
        }
        System.out.println("Output:");
        System.out.println("The sum of the series is : "+sum);
        break;
case 3: System.out.println("Enter a value for variable 'a' ");
        int c = ob.nextInt();double total=0.0d;
        for(int l = 1;l <= 20;l++)
        {
           total += (c * l);
        }
        System.out.println("Output:");
```

```
        System.out.println("The sum of the series is : "+total);
        break;

case 4: int tally = 0;
        for(int m = 1;m <= 19;m++)
        {
           tally += (m * (m + 1) );
        }
        System.out.println("Output:");
        System.out.println("The sum of the series is : "+tally);
        break;

case 5: System.out.println("Enter a limit");
        int e = ob.nextInt();
        System.out.println("Output:");
        System.out.println("The series is : ");
        for(int o = 1;o <= e;o++)
        {
           System.out.print((int)Math.pow(o,3) - 1+",");
        }
        break;

case 6: System.out.println("Enter a limit");
        double f = ob.nextDouble();
        System.out.println("Output:");
        System.out.println("The series is : ");
        for(double p = 1.50;p <= f;p += 1.50)
```

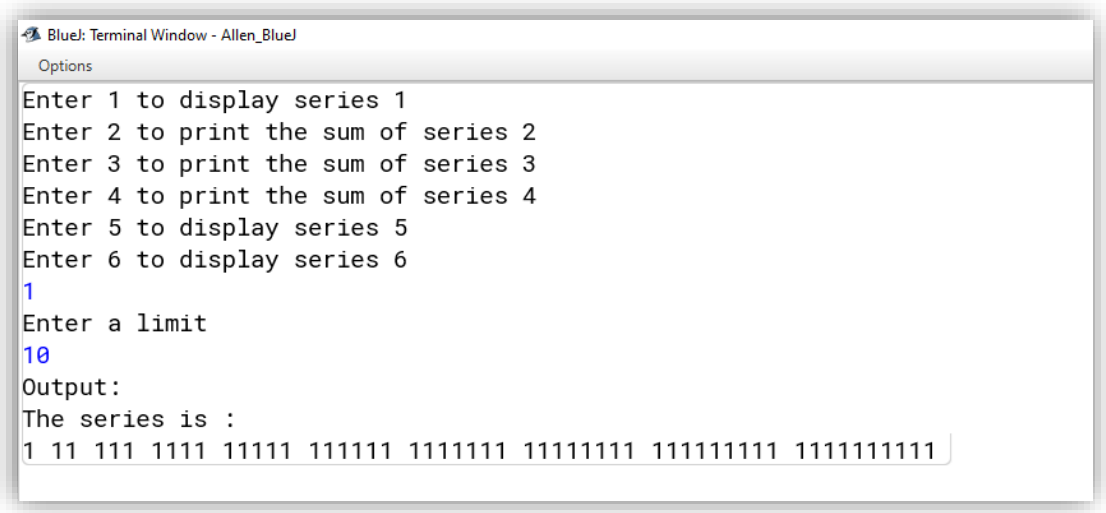
```
            {
               System.out.print(p+",");
            }
            break;
        default:System.out.println("Invalid Input");
      }
   }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
choice	int	Stores the user's choice for one of six series-related tasks.
limit	int	Stores the upper limit for generating series 1.
s	int	Accumulates the sum of powers of 10 for series 1.
i	int	Loop counter for iterating through powers in series 1.
a	int	Stores the input value for variable a in series 2.
sum	int	Stores the sum of powers of a for series 2.
j	int	Loop counter for calculating the sum in series 2.
c	int	Stores the input value for variable a in series 3.
total	double	Stores the calculated sum of the series in series 3.

Variable Name	Variable Datatype	Variable Description
l	int	Loop counter for calculating the sum in series 3.
tally	int	Stores the calculated sum of products in series 4.
m	int	Loop counter for calculating products in series 4.
e	int	Stores the upper limit for generating series 5.
o	int	Loop counter for generating series 5.
f	double	Stores the upper limit for generating series 6.
p	double	Loop counter for generating values in steps of 1.50 for series 6.

