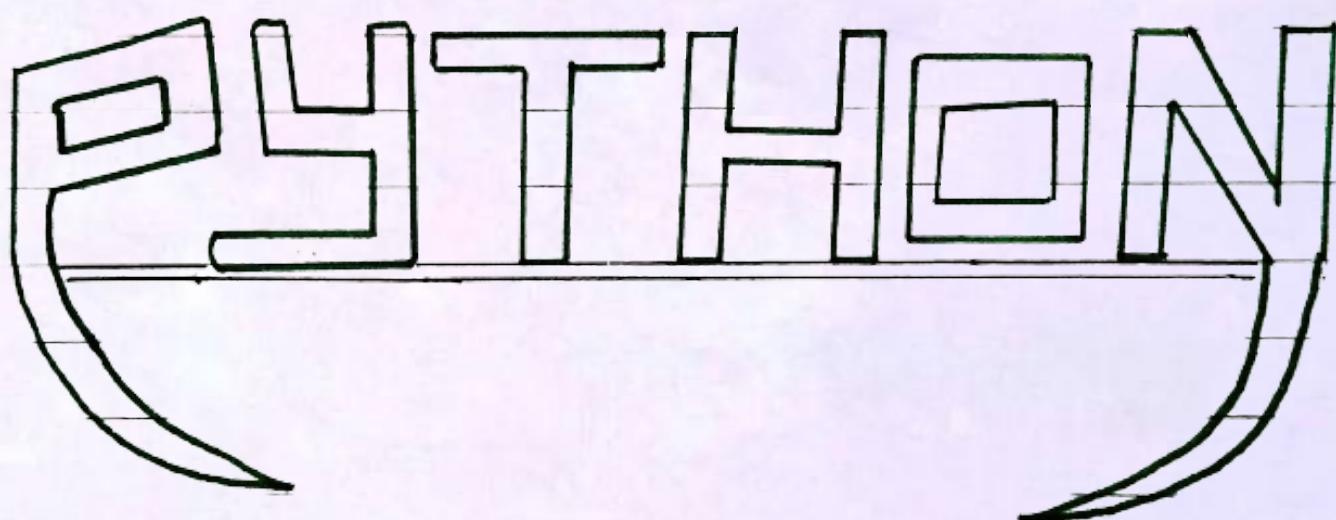


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# PYTHON

## Python Introduction :

What is Python ?

python is a popular programming language.  
It was created by Guido van Rossum, And released in 1991.

## It is used for :

- Web development ( Server-side ),
- Software development,
- Mathematics
- System Scripting

## Why can python do ?

- Python can be used on a Server to Create Web

## Applications.

- python can be used alongside software to create workflows.
- python can connect to database systems.  
It can also read and modify files.
- python can be used to handle big data and perform complex mathematics.
- python can be used for rapid prototyping, or for production-ready software development.

## Example ↴

```
print ("Hello, World")
```

## python Syntax :

### Execute Python Syntax

python syntax can be executed by writing directly in the command line.

```
>>> print ("Hello, World!")  
Hello World!
```

Or by creating a python file on the server, using the .py file extension, and running it in the command line.

```
C:\Users\your name>python  
myfile.py
```

## Python Variables

In python, variables are created when you assign a value to it.

### Example

```
x = 5
```

```
y = "Hello, World!"
```

## Comments

python has commenting capability for the purpose of in-code documentation.

Comments start with a #, and python will render the rest on the line as a comment.

Example ↴

```
# This is a comment.  
print ("Hello, World!")
```

Python Comments :

Comments can be used to explain Python code.

Comments can be used to make the code more readable.

Comments can be used to prevent execution when testing code.

Creating a Comment

Comments starts with #, and Python will ignore them.

Example ↴

```
# This  
is a comment
```

print ("Hello, World")

(x) Single

line

comment

### Multiple Comments :

Example ↴

```
# This is a comment  
# written in  
# more than just one line  
print ("Hello, World!")
```

### python Variables :

#### Creating Variables :

python has no command for declaring a variable.

A variable is created the moment you first assign a value to it.

Example ↴

x = 5

y = "John"

print(x)

print(y)

## Casting :

If you want to specify the data type of a variable, this can be done with casting.

