**Python** is a general-purpose language. It has wide range of applications from Web development (like: Django and Bottle), scientific and mathematical computing (Orange, SymPy, NumPy) to desktop graphical user Interfaces (Pygame, Panda3D).

## Python Indentation

Most of the programming languages like C, C++, Java use braces { } to define a block of code. Python uses indentation.

A code block (body of a [function](https://www.programiz.com/python-programming/function), [loop](https://www.programiz.com/python-programming/for-loop) etc.) starts with indentation and ends with the first unindented line. The amount of indentation is up to you, but it must be consistent throughout that block.

## Python Comments

Any line starting with # in Python programming is a comment.

#This is a comment

#print out Hello

print('Hello')

### Multi-line comments

Another way of doing this is to use triple quotes, either ''' or """.

These triple quotes are generally used for multi-line strings.

"""This is also a

perfect example of

multi-line comments"""

Assigning multiple values to multiple variables

a, b, c = 5, 3.2, "Hello"

print (a)

print (b)

print (c)

If we want to assign the same value to multiple variables at once, we can do this as:

x = y = z = "same"

print (x)

print (y)

print (z)

## Constants

A constant is a type of variable whose value cannot be changed.

Example 3: Declaring and assigning value to a constant

Create a constant.py

PI = 3.14

GRAVITY = 9.8

Create a main.py

import constant

print(constant.PI)

print(constant.GRAVITY)

## Rules and Naming convention for variables and constants

1. Create a name that makes sense. Suppose, vowel makes more sense than v.
2. Use camelCase notation to declare a variable. It starts with lowercase letter. For example:
3. myName
4. myAge

myAddress

1. Use capital letters where possible to declare a constant. For example:
2. PI
3. G
4. MASS

**Source Code: Add Two Numbers Provided by The User**

# Store input numbers

num1 = input('Enter first number: ')

num2 = input('Enter second number: ')

# Add two numbers

sum = float(num1) + float(num2)

# Display the sum

print('The sum of {0} and {1} is {2}'.format(num1, num2, sum))

**Output**

Enter first number: 1.5

Enter second number: 6.3

The sum of 1.5 and 6.3 is 7.8

# **Python Program to Calculate the Area of a Triangle**

# Python Program to find the area of triangle

a = 5

b = 6

c = 7

# Uncomment below to take inputs from the user

# a = float(input('Enter first side: '))

# b = float(input('Enter second side: '))

# c = float(input('Enter third side: '))

# calculate the semi-perimeter

s = (a + b + c) / 2

# calculate the area

area = (s\*(s-a)\*(s-b)\*(s-c)) \*\* 0.5

print('The area of the triangle is %0.2f' %area)

# **Python Program to Find the Largest Among Three Numbers**

# Python program to find the largest number among the three input numbers

# change the values of num1, num2 and num3

# for a different result

num1 = 10

num2 = 14

num3 = 12

# uncomment following lines to take three numbers from user

#num1 = float(input("Enter first number: "))

#num2 = float(input("Enter second number: "))

#num3 = float(input("Enter third number: "))

if (num1 >= num2) and (num1 >= num3):

largest = num1

elif (num2 >= num1) and (num2 >= num3):

largest = num2

else:

largest = num3

print("The largest number between",num1,",",num2,"and",num3,"is",largest)

## Source Code: Simple Caculator by Making Functions

# Program make a simple calculator that can add, subtract, multiply and divide using functions

# This function adds two numbers

def add(x, y):

return x + y

# This function subtracts two numbers

def subtract(x, y):

return x - y

# This function multiplies two numbers

def multiply(x, y):

return x \* y

# This function divides two numbers

def divide(x, y):

return x / y

print("Select operation.")

print("1.Add")

print("2.Subtract")

print("3.Multiply")

print("4.Divide")

# Take input from the user

choice = input("Enter choice(1/2/3/4):")

num1 = int(input("Enter first number: "))

num2 = int(input("Enter second number: "))

if choice == '1':

print(num1,"+",num2,"=", add(num1,num2))

elif choice == '2':

print(num1,"-",num2,"=", subtract(num1,num2))

elif choice == '3':

print(num1,"\*",num2,"=", multiply(num1,num2))

elif choice == '4':

print(num1,"/",num2,"=", divide(num1,num2))

else:

print("Invalid input")

**Output**

Select operation.

1.Add

2.Subtract

3.Multiply

4.Divide

Enter choice(1/2/3/4): 3

Enter first number: 15

Enter second number: 14

15 \* 14 = 210

# **Python Program to Find the Factorial of a Number**

# Python program to find the factorial of a number provided by the user.

# change the value for a different result

num = 7

# uncomment to take input from the user

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

factorial = 1

# check if the number is negative, positive or zero

if num < 0:

print("Sorry, factorial does not exist for negative numbers")

elif num == 0:

print("The factorial of 0 is 1")

else:

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

factorial = factorial\*i

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

# **Python Program to Check Prime Number**

# Python program to check if the input number is prime or not

num = 407

# take input from the user

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

# prime numbers are greater than 1

if num > 1:

# check for factors

for i in range(2,num):

if (num % i) == 0:

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

print(i,"times",num//i,"is",num)

break

else:

print(num,"is a prime number")

# if input number is less than

# or equal to 1, it is not prime

else:

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

# **Python Program to Print all Prime Numbers in an Interval**

# Python program to display all the prime numbers within an interval

# change the values of lower and upper for a different result

lower = 900

upper = 1000

# uncomment the following lines to take input from the user

#lower = int(input("Enter lower range: "))

#upper = int(input("Enter upper range: "))

print("Prime numbers between",lower,"and",upper,"are:")

for num in range(lower,upper + 1):

