1. Write a Program to Print ArmStrong Numbers in a range of Values

# An **Armstrong number** of three digits is an integer such that the sum of the cubes of its digits is equal to the number itself.

# For example, 371 is an Armstrong number since 3\*\*3 + 7\*\*3 + 1\*\*3 = 371.

for i in range(1001):

num = i # To compare number with actual result

n = len(str(i))

result = 0

while i!= 0:

digit = i % 10

result = result+digit\*\*n

i = i//10 # **//** is Truncating Division Operator

if num == result:

print(num)

2(A). Write a Program to print following Pattern

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

n = int(input("Enter number of Rows: "))

for i in range(1, n+1):

for j in range(1, i+1):

print(j, end=" ")

print()

2(B). Write a Program to print following Pattern

1

2 2

3 3 3

4 4 4 4

5 5 5 5 5

n = int(input("Enter number of Rows: "))

for i in range(1, n+1):

for j in range(1, i+1):

print(i, end=" ")

print()

2(C). Write a Program to print following Pattern

1 2 3 4 5

1 2 3 4

1 2 3

1 2

1

n = int(input("Enter number of Rows: "))

for row in range(n,0,-1):

for col in range(1, row+1):

print(col, end=" ")

print()

2(D). Write a Program to print following Pattern

5 5 5 5 5

4 4 4 4

3 3 3

2 2

1

n = int(input("Enter number of Rows: "))

for row in range(n,0,-1):

      for col in range(1, row+1):

             print(row, end=" ")

      print()

3(A). Write a program to print Hollow Right Angle Triangle with stars as below

\*

\* \*

\* \*

\* \*

\* \* \* \*

n = int(input("Enter number of Rows: "))

for row in range(n):

for col in range(n):

if col==0 or row==(n-1) or row==col:

print("\*",end="")

else:

print(end=" ")

print()

3(B).Write a program to print Hollow Right Angle Triangle with stars as below

\* \* \* \* \*

   \*       \*

      \*    \*

        \*  \*

           \*

# **range(5,0,-1) will take values from 5 to 1 in decreasing order with difference of 1**

n = int(input("Enter number of Rows: "))

for row in range(n,0,-1):

      for col in range(n,0,-1):

             if col == 1 or row == n or row == col:

                  print("\*", end="")

            else:

                  print(end=" ")

      print()

4(A). Write a Program to find Factorial of a number using in-built function

import math

n = int(input("Enter a Number: "))

result = math.factorial(n)

print("Factorial of ",n,"is ",result)

Output:

Enter a Number: 7

Factorial of 7 is 5040

4(B). Write a Program to find Factorial of a number using Recursion

n = int(input("Enter a Number: "))

def fact(n):

if n==0:

return 1

else:

return n \* fact(n-1)

result = fact(n)

print("Factorial of ",n,"is ",result)

Output:

Enter a Number: 9

Factorial of 9 is 362880

4(C). Write a Program to find Factorial of a number using for loop

n = int(input("Enter a Number: "))

result = 1

for i in range(n,0,-1):

       result = result \* i

print("Factorial of ",n,"is ",result)

Output:

Enter a Number: 9

Factorial of 9 is 362880

5. Write a program to print Flyod's Triangle as below

1

2 3

4 5 6

7 8 9 10

n = int(input("Enter a Number: "))

num = 1

for row in range(1, n+1):

for col in range(1, row+1):

print(num, end=" ")

num = num + 1

print()

6. Write a Program to print a String in Triangle format as below

P

P Y

P Y T

P Y T H

P Y T H O

P Y T H O N

string = input("Enter a string: ")

length = len(string)

for row in range(length):

for col in range(row+1):

print(string[col],end=" ")

print()

7. Write a Program to print fibonacci series of numbers

n = int(input("Enter how many numbers you want in the series: "))

first = 0

second = 1

for i in range(n):

print(first,end=" ")

temp = first

first = second

second = temp + second

Output:

Enter how many numbers you want in the series: 7

0 1 1 2 3 5 8

8(A). Write a Program to print Prime Numbers in the given Interval

lower = int(input("Enter lower interval: "))

upper = int(input("Enter upper interval: "))

for num in range(lower,upper+1):

        if num>1:

             for i in range(2,num):

                  if(num%i)==0:

                       break

             else:

                 print( num, end=" ")

