**Uses of Control Statements in Python Programming**

1. **FACTORIAL**

num = int(input("enter a number: "))

fac = 1

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

fac = fac \* i

print("factorial of ", num, " is ", fac)

LEAP YEAR

year = int(input("Enter a year: "))

if (year % 400 == 0) and (year % 100 == 0):

print("{0} is a leap year".format(year))

elif (year % 4 ==0) and (year % 100 != 0):

print("{0} is a leap year".format(year))

else:

print("{0} is not a leap year".format(year))

ODD EVEN

# Python program to check if the input number is odd or even.

# A number is even if division by 2 gives a remainder of 0.

# If the remainder is 1, it is an odd number.

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

if (num % 2) == 0:

print("{0} is Even".format(num))

else:

print("{0} is Odd".format(num))

**Output 1**

Enter a number: 43

43 is Odd

# Program to check if a number is prime or not

num = 29

# To take input from the user

#num = int(input("Enter a number: "))

# define a flag variable

flag = False

# prime numbers are greater than 1

if num > 1:

# check for factors

for i in range(2, num):

if (num % i) == 0:

# if factor is found, set flag to True

flag = True

# break out of loop

break

# check if flag is True

if flag:

print(num, "is not a prime number")

else:

print(num, "is a prime number")

PALINDROME NUMBER

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

temp=n

rev=0

**while**(n>0):

dig=n%10

rev=rev\*10+dig

n=n//10

**if**(temp==rev):

**print**("The number is a palindrome!")

**else**:

**print**("The number isn't a palindrome!")

REVERSE OF A NUMBER

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

rev=0

**while**(n>0):

dig=n%10

rev=rev\*10+dig

n=n//10

**print**("Reverse of the number:",rev)

SUM OF CUBES OF N NATURAL NUMBERS

def sumOfSeries(n):

   sum = 0

   for i in range(1, n+1):

      sum +=i\*i\*i

   return sum

# Driver Function

n = 3

print(sumOfSeries(n))

PERFECT NUMBER

n = int(input("Enter any number: "))

sum1 = 0

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

**if**(n % i == 0):

sum1 = sum1 + i

**if** (sum1 == n):

**print**("The number is a Perfect number!")

**else**:

**print**("The number is not a Perfect number!")

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

sum1 = 0

**while**(n > 0):

sum1=sum1+n

n=n-1

**print**("The sum of first n natural numbers is",sum1)

PRIME NUMBER IN GIVEN RANGE

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

**for** a **in** range(2,r+1):

k=0

**for** i **in** range(2,a//2+1):

**if**(a%i==0):

k=k+1

**if**(k<=0):

**print**(a)

SUM OF SQUARES OF N NATURAL NUMBERS

n = int(input("Enter nth number : "))

sum = 0

**for** s **in** range(1, n+1):

sum = sum + (s\*s)

print("Sum of squares is : ", sum)

## Reverse a Number using while Loop

print("Enter a Number: ")

num = int(input())

rev = 0

while num!=0:

rem = num%10

rev = rem + (rev\*10)

num = int(num/10)

print("\nReverse =", rev)

## Find Square Root of a Number using \*\*

print("Enter a Number: ")

num = int(input())

squareroot = num \*\* 0.5

print("\nSquare Root =", squareroot)

Second method

import math

print("Enter a Number: ", end="")

try:

num = int(input())

res = math.sqrt(num)

print("\nSquare Root of " +str(num)+ " = " +str(res))

except ValueError:

print("\nInvalid Input!")

## Python Swap Two Variables using Third Variable

print("Enter any Value for First Variable: ", end="")

variableOne = input()

print("Enter any Value for Second Variable: ", end="")

variableTwo = input()

print("\nBefore Swap:")

print("Value of \"variableOne\" =", variableOne)

print("Value of \"variableTwo\" =", variableTwo)

x = variableOne

variableOne = variableTwo

variableTwo = x

print("\nAfter Swap:")

print("Value of \"variableOne\" =", variableOne)

print("Value of \"variableTwo\" =", variableTwo)

## Find Average of n Numbers using for Loop

print("Enter the Value of n: ")

n = int(input())

print("Enter " +str(n)+ " Numbers: ")

nums = []

for i in range(n):

nums.insert(i, int(input()))

sum = 0

for i in range(n):

sum = sum+nums[i]

avg = sum/n

print("\nAverage = ", avg)