Output:



Program-29

Program Name: Magic_Number

Problem Statement: Develop a Java program to determine whether a given number is a "Magic Number." A number is considered a Magic Number if the repeated sum of its digits reduces to a single digit, and that single digit is 1.

Java Code:

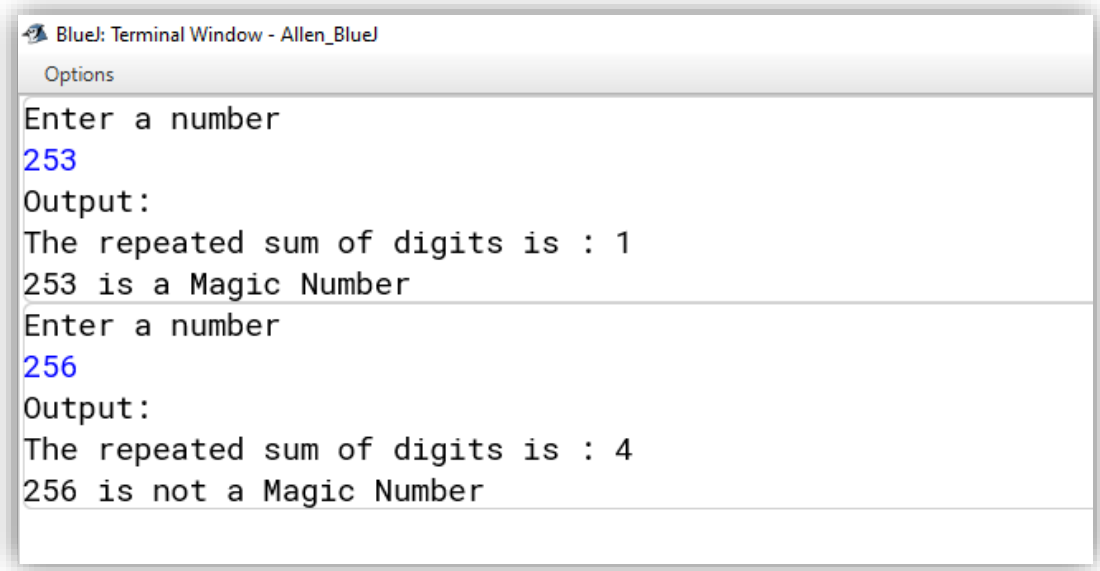
```
import java.util.Scanner;
/**
 * The program calls an entered number as a magic number if the repeated sum of its digits equals to 1
 * Example: 253 -> 2 + 5 + 3 = 10 -> 1 + 0 = 1 (Hence 253 is a Magic Number)
 * Example: 254 -> 2 + 5 + 4 = 11 -> 1 + 1 = 2 (254 is not a Magic Number since repeated sum of its digits not 1)
 *
 * @author (Allen Thomas.M)
 * @author email (allenthomasmuttikal@gmail.com)
 * @author git(https://github.com/allenthomasmuttikal/Java_Project)
 * @version (v1.0)
 */
public class Magic_Number
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter a number");
      int num = ob.nextInt();
      int n = num; int a = 0;
      while(num > 9)
      {
         int sum = 0;
         while(num != 0)
```

```
        {
            a = num % 10;
            sum += a;
            num /= 10;
        }
        num = sum;
    }
    System.out.println("Output:");
    System.out.println("The repeated sum of digits is : "+num);
    if(num == 1)
    System.out.println(n+" is a Magic Number");
    else
    System.out.println(n+" is not a Magic Number");
  }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
num	int	Stores the number entered by the user for magic number evaluation.
n	int	Stores the original value of the input number num for output purposes.
a	int	Stores the remainder during digit extraction from num.
sum	int	Stores the intermediate sum of the digits of num during calculations.

Output:


BlueJ: Terminal Window - Allen_BlueJ
Options
Enter a number
253
Output:
The repeated sum of digits is : 1
253 is a Magic Number
Enter a number
256
Output:
The repeated sum of digits is : 4
256 is not a Magic Number

Program-30

Program Name: Fibonacci

Problem Statement: Develop a Java program to generate and display the Fibonacci sequence up to a specified limit.

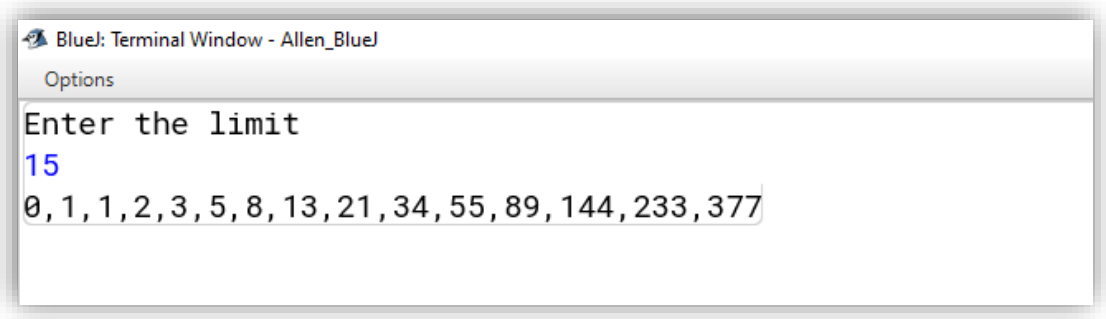
Java Code:

```
import java.util.Scanner;
public class Fibonacci
{
   public static void main(String args[])
   {
     Scanner ob=new Scanner(System.in);
     System.out.println("Enter the limit");
     int lim=ob.nextInt();
     int a=0,b=1;
     System.out.print(a+","+b);
          for(int c=3;c<=lim;c++)
     {
        int d=a+b;
        System.out.print(","+d);
        a=b;
        b=d;
     }
   }
   }
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
lim	int	Stores the upper limit for generating the Fibonacci series.
a	int	Stores the first number in the Fibonacci sequence (initially set to 0).
b	int	Stores the second number in the Fibonacci sequence (initially set to 1).
c	int	Loop counter for generating subsequent numbers in the Fibonacci sequence.
d	int	Temporarily stores the sum of the previous two numbers in the Fibonacci sequence.

Output:



Program-31

Program Name: Tribonacci

Problem Statement: Create a Java program that generates and displays the Tribonacci sequence up to a specified limit.

Java Code:

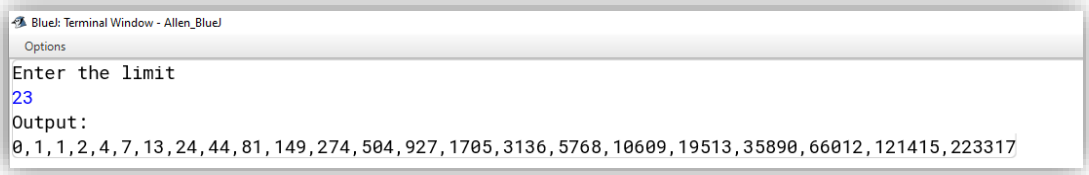
```
import java.util.Scanner;
/**
* This program displays the tribonacci series till a given limit.
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
public class Tribonacci
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter the limit");
      int lim = ob.nextInt();
      int a = 0,b = 1; int sum = 1;
      System.out.println("Output:");
      System.out.print(a+","+b+","+sum);
            for(int c = 4;c <= lim;c++)
      {
         int d = a + b + sum;
         System.out.print(","+d);
```

```
        a = b;
        b = sum;
        sum = d;
    }
  }
  }
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Object used to read user input from the console.
lim	int	Stores the upper limit for generating the Tribonacci series.
a	int	Stores the first number in the Tribonacci sequence (initially 0).
b	int	Stores the second number in the Tribonacci sequence (initially 1).
sum	int	Stores the third number in the Tribonacci sequence (initially 1).
c	int	Loop counter for generating subsequent numbers in the Tribonacci series.
d	int	Temporarily stores the sum of the previous three numbers in the Tribonacci sequence.

Output:



Program-32

Program Name: Sunny_Number

Problem Statement: Develop a Java program to determine whether a given number is a "Sunny Number." A number is considered a Sunny Number if the square root of the number that follows it (n + 1) is a perfect square.

Java Code:

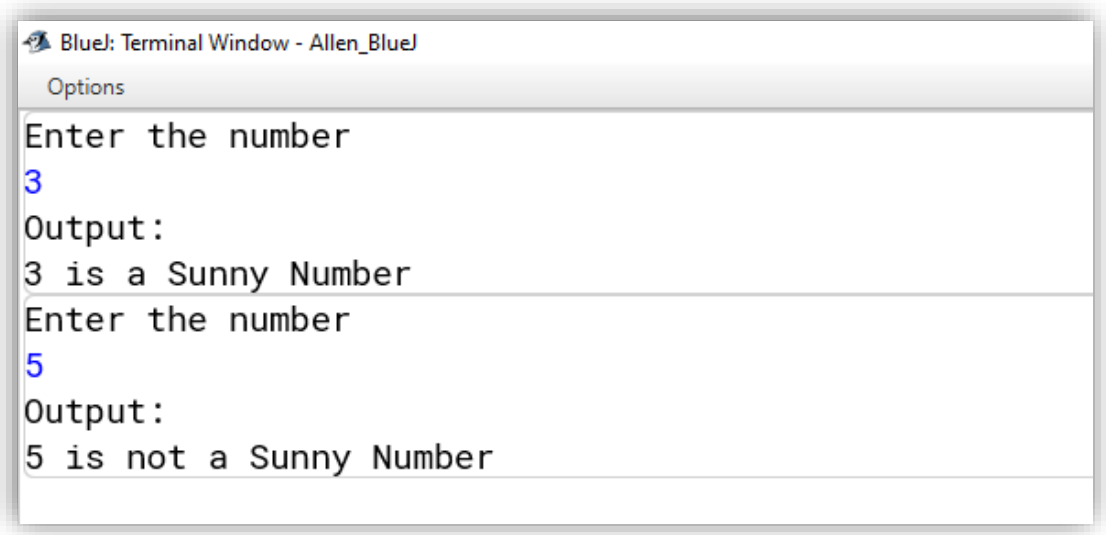
```
import java.util.Scanner;
/**
* This program checks and displays if the entered number is a Sunny Number.
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
public class Sunny_Number
{
   public static void main(String args[])
   {
      Scanner ob = new Scanner(System.in);
      System.out.println("Enter the number");
      int n = ob.nextInt();
      int next_N = n + 1;
      System.out.println("Output:");
      if(Math.sqrt(n + 1) % 1 == 0)
      System.out.println(n+" is a Sunny Number");
      else
      System.out.println(n+" is not a Sunny Number");
```

```
    }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Represents the Scanner object for input.
n	int	Holds the integer input from the user.
next_N	int	Stores the next number after n.

Output:



Program-33

Program Name: series

Problem Statement: Develop a menu-driven Java program that generates and displays various patterns based on user selection.