### Example ↴

x = str(3)

# x will be '3'

y = int(3)

# y will be 3

z = float(3)

# z will be 3.0

### Get the Type

You can get the data type of a variable with the `type()` function.

### Example ↴

x = 5

y = "John"

print(type(x))



`print(type(y))`

## Single or Double Quotes?

Example ↴

`x = "John"`

# is the same as

`x = 'John'`

## Case-Sensitive :

Example ↴

`a = 4`

`A = "Sally"`

# A will not overwrite a

## Python Data Types :

### Built-in Data Types

In programming, data types is an important concept.



Variables can store data of different types, and different types can do different things.

Python has the following data types built-in by default, in these categories.

Text Type. - str

Numeric Types - int, float, complex

Sequence Types - list, tuple, range

Mapping Type - dict

Set Types - set, frozenset

Boolean Type - bool

Binary Types - bytes, bytearray, memoryview

None Type - NoneType

## Getting the Data Type :

Get the data type of any object by using the `type()` function.

### Example ↴

print the  
data type of  
the variable `x`:

`x = 5`

`print(type(x))`

## Setting the Data Type :

In python, the data types is set when you assign a value to a variable.

### Example ↴

`x = "Hello World"`

`x = 20`



x = 20.5

x = Li

x = [ "apple", "banana", "cherry" ]

x = ("apple", "banana", "cherry")

x = range(6)

x = { "name": John, "age": 36 }

x = { "apple", "banana", "cherry" }

x = frozenset({ "apple", "banana", "cherry" })

x = True

x = b"Hello"

x = bytearray(5)

x = memoryview(bytes(5))

x = None



## python numbers :

### Python numbers

There are three numeric types in python.

- int
- float
- complex

### Example ↴

```
x = 1      # int
y = 2.8    # float
z = 1j     # complex
```

### Int

Int, or integer, is a whole number, positive or negative, without decimals, of unlimited length.

### Example ↴

### Integers.

```
x = 1
```

y = 35656222554887711

z = -3255522

print(type(x))

print(type(y))

print(type(z))

## Float

Float, or "floating point number" is a number, positive or negative, containing one or more decimals.

## Example ↴

### Floats

x = 1.10

y = 1.0

z = -35.59

print(type(x))

print(type(y))

print(type(z))



## Complex

Complex numbers are written with a "j" as the imaginary part.

### Example ↴

Complex.

$$x = 3 + 5j$$

$$y = 5j$$

$$z = -5j$$

```
print(type(x))
```

```
print(type(y))
```

```
print(type(z))
```

## Type Conversion

You can convert from one type to another with the `int()`, `float()`, and `complex()` methods.

### Example ↴

Convert from one type to another.



x = 1 # int

y = 2.8 # float

z = 1j # complex

# Convert From int to float:

a = float(x)

# Convert from float to int:

b = int(y)

# Convert from int to complex:

c = complex(x)

print(a)

print(b)

print(c)

print(type(a))

print(type(b))

print(type(c))

python Strings :

(Strings)

(Strings in python are surrounded by either



Single quotation marks, or double quotation marks.

'hello' is the same as "hello".

You can display a string literal with the `print()` function.

Example ↴

```
print ("Hello")  
print ('Hello')
```

Python Modify Strings :

Python has set of built-in methods that you can use on strings.

Upper Case

Example ↴

The

`upper()`

Method returning the string in upper case.

```
a = "Hello, World!"
```

```
print(a.upper())
```

### Lower Case

#### Example ↴

The lower() method returns the string in lower case.

```
a = "Hello, World!"
```

```
print(a.lower())
```

### Remove Whitespace

Whitespace is the space before and/or after the actual text, and very often you want to remove this space.

#### Example ↴

The strip() method removes any whitespace from the beginning or the end.

```
a = "Hello, World!"
```

```
print(a.strip()) # returns "Hello, World!"
```



## Replace String

### Example ↴

The `replace()` Method replaces a String with another String.

```
a = "Hello, World!"
```

```
print(a.replace("H", "J"))
```

## Split String

The `split()` Method returns a list where the text between the specified separator becomes the list items.