## Find Largest of 3 Numbers using nested if-else

print("Enter three Numbers: ")

numOne = int(input())

numTwo = int(input())

numThr = int(input())

if numOne>numTwo:

if numTwo>numThr:

large = numOne

else:

if numThr>numOne:

large = numThr

else:

large = numOne

else:

if numTwo>numThr:

large = numTwo

else:

large = numThr

print("\nLargest Number =", large)

**nPr (Permutation)**

print("Enter the Value of n: ")

n = int(input())

print("Enter the Value of r: ")

r = int(input())

fact = 1

i = 1

while i<=n:

fact = i\*fact

i = i+1

numerator = fact # n!

sub = n - r # (n-r)

fact = 1

i = 1

while i<=sub:

fact = i\*fact

i = i+1

denominator = fact # (n-r)!

perm = numerator/denominator

print("\nPermutation =", perm)

OUTPUT

Enter the value of n: 5

Enter the value of r: 1

Permutation=5

## Find nCr (Combination)

print("Enter the Value of n: ", end="")

n = int(input())

print("Enter the Value of r: ", end="")

r = int(input())

fact = i = 1

while i<=n:

fact = i\*fact

i += 1

numerator = fact

sub = n-r

fact = i = 1

while i<=sub:

fact = i\*fact

i += 1

denominator = fact

fact = i = 1

while i<=r:

fact = i\*fact

i += 1

denominator = fact\*denominator

comb = numerator/denominator

print("\nCombination (nCr) =", comb)

OUTPUT

Enter the value of n: 5

Enter the value of r: 2

Combination(nCr)=10

# Check Armstrong Number

What is an Armstrong Number ?

A number that equals to the sum of its own digits, where each digit raised to the power of number of digits. For example, 153 is an Armstrong number, because:

153 = 13 + 53 + 33

= 1 + 125 + 27

= 153

print("Enter the Number: ")

num = int(input())

temp = num

noOfDigit = 0

res = 0

while num>0:

num = int(num/10)

noOfDigit = noOfDigit+1

num = temp

while num>0:

rem = num%10

pow = 1

i = 0

while i<noOfDigit:

pow = pow\*rem

i = i+1

res = res+pow

num = int(num/10)

if res==temp:

print("\nThe number is an Armstrong Number")

else:

print("\nThe number is not an Armstrong Number")

## Find Area of Triangle based on Base and Height

print("Enter the Base Length of Triangle: ")

b = float(input())

print("Enter the Height Length Triangle: ")

h = float(input())

a = 0.5 \* b \* h

print("\nArea = ", a)

## Find LCM of Two Numbers

print("Enter Two Numbers: ")

numOne = int(input())

numTwo = int(input())

if numOne>numTwo:

lcm = numOne

else:

lcm = numTwo

while True:

if lcm%numOne==0 and lcm%numTwo==0:

break

else:

lcm = lcm + 1

print("\nLCM =", lcm)

## Find HCF (GCD) of Two Numbers

print("Enter Two Numbers: ", end="")

no = int(input())

nt = int(input())

if no>nt:

hcf = no

else:

hcf = nt

while True:

if no%hcf==0 and nt%hcf==0:

break

else:

hcf = hcf - 1

print("\nHCF (" + str(no) + ", " + str(nt) + ") = ", hcf)

print("Enter Two Numbers: ", end="")

no = int(input())

nt = int(input())

if no>nt:

hcf = no

else:

hcf = nt

while True:

if no%hcf==0 and nt%hcf==0:

break

else:

hcf = hcf - 1

print("\nHCF (" + str(no) + ", " + str(nt) + ") = ", hcf)

## Find LCM and HCF using Formula

print("Enter Two Numbers: ", end="")

no = int(input())

nt = int(input())

a = no

b = nt

while b!=0:

temp = b

b = a%b

a = temp

hcf = a

lcm = int((no\*nt)/hcf)

print("\nLCM (" + str(no) + ", " + str(nt) + ") = ", lcm)

print("HCF (" + str(no) + ", " + str(nt) + ") = ", hcf)

## Python Reverse a String

print("Enter the String: ", end="")

str = input()

strRev = str[::-1]

str = strRev

print("\nReverse =", str)

## Print Fibonacci Series up to N Term in Python

a = 0

b = 1

c = 0

print("Enter the Value of n: ", end="")

n = int(input())

print("\nFibonacci Series:", a, b, end=" ")

c = a+b

n = n-2

while n>0:

print(c, end=" ")

a = b

b = c

c = a+b

n = n-1