IntelliPaat

Python Tutorial for Beginners

Agenda for Today's Session

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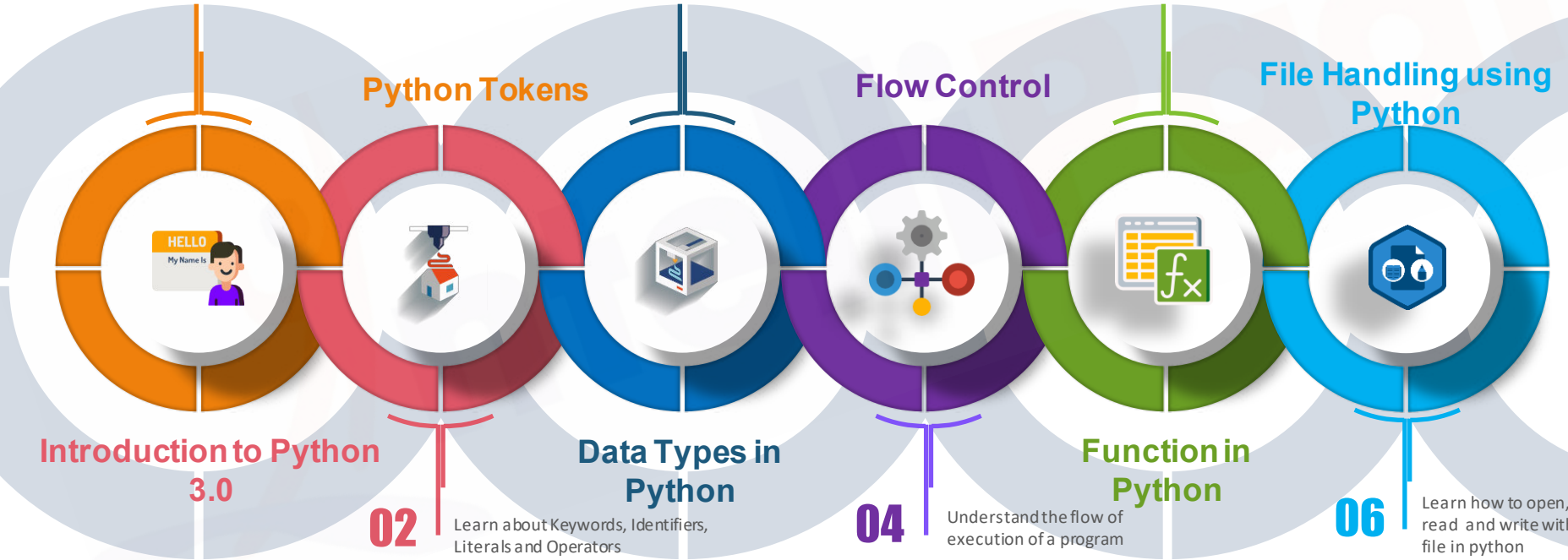

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Introduction To Python

Do you know who created Python?

Created in 1991 by **Guido van Rossum**

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Introduction To Python

Ever wondered Why is it named Python?

Named after **Monty's Python Flying Circus**

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Introduction To Python

Why should YOU learn Python?

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Python can be used in lot of places…

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Popularity of Python in Industry…