### Example ↴

The `split()` Method splits the string into substrings if it finds instances of the separator.

```
a = "Hello, World!"
```

```
print(a.split(",")) # returns  
['Hello', 'World !']
```



## Python - Format - Strings

### String Format

#### Example ↴

age = 36

```
txt = "My name is John, I am " +  
      age  
print(txt)
```

### String Methods

#### Method

#### Description

capitalize()

Converts the first character to upper case

casefold()

Converts string into lower case.

center()

Returns a centered string

count()

Returns the number of times a specified



value occurs in a string.

### endswith()

Returns true if the string ends with the specified value.

### Find()

Searches the string value and returns the position of where it was found.

### Format()

Formats specified values in a string.

### index()

Searches the string for a specified value and returns the position of where it was found.

### isalnum()

Returns True if all characters in the string are alphanumeric

### isascii()

Returns True if all

Characters in the string are ascii character

isdigit()

Returns True if all characters in the string are digits.

isspace()

Returns True if all characters in the string are whitespaces.

isupper()

Returns True if all characters in the string are upper case.

join()

Joins the elements of an iterable to the end of the string

ljust()

Returns a left Justified version of the string

lower()

Converts A string into lower case

partition()

Returns a tuple where

the string is partitioned  
into three parts.

split()

Splits the strings at the  
specified separator, and  
returns a list.

strip()

Returns a trimmed  
version of the string.

upper()

Converts a string into  
upper case

## Python Booleans :

Booleans represent one of two values: True  
or False.

### Boolean Values

In programming often need to know if an  
expression is True or False.

You can evaluate any expression in python,  
and get one of two answers, True or  
False.

When you compare two values, the expression is evaluated and python returns the Boolean answer.

Example ↴

```
print(10 > 9)  
print(10 == 9)  
print(10 < 9)
```

python Operators :

python Operators

Operators are used to perform Operations on variables and values.

In the example below, we use the + operator to add together two values.

Example ↴

```
print(10 + 5)
```

## Python - Arithmetic Operators :

Arithmetic operators are used with numeric values to perform common mathematical operations.

Operator	Name	Example
+	Addition	$x+y$
-	Subtraction	$x-y$
*	Multiplication	$x*y$
/	Division	$x/y$
%	Modulus	$x \% y$
**	Exponentiation	$x^{**}y$
//	Floor division	$x//y$

## Python Assignment Operators :

Assignment operators are used to assign values to variables.

Operator

Example

Same as

=

$x = 5$

$x = 5$

$\dagger =$

$x \dagger = 3$

$x = x \dagger 3$

$- =$

$x - = 3$

$x = x - 3$

$* =$

$x * = 3$

$x = x * 3$

$/ =$

$x / = 3$

$x = x / 3$

$\% =$

$x \% = 3$

$x = x \% 3$

$// =$

$x // = 3$

$x = x // 3$

$** =$

$x ** = 3$

$x = x ** 3$

$\$ =$

$x \$ = 3$

$x = x \$ 3$

$\mid =$

$x \mid = 3$

$x = x \mid 3$

$\wedge =$

$x \wedge = 3$

$x = x \wedge 3$

$>> =$

$x >> = 3$

$x = x >> 3$



$<<=$

$x <<= 3$

$x = x << 3$

## Python - Comparison Operators :

Comparison Operators are used to compare two values.

Operator

NAME

Example

$= =$

Equal

$x = y$

$!=$

Not equal

$x \neq y$

$>$

Greater than

$x > y$

$<$

Less than

$x < y$

$\geq$

Greater than or  
equal to

$x \geq y$

$\leq$

Less than or  
equal to

$x \leq y$

## Python - Logical Operators :

Logical Operators are used to combine Conditional Statements.

Operator	Description	Example
and	Returns True if both statements are true	$x < 5$ and $x < 10$
Or	Returns True if one of the statements is true	$x < 5$ or $x < 4$
not	Reverse the result, returns False if the result is true	<code>not(x &lt; 5 and x &lt; 10)</code>

## Python - Identity Operators :

Identity Operators are used to compare the Objects, not if they are equal, but if

they are actually the same object, with the same memory location.

Operator	Description	Example
is	Returns True if both variables are the same Object	X is y

is not	Returns True if both variables are not the same object	X is not y
--------	--	------------

## Python - Membership Operators :

Membership operators are used to test if a sequence is presented in an object.