Java Code:

```
import java.util.Scanner;
/**
* This program displays certain patterns based on the user's choice.
*
* @author (Allen Thomas.M)
* @author email (allenthomasmuttikal@gmail.com)
* @author git(https://github.com/allenthomasmuttikal/Java_Project)
* @version (v1.0)
*/
public class series
{
   public static void main(String args[])
   {
     Scanner ob = new Scanner(System.in);
     System.out.println("Enter numbers from 1-10 to display respective patterns");
     int choice = ob.nextInt();
      switch(choice)
     {
        case 1:System.out.println("Output:");
              for(int n = 1;n <= 5;n++)
              {
               for(int j = 1;j <= n;j++)
               System.out.print(n);
```

```
        System.out.println("");
      }
      break;

case 2:System.out.println("Output:");
      for(int a = 6;a >= 1;a--)
      {
       for(int b = 1;b <= a;b++)
       System.out.print(a);
       System.out.println("");
      }
      break;

case 3: System.out.println("Output:");
      for(int c = 9;c >= 1;c -= 2 )
      {
       for(int d = 5;d >= 1;d--)
       System.out.print(c);
       System.out.println("");
      }
      break;

case 4: System.out.println("Output:");
      for(int e = 9;e >= 1;e -= 2)
      {
         for(int f = e;f <= 9;f += 2)
         System.out.print(f);
```

```
            System.out.println("");
        }
        break;

case 5: System.out.println("Output:");
        for(int g = 9;g >= 1;g -= 2)
       {
        for(int h = 9;h >= g;h -= 2)
        System.out.print(h);
        System.out.println("");

        }
        break;