# prime numbers are greater than 1

if num > 1:

for i in range(2,num):

if (num % i) == 0:

break

else:

print(num)

# **Python Program to Find the Sum of Natural Numbers**

# Python program to find the sum of natural numbers up to n where n is provided by user

# change this value for a different result

num = 16

# uncomment to take input from the user

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

if num < 0:

print("Enter a positive number")

else:

sum = 0

# use while loop to iterate un till zero

while(num > 0):

sum += num

num -= 1

print("The sum is",sum)

# **Python Program to Find Armstrong Number in an Interval**

lower = 100

upper = 2000

# To take input from the user

# lower = int(input("Enter lower range: "))

# upper = int(input("Enter upper range: "))

for num in range(lower, upper + 1):

# order of number

order = len(str(num))

# initialize sum

sum = 0

# find the sum of the cube of each digit

temp = num

while temp > 0:

digit = temp % 10

sum += digit \*\* order

temp //= 10

if num == sum:

print(num)

# **Python Program to Check Armstrong Number**

# Python program to check if the number provided by the user is an Armstrong number or not

# take input from the user

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

# initialize sum

sum = 0

# find the sum of the cube of each digit

temp = num

while temp > 0:

digit = temp % 10

sum += digit \*\* 3

temp //= 10

# display the result

if num == sum:

print(num,"is an Armstrong number")

else:

print(num,"is not an Armstrong number")

# **Python Program to Count the Number of Each Vowel**

# Program to count the number of each vowel in a string

# string of vowels

vowels = 'aeiou'

# change this value for a different result

ip\_str = 'Hello, have you tried our turorial section yet?'

# uncomment to take input from the user

#ip\_str = input("Enter a string: ")

# make it suitable for caseless comparisions

ip\_str = ip\_str.casefold()

# make a dictionary with each vowel a key and value 0

count = {}.fromkeys(vowels,0)

# count the vowels

for char in ip\_str:

if char in count:

count[char] += 1

print(count)

# **Python Program to Check Whether a String is Palindrome or Not**

# Program to check if a string

# is palindrome or not

# change this value for a different output

my\_str = 'aIbohPhoBiA'

# make it suitable for caseless comparison

my\_str = my\_str.casefold()

# reverse the string

rev\_str = reversed(my\_str)

# check if the string is equal to its reverse

if list(my\_str) == list(rev\_str):

print("It is palindrome")

else:

print("It is not palindrome")

# **Python Program to Print the Fibonacci sequence**

# Program to display the Fibonacci sequence up to n-th term where n is provided by the user

# change this value for a different result

nterms = 10

# uncomment to take input from the user

#nterms = int(input("How many terms? "))

# first two terms

n1 = 0

n2 = 1

count = 0

# check if the number of terms is valid

if nterms <= 0:

print("Please enter a positive integer")

elif nterms == 1:

print("Fibonacci sequence upto",nterms,":")

print(n1)

else:

print("Fibonacci sequence upto",nterms,":")

while count < nterms:

print(n1,end=' , ')

nth = n1 + n2

# update values

n1 = n2

n2 = nth

count += 1

# **Python Program to Find the Sum of Natural Numbers**

# Python program to find the sum of natural numbers up to n where n is provided by user

# change this value for a different result

num = 16

# uncomment to take input from the user

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

if num < 0:

print("Enter a positive number")

else:

sum = 0

# use while loop to iterate un till zero

while(num > 0):

sum += num

num -= 1

print("The sum is",sum)

**Output**

The sum is 136

# **Python Program to Check if a Number is Positive, Negative or 0**

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

if num > 0:

print("Positive number")

elif num == 0:

print("Zero")

else:

print("Negative number")

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

if num >= 0:

if num == 0:

print("Zero")

else:

print("Positive number")

else:

print("Negative number")

# **Python Program to Check if a Number is Odd or Even**

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

if (num % 2) == 0:

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

else:

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

# [**Python Program to Find the Square Root**](https://www.programiz.com/python-programming/examples/square-root)

## For positive numbers using exponent \*\*

# Python Program to calculate the square root

# Note: change this value for a different result

num = 8

# uncomment to take the input from the user

#num = float(input('Enter a number: '))

num\_sqrt = num \*\* 0.5

print('The square root of %0.3f is %0.3f'%(num ,num\_sqrt))

# **Python Program to Convert Celsius To Fahrenheit**

# Python Program to convert temperature in celsius to fahrenheit

# change this value for a different result

celsius = 37.5

# calculate fahrenheit

fahrenheit = (celsius \* 1.8) + 32

print('%0.1f degree Celsius is equal to %0.1f degree Fahrenheit' %(celsius,fahrenheit))

# **Python Program to Check Leap Year**

# Python program to check if the input year is a leap year or not

year = 2000

# To get year (integer input) from the user

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

if (year % 4) == 0:

if (year % 100) == 0:

if (year % 400) == 0:

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

else:

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

else:

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

else:

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

# **Python Program to Add Two Matrices**

# Program to add two matrices using nested loop

X = [[12,7,3],

[4 ,5,6],

[7 ,8,9]]

Y = [[5,8,1],

[6,7,3],

[4,5,9]]

result = [[0,0,0],

[0,0,0],

[0,0,0]]

# iterate through rows

for i in range(len(X)):

# iterate through columns

for j in range(len(X[0])):

result[i][j] = X[i][j] + Y[i][j]

for r in result:

print(r)

# **Python Program to Transpose a Matrix**

# Program to transpose a matrix using nested loop

X = [[12,7],

[4 ,5],

[3 ,8]]

result = [[0,0,0],

[0,0,0]]

# iterate through rows

for i in range(len(X)):

# iterate through columns

for j in range(len(X[0])):

result[j][i] = X[i][j]

for r in result:

print(r)