Operator	Description	Example
in	Returns True if a sequence	X in y



With the  
specified  
value is  
present in  
the project

not in

Returns True  
if a sequence

x not in y

With the  
specified  
value is  
not present  
in the  
object.

## Python - Bitwise Operators :

Bitwise Operators are used to compare (binary) numbers

Operator	Name	Description	Example
----------	------	-------------	---------

&

AND

sets each  
bit to 1 if  
both bits  
are 1

x & y

l

OR

Gets each bit to 1 if

$x \mid y$

one of two bits is 1

^

XOR

Gets each bit to 1 if only one of two bits is 1

$x \wedge y$

~

NOT

Inverts all the bits

$\sim x$

<<

Zero

Shift left by

$x << 2$

Fill left shift

pushing zeros in

from the right and let the leftmost bits fall off

>>

Signed right Shift

Shift right by pushing copies of the leftmost bit

$x >> 2$



in from the  
left, and let  
the rightmost  
bits fall off

## python Lists :

### List :

Lists are used to store multiple items in a single variable.

Lists are one of 4 built-in data types in python used to store collections of data, the other 3 are Tuple, Set and Dictionary, all with different qualities and usage.

### Example ↴

```
thislist = ["apple", "banana", "cherry"]
```

```
print(thislist)
```



## python - Access List Items :

### Access Items

List items are indexed and you can access them by referring to the index number.

Example ↴

```
print(thislist[1])
```

### Change List Items

Example ↴

```
thislist = ["apple", "banana", "cherry"]
```

```
thislist[1] = "blackcurrant"
```

```
print(thislist)
```

### Add List Items

### Append Items

Example ↴

```
thislist.append("Orange")
```



print (thislist)

### Remove List Items

The remove() Method removes the Specified item.

Example ↴

```
thislist.remove("banana")  
print (thislist)
```

### Loop Lists

Example ↴

```
for x in thislist:
```

```
    print (x)
```

### List Comprehension

Example ↴

Fruits

```
= ["apple", "banana", "cherry", "kiwi", "Mango"]
```

```
newlist = []
```



for x in fruits :

if "a" in x:

newlist.append(x)

print(newlist)

## python Lists

Example ↴

print(thislist)

## Sort Lists

Example ↴

thislist.sort()

print(thislist)

## Copy Lists

Example ↴

mylist = thislist.copy()

print(mylist)



## Join Lists

Example ↴

```
list1 = ["a", "b", "c"]  
list2 = [1, 2, 3]
```

```
List3 = list1 + list2
```

```
print(List3)
```

## List Methods

Method

Description

append()

Adds an element at the end of the list

clear()

Removes all the elements from the list

copy()

Returns a copy of the list

count()

Returns the number of elements with the Specified value.



extend()

Add the elements of a list to the end of the current list

index()

Returns the index of the first element with the specified value.

insert()

Adds an element at the specified position.

pop()

Removes the element at the specified position.

remove()

Removes the item with the specified value.

reverse()

Reverses the order of the list

Sort()

Sorts the list

Python Tuples :

Tuple : Tuples are used to store multiple items in a single variable.



Tuple is one of 4 built-in data types in python used to store collections of data, the other 3 are List, Set and Dictionary. all with different qualities and usage.

A tuple is collection which is ordered and unchangeable.

Tuples are written with round brackets.

### Example ↴

```
thistuple = ("apple", "banana", "cherry")  
print(thistuple)
```

### Access Tuple Items:

#### Example ↴

```
thistuple = ("apple", "banana", "cherry")  
print(thistuple[1])
```

### Update Tuples

Example → x = ("apple", "banana", "cherry")



y = list(x)

y[1] = "kiwi"

x = tuple(y)

print(x)

## Unpack Tuples

### Example ↴

Fruits = ("apple", "banana", "cherry")

## Loop Tuples

### Loop through a Tuple

### Example ↴

for x in thistuple:

print(x)

## Join Tuples

Example → tuple1 = ("a", "b", "c")

tuple2 = (1, 2, 3)



```
tuple3 = tuple1 + tuple2  
print(tuple3)
```

## Tuple Methods

Method	Description
count()	Returns the number of times a specified value occurs "in a tuple."
index()	Searches the tuple for a specified value and returns the position of where it was found.

## Python Sets :

### Set :

Sets are used to store multiple items in a single variables.