Output:

Enter lower interval: 3

Enter upper interval: 15

3 5 7 11 13

8(B). Write Program to check Entered Number is Prime or Not

num = int(input("Enter a Number: "))

if num > 1:

for i in range(2,num):

if(num % i)==0:

print(num, "is not a Prime Number")

break

else:

print(num, "is a Prime Number")

else:

print(num, "is not a Prime Number")

Output:

Enter a Number: 29

29 is a Prime Number

9(A). Write a Program to print Hollow Equilateral Triangle

for row in range(1,5):

for col in range(1,8):

if row==4 or row+col==5 or col-row==3:

print("\*",end="")

else:

print(end=" ")

print()

9(B). Write a Program to print Hollow Equilateral Triangle for user specified Range

n = int(input("Enter number of rows: "))

for row in range(1,n+1):

for col in range(1,2\*n):

if row==n or row+col==n+1 or col-row==n-1:

print("\*",end="")

  else:

  print(end=" ")

  print()

10(A). Write a Program to check entered number is Perfect Number or not

Perfect Number: A Perfect Number is a number which is equal to the sum of its Positive Divisors

  excluding the number itself

n = int(input("Enter a number to check : "))

sum=0

for i in range(1,n):

if n%i==0:

sum=sum+i

if sum==n:

print(n, " is a Perfect Number")

else:

print(n, " is not a Perfect Number")

Output:

Enter a number to check : 6

6 is a Perfect Number

10(B). Write a Program to print Perfect Numbers in given interval

n1 = int(input("Enter lower limit: "))

n2 = int(input("Enter upper limit: "))

for num in range(n1,n2+1):

sum = 0

for j in range(1,num):

if num%j==0:

sum=sum+j

if sum==num:

print(num,end=" ")

Output:

Enter lower limit: 1

Enter upper limit: 500

6 28 496

11(A). Write a Program to swap two numbers using third variable

a = int(input("Enter value of a: "))

b = int(input("Enter value of b: "))

temp = a

a = b

b = temp

print("After Swapping:")

print("Value of a: ", a)

print("Value of b: ", b)

Output:

Enter value of a: 13

Enter value of b: 17

After Swapping:

Value of a: 17

Value of b: 13

11(B). Write a Program to swap two numbers without using third variable

a = int(input("Enter value of a: "))

b = int(input("Enter value of b: "))

a = a^b # a = a + b # a = a \* b

b = a^b # b = a - b # b = a / b

a = a^b # a = a - b # a = a / b

print("After Swapping:")

print("Value of a: ", a)

print("Value of b: ", b)

Output:  
Enter value of a: 45  
Enter value of b: 77  
After Swapping:  
Value of a: 77  
Value of b: 45

12(A). Write a Program to reverse a String using for loop

def reverse(string):

reversed\_string = ""

for i in string:

reversed\_string = i + reversed\_string

print("Reversed String : ", reversed\_string)

string = input("Enter String: ")

print("Entered String: ", string)

reverse(string)

Output:

Enter String: PYTHON

Entered String: PYTHON

Reversed String: NOHTYP

12(B). Write a Program to reverse a Number using while loop

def reverse(number):

reversed\_number = 0

while number>0:

rem = number % 10

reversed\_number = (reversed\_number \* 10) + rem

number = number//10

print("Reversed Number is ", reversed\_number)

number = int(input("Enter a Number: "))

print("Entered Number is ",number)

reverse(number)

Output:

Enter a Number: 789

Entered Number is 789

Reversed Number is 987

13(A). **Write a Program to print '\*' in Right angle triangle shape**

num = int(input("Enter number of rows: "))

for i in range(1,num+1):

      for j in range(1,i+1):

            print("\*", end="")

      print()

Output:

Enter number of rows: 5

\*  
\*\*  
\*\*\*  
\*\*\*\*  
\*\*\*\*\*

13(B). **Write a Program to print '\*' in Right angle triangle shape in below pattern**

**\*  
\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*\*\***

num = int(input("Enter number of rows: "))

k=1

for i in range(1,num+1):

      for j in range(1,k+1):

            print("\*", end="")

      k=k+2

      print()

