**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);

}

}