A set is a collection which is unordered, unchangeable,\* and unindexed.



Example ↴

```
print(thisset)
```

Access (Set Items) :

Access Items

Example ↴

```
thisset = {"apple", "banana", "cherry"}
```

```
for x in thisset
```

```
    print(x)
```

Add (Set Items) :

Add Items

Example ↴

```
thisset.add("orange")
```

```
print(thisset)
```



## Remove Set Items

Example ↴

```
thisset.remove("banana")
```

```
print(thisset)
```

## Loop Sets

Example ↴

```
for x in thisset:
```

```
    print(x)
```

## Join Sets

Example ↴

```
Set1 = {"a", "b", "c"}
```

```
Set2 = {1, 2, 3}
```

```
Set3 = Set1.union(Set2)
```

```
print(Set3)
```



## Set Methods

### Method

### Description

add()

Adds an element  
to the set

clear()

Removes all the elements  
from the set

copy()

Returns a copy of the  
set

difference()

Returns a set containing the  
difference between two  
or more sets.

difference\_update()

Removes the items in this  
set that are also included  
in another, specified set

discard()

Remove the specified  
item.

intersection()

Returns a set, that is  
the intersection of two



## Other Sets.

isdisjoint()

Returns whether two sets have a intersection or not.

issubset()

Returns whether another set contains this set or not.

pop()

Removes an element from the element

union()

Return a set containing the union of sets.

update()

Update the set with the union of this set and others.

## Python Dictionaries:

### Dictionary

Dictionaries are used to store data values in key:value pairs.

A dictionary is a collection which is ordered\*, changeable and do not allow duplicates.

### Example ↴

```
thisdict = {  
    "brand": "Ford",  
    "Model": "Mustang",  
    "year": 1964}
```

```
print(thisdict)
```

### Access Dictionary Items

### Example ↴

```
thisdict = {  
    "brand": "Ford",
```

"model": "Mustang",  
"year": 1964.  
}

x = thisdict ["model"]

### Change Items

#### Example ↴

thisdict = {  
 "brand": "ford",  
 "Model": "Mustang",  
 "year": 1964  
}

thisdict ["year"] = 2018

### Adding Items

Adding an item to the dictionary is done by using a new index key and assign a value to it.

#### Example ↴

thisdic

t = {

```
"brand": "Ford",
"Model": "Mustang",
"year": 1964
}
```

```
thisdict["color"] = "red"
print(thisdict)
```

## Remove Items

### Example ↴

The `pop()`  
Method

Removes the item with the Specified Key name.

```
thisdict = {
    "brand": "Ford",
    "Model": "Mustang",
    "year": 1964
}
```

```
thisdict.pop("model")
print(thisdict)
```

## Dictionary Methods

python has a set of built-in methods that

You can use on dictionaries.

### Method

### Description

`clear()`

Removes all the elements from the dictionary.

`copy()`

Returns a copy of the dictionary.

`fromkeys()`

Returns a dictionary with the specified keys and value.

`get()`

Returns the value of the Specified key.

`items()`

Returns a list containing a tuple for each key value pair.

`keys()`

Returns a list containing the dictionary's keys

`.pop()`

Removes the element with



the specified key.

popitem()

Removes the last inserted key-value pair

.setdefault()

Returns the value of the specified key. If the key does not exist: insert the key, with the specified value.

update()

Updates the dictionary with the specified key-value pairs.

Returns a list of all the values in the dictionary.

python If...Else

python Conditions and If Statements

Python supports the usual logical conditions from Mathematics.

- Equals :  $a == b$

- Not Equals :  $a \neq b$
- Less than :  $a < b$
- Less than or equal to :  $a \leq b$
- Greater than :  $a > b$
- Greater than or equal to :  $a \geq b$

These Conditions can be used in Several ways, most commonly in "If Statements" and loops.

An "IF Statement" is written by using the if keyword

Example:

$a = 33$

$b = 200$

If  $b > a$ :

```
print("b is greater than a")
```

While Loops

Python Loops

Python has two primitive loop commands.



- While loops
- For loops

## The While Loop

With the While loop we can execute a set of statements as long as a condition is true.

