**Number Patterns**

**Day-01**

**04-03-2025**

**=================**

**// Analyze the output of the below program**

import java.util.Scanner;

class PatternPractice{

 public static void main(String[] args)

 {

 Scanner scan = new Scanner(System.in);

 System.out.println("Enter total row:");

 int n = scan.nextInt();

 for(int i = 1;i <= n; i++)

 {

 for(int j = 1; j <= 2\*(n-i); j++)

 {

 System.out.print(" ");

 }

 for(int k = 1; k <= 2\*i-1; k++)

 {

 System.out.print("\* ");

 }

 System.out.println();

 }

 for(int i = 1; i <= n-1; i++)

 {

 for(int j = 1; j <= 2 \* i; j++){

 System.out.print(" ");

 }

 for(int k = 1; k < 2\*(n-i); k++)

 {

 System.out.print("\* ");

 }

 System.out.println();

 }

 }

}

**// Right angled triangle with row number**

class RightAngledTriangleWithRow{

 public static void main(String[] args){

 int rows = 8;

 for(int i = 1; i <= rows; i++)

 {

 for(int j = 1; j <= i; j++){

 System.out.print(i + " ");

 }

 System.out.println();

 }

 }

}

**// Square Pattern With Numbers**

class SquarePatternWithNumber{

 public static void main(String[] args)

 {

 int n = 5;

 for(int i = 1; i <= n; i++)

 {

 for(int j = 1; j <= n; j++)

 {

 System.out.print(j-i+" ");

 }

 System.out.println();

 }

 }

}

**// Pyramid Pattern With Column Number**

class PyramidPatternWithColumnNumber{

 public static void main(String args[])

 {

 int n = 6;

 for(int i = 1; i <= n; i++)

 {

 for(int j = 1; j <= 2 \*(n-i); j++)

 {

 System.out.print(" ");

 }

 for(int k = 1; k <= i; k++)

 {

 System.out.print(k +" ");

 }

 System.out.println();

 }

 }

}

**// Pyramid Pattern with Row Number**

class PyramidPatternWithRowNumber{

 public static void main(String args[])

 {

 int n = 6;

 for(int i = 1; i <= n; i++)

 {

 for(int j = 1; j <= 2 \*(n-i); j++)

 {

 System.out.print(" ");

 }

 for(int k = 1; k <= i; k++)

 {

 System.out.print(i +" ");

 }

 System.out.println();

 }

 }

}

**// Triangle Pattern With One And Zero**

import java.util.Scanner;

class TrianglePatternWithOneAndZero{

 public static void main(String[] args){

 Scanner scan = new Scanner(System.in);

 System.out.println("Enter number of rows:");

 int n = scan.nextInt();

 for(int i = 1; i <= n; i++)

 {

 for(int j = 1; j <= (n - i); j++)

 {

 System.out.print(" ");

 }

 for(int k = 1; k <= i; k++){

 if(k % 2 == 0)

 {

 System.out.print(0 + " ");

 }

 else{

 System.out.print(1 + " ");

 }

 }

 System.out.println();

 }

 }

}

Assignment:

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1) WAP TO PRINT THE HALLOW RHOMBUS PATTERN

2) WAP TO PRINT THE RIGHT ANGLED TRIANGLE WITH COLUMN NUMBER.

**Day-02**

**05-05-2025**

**=================**

**/\* WRITE A PROGRAM TO PRINT THE BELOW PATTERN**

**1**

**0 1**

**1 0 1**

**0 1 0 1**

**1 0 1 0 1**

**\*/**

import java.util.Scanner;

class PatternPractice{

 public static void main(String[] args)

 {

 Scanner scan = new Scanner(System.in);

 System.out.println("Enter number of rows:");

 int n = scan.nextInt();

 int start;

 for(int i = 1; i <= n; i++)

 {

 if(i % 2 == 0)

 start = 0;

 else

 start = 1;

 for(int j = 1; j <= i; j++)

 {

 System.out.print(start+" ");

 start = 1 - start;

 }

 System.out.println();

 }

 }

}

**/\* WAP TO FIND THE COMBINATIONS**

**ncr = n! / (n-r)! \* r!**

**\*/**

import java.util.Scanner;

class Combinations{

 public static int ncr(int n, int r)

 {

 int result = factorial(n) / (factorial(n-r) \* factorial (r));

 return result;

 }

 public static int factorial(int n){

 if(n <= 1)

 return 1;

 int fact = 1;

 for(int i = n; i >= 1; i--)

 {

 fact = fact \* i; // 5 20 60 120 120

 }

 return fact;

 }

 public static void main(String[] args)

 {

 Scanner scan = new Scanner(System.in);

 System.out.println("Enter a value:");

 int number = scan.nextInt();

 System.out.println("Enter a value:");

 int value = scan.nextInt();

 int r = ncr(number, value);

 System.out.println("The Total combinations are = "+r);

 }

}

**/\* WRITE A JAVA PROGRAM FOR PRINTING THE BELOW PATTERN (Pascal's Triangle).**

 **1**

 **1 1**

 **1 2 1**

 **1 3 3 1**

 **1 4 6 4 1**

**1 5 10 10 5 1**

**\*/**

import java.util.Scanner;

class PascalTriangle{

 public static int ncr(int n, int r)

 {

 int result = factorial(n) / (factorial(n-r) \* factorial (r));

 return result;

 }

 public static int factorial(int n){

 if(n <= 1)

 return 1;

 int fact = 1;

 for(int i = n; i >= 1; i--)

 {

 fact = fact \* i; // 5 20 60 120 120

 }

 return fact;

 }

 public static void printPattern(int n)

 {

 for(int i = 0; i < n; i++)

 {

 for(int s = 1; s <= (n-i); s++)

 {

 System.out.print(" ");

 }

 for(int j = 0; j <= i; j++){

 System.out.print(ncr(i, j) + " ");

 }

 System.out.println();

 }

 }

 public static void main(String[] args)

 {

 Scanner scan = new Scanner(System.in);

 System.out.println("Enter a value:");

 int n = scan.nextInt();

 printPattern(n);

 }

}