Output:

Enter number of rows: 3

**\*  
\*\*\*  
\*\*\*\*\***

14(A). **Write a Program to print "\*" in Pyramid shape as below**

   \*   
  \* \*   
 \* \* \*   
\* \* \* \*

**code 1:**

num = int(input("Enter number of rows: "))

for i in range(0,num+1):

      for j in range(0,num-i-1):     # To print spaces

            print(end=" ")

      for j in range(0,i+1):     # To print \*

            print("\*",end=" ")

      print()

Output:

Enter number of rows: 4

   \*   
  \* \*   
 \* \* \*   
\* \* \* \*

**Code 2:**

def pyramid(rows):

     for i in range(rows):

           print(' '\*(rows-i-1) + "\* "\*(i+1))

Output:

pyramid(4)

   \*   
  \* \*   
 \* \* \*   
\* \* \* \*

14(B). **Write a Program to print odd number of "\*" in rows in Pyramid shape as below**

**\*  
   \*\*\*  
  \*\*\*\*\*  
 \*\*\*\*\*\*\*  
\*\*\*\*\*\*\*\*\***

**Code 1:**

num = int(input("Enter number of rows: "))

for i in range(0,num+1):

      for j in range(0,num-i-1):     # To print spaces

            print(end=" ")

      for j in range(0,**2\*i+1**):     # To print odd number of \* in each row

            print("\*",end="")

      print()

Output:

Enter number of rows: 5

**\*  
   \*\*\*  
  \*\*\*\*\*  
 \*\*\*\*\*\*\*  
\*\*\*\*\*\*\*\*\***

**Code 2:**

def pyramid(rows):

     for i in range(rows):

           print(' '\*(rows-i-1) + "\* "\*(**2\*i**+1))

Output:

pyramid(5)

**\*  
   \*\*\*  
  \*\*\*\*\*  
 \*\*\*\*\*\*\*  
\*\*\*\*\*\*\*\*\***

14(C). **Write a Program to print "\*" in Reverse Pyramid shape as below**

\* \* \* \* \*   
 \* \* \* \*   
  \* \* \*   
   \* \*   
    \*

num = int(input("Enter number of rows: "))

for i in range(num,0,-1):

      for j in range(0,num-i):

            print(end=" ")

      for j in range(0,**i**):

            print("\*",end="")

      print()

Output:

Enter number of rows: 5

\* \* \* \* \*   
 \* \* \* \*   
  \* \* \*   
   \* \*   
    \*

15. **Write a Program to print "\*" in Diamond shape as below**

**\*   
   \* \*   
  \* \* \*   
 \* \* \* \*   
\* \* \* \* \*   
 \* \* \* \*   
  \* \* \*   
   \* \*   
    \***

**Code 1:**

num = int(input("Enter number of rows: "))

# To Print Upper Part of Diamond shape

for i in range(0,num):

      for j in range(0,num-i):

            print(end=" ")

      for j in range(0,i):

            print("\*",end=" ")

      print()

# To Print Lower Part of Diamond shape

for i in range(num,0,-1):

      for j in range(0,num-i):

            print(end=" ")

      for j in range(0,**i**):

            print("\*",end="")

      print()

Output:

**\*   
   \* \*   
  \* \* \*   
 \* \* \* \*   
\* \* \* \* \*   
 \* \* \* \*   
  \* \* \*   
   \* \*   
    \***

**Code 2:**

def pyramid(rows):

     for i in range(rows):

           print(' '\*(rows-i-1) + "\* "\*(**i**+1))

     for j in range(rows-1,0,-1):

           print(' '\*(rows-j) + "\* "\*(**j**))

Output:

pyramid(5)

**\*   
   \* \*   
  \* \* \*   
 \* \* \* \*   
\* \* \* \* \*   
 \* \* \* \*   
  \* \* \*   
   \* \*   
    \***

16. **Write a Program to print "\*" in Right Triangle shape as below**

**\*\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*  
\*\*\*  
\*\*  
\***

num = int(input("Enter number of rows: "))

for i in range(num,0,-1):

      for j in range(1,i+1):

            print("\*", end="")

      print()

Output:

Enter number of rows: 6

\*\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*  
\*\*\*  
\*\*  
\*

17.