Example →

i = 1

while i < 6 :

    print(i)

    i += 1

## Python For Loops :

A For loop is used for iterating over a sequence (that is either a list, a tuple, a dictionary, a set , or a string).

This is like the for keyword in other programming languages , and works more like an iterator method as found in other object - orientated programming languages.

With **for** loop we can execute a set of statements, once for each item in a list, tuple, set etc.

### Example ↴

```
fruits = ["apple", "banana", "cherry"]
for x in fruits:
    print(x)
```

### Python Functions :

A function is a block of code which only runs when it called.

pass data, known as parameters, into a function.

A function can return data as a result.

### Creating a Function

```
def my_function():
    print("Hello from a function")
```



## Calling a Function

Example ↴

```
def my_function():
    print("Hello from a function")
```

```
my_function()
```

## Arguments

Arguments are specified after the function name, inside the parentheses. You can add as many arguments as you want, just separate them with a comma.

The following example has a function with one argument (fname). When the function is called, we pass along a first name, which is used inside the function to print the full name.

Example ↴

```
def my_function(fname):
    print(fname + " Refsnes")
```



my\_function ("Emil")  
my\_function ("Tobias")  
my\_function ("Linus")

### Returns values

To let a function return a value, use the  
return statement

### Example ↴

```
def my_function(x):  
    return 5 * x  
  
print(my_function(3))  
print(my_function(5))  
print(my_function(9))
```

### python Arrays:

What is Array?

An array is a special variable, which can hold more than one value at a time.

If you have a list of items (a list of car names, for example), storing the cars in



Single variables could look like this.

Car1 = "Ford"

Car2 = "Volvo"

Car3 = "BMW"

## Access the Elements of An Array

Example ↴

Get the value of the first array item.

`x = cars[0]`

Example ↴

Modify the value of first Array item.

`cars[0] = "Toyota"`

## Length of An Array

Use the `len()` Method to return the length of an array

Example → `x = len(cars)`

## Looping Array Elements

Use the `for in` loop to loop through all the elements of an array.

### Example ↴

Print each item in the `Cars` array.

```
for x in Cars:
```

```
    print(x)
```

## Adding Array Elements

Use the `append()` method to add an element to an array.

### Example ↴

Add one more element to the `Cars` array:

```
Cars.append("Honda")
```

## Removing Array Elements



Use the `pop()` Method to Remove an element From the array.

Example ↴

Delete the second element of the `cars` array:

`Cars.pop(1)`

Example ↴

Delete the element that has the value "volvo":

`Cars.remove("Volvo")`

Python classes / Objects

Python is an object oriented programming language.

Almost everything in python is an object, with its properties and methods.

A class is like an object constructor, or a "blueprint" for creating objects.



## Create a class

To create a class, use the keyword `class`.

Example ↴

Create a

class named

`MyClass`, with a property named `x`:

`class MyClass :`

`x = 5`

## Create Object

Now we use the class named `MyClass` to create objects.

Example ↴

Create an object named `p1`, and print the value of `x`.

`p1 = MyClass()`

`print(p1.x)`



## The \_\_init\_\_() Function

### Example ↴

Create a class named Person, use the \_\_init\_\_() function to assign values for name and age.

class Person:

    def \_\_init\_\_(self, name, age):

        self.name = name

        self.age = age

p1 = Person("John", 36)

print(p1.name)

print(p1.age)

## Python Inheritance

Inheritance allows us to define a class that inherits all the methods and properties from another class.

Parent class is the class being inherited from, also called base class.



child class is the class that inherits from another class, also called derived class.

### Create a Parent Class

#### Example ↴

Class person :

```
def __init__(self, fname, lname):  
    self.firstname = fname  
    self.lastname = lname
```

```
def printname(self):  
    print(self.firstname,  
          self.lastname)
```

# Use the person class to create an object, and then execute the printname method:

```
x = person("John", "Doe")  
x.printname()
```

### Create a child class

To create a class that inherits the functionality



From another class, send the parent class as a parameter when creating the child class.

Example ↴

Create a class named `Student`, which will inherit the properties and methods from the `Person` class.

`class Student(Person):`  
    pass

## Python Polymorphism

The word "polymorphism" means "many forms", and in programming it refers to methods/functions/operators with the same name that can be executed on many objects or classes.

### Function polymorphism

An example of a python function that can be used on different objects is the `len()` function.