case 6: System.out.println("Output:");
        for(int i =9;i >= 1;i -= 2)
        {
          for(int k = i;k >= 1;k -= 2)
          System.out.print(k);
          System.out.println("");
        }
       break;

case 7:System.out.println("Output:");
        for(int o = 5;o >= 1;o--)
       {
           for(int p = o;p >= 1;p--)
```

```
            System.out.print(p);
            System.out.println("");
        }
        break;

case 8: System.out.println("Output:");
        for(int q = 1;q <= 9;q += 2)

        {
            for(int r = 9;r >= q;r -= 2)
            {
                System.out.print(r);
            }
            System.out.println("");
            }
        break;

case 9:int count = 1;
        System.out.println("Output:");
            for(int t = 1;t <= 10;t++)
        {
            for(int s = 1;s <= t;s++)
            {
              System.out.print(count+" ");
              count++;
            }
              System.out.println("");
```

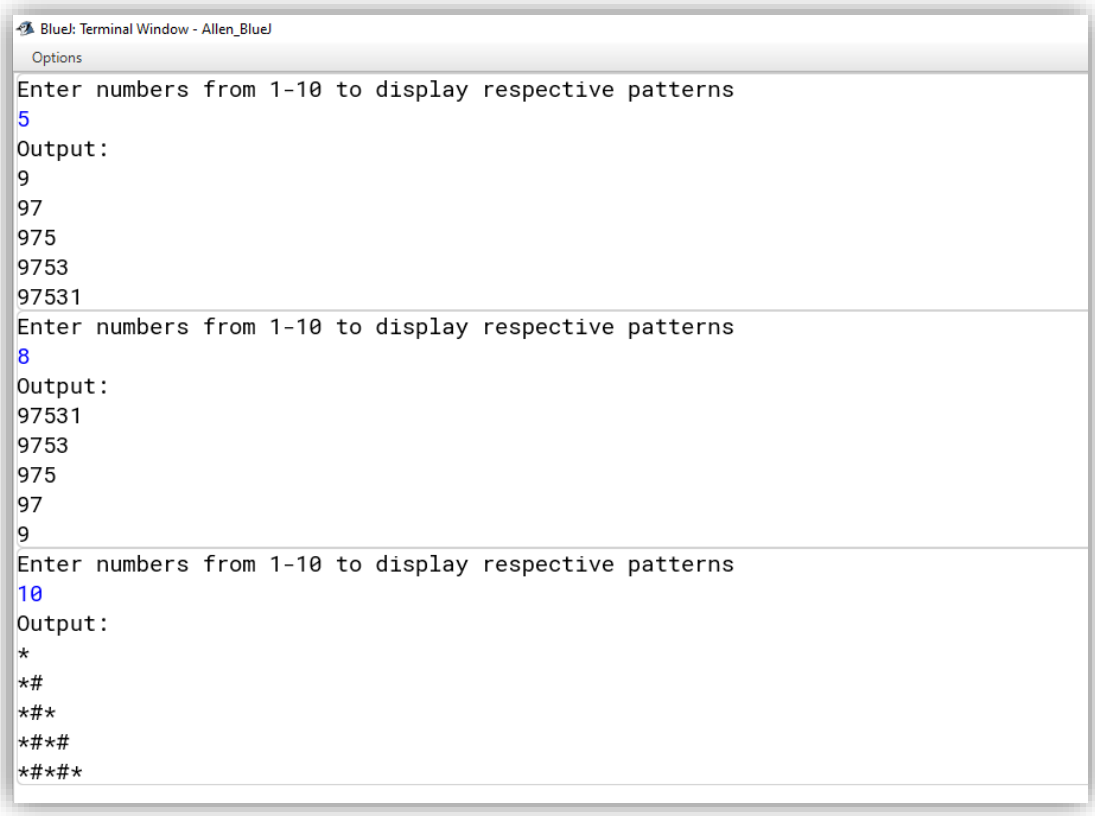
```
                if(count > 10)
                break;
            }
             break;

        case 10:System.out.println("Output:");
             for(int l = 1;l <= 5;l++)
            {
               for(int m = 1;m <= l;m++)
               {
                  if(m % 2 == 0)
                  System.out.print("#");
                  else
                  System.out.print("*");
                                  }
               System.out.println("");
            }
            break;

        default:System.out.println("Invalid Input");
      }
   }
}
```