## String

for Strings len() returns the number of characteristics:

### Example ↴

```
x = "Hello World!"
```

```
print (len (x))
```

## Tuple

### Example ↴

```
mytuple = ("apple", "banana", "cherry")
```

```
print (len (mytuple))
```

## Dictionary

Dictionaries len() returns the number the value pairs in the dictionary.

### Example ↴

```
thisdict = {
```



"brand": "Ford",  
"Model": "Mustang",  
"year": 1964

{

print(len(thisdict))

## Local Scope

A variable created inside a function belongs to the local scope of that function, and can only be used inside that function.

### Example ↴

```
def my_func():
    x = 300
    print(x)
```

my\_func()

## Global Scope

A variable created in the main body of the python



code is a global variable and belongs to the global scope.

Global variables are available from within any scope, global and local.

Example ↴

A variable created outside of a function is global and can be used by anyone.

`x = 300`

`def myfunc():`

`print`

`myfunc()`

`print(x)`

Global keyword

If you need to create a global variable, but are stuck in the local scope, you can use the **global keyword**

The **global** keyword makes the variable global.

Example ↴

```
def myfunc():
    global x
    x = 300
```

myfunc()

print(x)

## The Math Module

Python has also a built-in module called **Math**, which extends the lists of Mathematical functions.

To use it, you must import the **Math** module.

import Math

The **Math.sqrt()** Method for example, returns the square root of a Number.

Example ↴

import Math



`x = Math.sqrt(64)`

`print(x)`

Example ↴

`x = Math.ceil(1.4)`

`y = Math.floor(1.4)`

`Print(x) # return 2`

`Print(y) returns 1`

Python JSON

python has a built-in package called json.  
which can be used to work with JSON data.

Example ↴

Import the json module.

`import json`

## Parse JSON - Convert From JSON to python

Example ↴

```
import json
```

```
# Some JSON:
```

```
x = '{ "name": "John", "age": 30,  
      "city": "New York"}'
```

```
# parse x:
```

```
y = json.loads(x)
```

```
# the result is a python dictionary:
```

```
print(y["age"])
```

## Convert From python to JSON

Example ↴

```
Convert From python to JSON:
```

```
import json
```

```
# a python object (dict):
```



```
x = {  
    "name": "John",  
    "age": 30,  
    "city": "New York"  
}
```

# convert into JSON

```
y = json.dumps(x)
```

# the result is a JSON string:

```
print(y)
```

## Python Try Except

The try block lets you test a block of code for errors.

The except block lets you handle the error.

The else block lets you execute code when there is no error.

The finally block lets you execute code, regardless of the result of the try - and except blocks.

## Exception Handling

When an error occurs, or exception as we call it, python will normally stop and generate an error message.

### Example ↴

```
try:  
    f = open ("demofile.txt")  
    try:  
        f.write ("Lorem Ipsum")  
    except:  
        print ("Something went wrong when  
writing to the file")  
    finally:  
        f.close ()  
except:  
    print ("Something went wrong when  
opening the file")
```

## Python File Operation

A file is a named location used for storing data. For example, Main.py is a file that is always used to store python code.



## Opening Files in python

In python, we need to open a file first to perform any operations on it - we use the `open()` function to do so. Let's look at an example.

### Example ↴

```
file1 = open ("file1.txt")
```

## Reading Files in python

After we open a file, we use the `read()` method to read its content.

### Example ↴

```
# open a file in read mode
```

```
file1 = open ("file1.txt")
```

```
# read this file content
```

```
read_content = file1.read ()
```

```
print (read_content)
```



## Writing to files in python

To write to a python file, we need to open it in write mode using the `w` parameter.

### Example ↴

```
# open the file2.txt in write mode
```

```
file2 = open ('file2.txt', 'w')
```

```
# Write contents to the file2.txt file
```

```
file2.write ('programming is fun.\n')
```

```
file2.write ('programiz for beginners\n')
```

## Closing Files in python

When we are done performing operations on the file, we need to close the file properly. We use the `close()` function to close a file in Python.

### Example ↴

```
# Open a file
```

```
file1 = open ("file1.txt", "r")
```

# read the file at end of file

read\_content = file1.read()

print(read\_content)

# close the file

file1.close()