Variables Used:

Variable Name	Variable Datatype	Variable Description
ob	Scanner	Represents the Scanner object used for taking input from the user.
choice	int	Stores the user's choice (1-10) to display respective patterns.
n	int	Loop variable used for iterating and generating patterns.
j	int	Inner loop variable used for generating repeated values in patterns (Case 1).
a	int	Loop variable for iterating patterns in reverse order (Case 2).
b	int	Inner loop variable for pattern generation in reverse order (Case 2).
c	int	Loop variable for decrementing pattern values (Case 3).
D	int	Inner loop variable used for repetitive pattern generation (Case 3).
e	int	Loop variable used for incrementing pattern values (Case 4).
f	int	Inner loop variable used for generating ascending values (Case 4).
g	int	Loop variable for generating descending values in patterns (Case 5).
h	int	Inner loop variable used for generating values less than the loop variable (Case 5).
i	int	Loop variable used for decrementing odd numbers in patterns (Case 6).
k	int	Inner loop variable for decrementing values in patterns (Case 6).
o	int	Loop variable used for generating reverse number sequences (Case 7).

Variable Name	Variable Datatype	Variable Description
p	int	Inner loop variable used for printing reverse sequences (Case 7).
q	int	Loop variable for incrementing odd numbers (Case 8).
r	int	Inner loop variable for decrementing values in patterns (Case 8).
count	int	Counter used for printing sequential numbers (Case 9).
t	int	Loop variable used for iterating rows in Case 9.
s	int	Inner loop variable for generating sequential numbers (Case 9).
l	int	Loop variable used for iterating rows with symbol patterns (Case 10).
m	int	Inner loop variable for alternating between symbols (Case 10).

Output:


BlueJ: Terminal Window - Allen_BlueJ
Options
Enter numbers from 1-10 to display respective patterns
5
Output:
9
97
975
9753
97531
Enter numbers from 1-10 to display respective patterns
8
Output:
97531
9753
975
97
9
Enter numbers from 1-10 to display respective patterns
10
Output:
*
*#
#
##
##*

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This project has been a wonderful opportunity to strengthen my problem-solving skills and deepen my understanding of Java programming concepts like conditional statements, loops, and the Scanner class.

Thank you all for being a part of this journey!

Sincerely,

Allen Thomas M

Grade 10 'C'