Google

Dropbox

BitTorrent

NASA

NETFLIX

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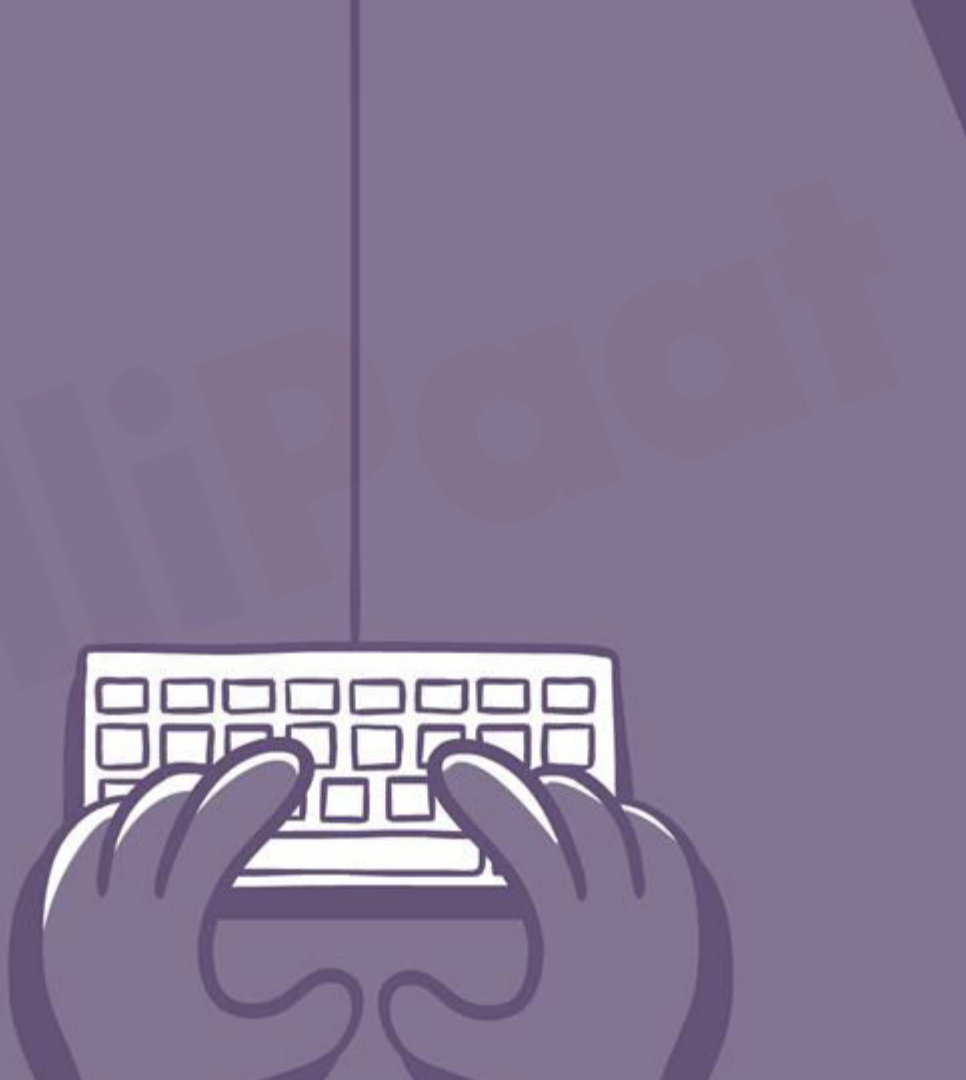
Installing Python



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Python: Variable

- Assigning value
- Multiple assignment

Assigning single value to a variable…

Input

```
>>>a = 10
>>>name = ‘Victor’
>>>salary = 2000.23
>>>print (a)
>>>print (name)
>>>print (salary)
```

Output

```
>>>10
>>>Victor
>>>2000.23
```

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Python: Variable

Assigning value

Multiple assignment

Assigning multiple value to a variable…

Input

```
>>>a=b=c=10
>>>x,y,z=10,20,30
>>>print (y)
>>>print (a)
```

Output

```
>>>20
>>>10
```

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Python: Tokens

- Keywords
- Identifiers
- Literals
- Operators

What are Keywords?

- Python Keywords are special reserved words
- Convey a special meaning to the compiler/interpreter
- Each keyword have a special meaning and a specific operation
- **NEVER** use it as a variable

True	False	None	and	as
asset	def	class	continue	break
else	finally	elif	del	except
global	for	if	from	import
raise	try	or	return	pass
nonlocal	in	not	is	lambda

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Python: Tokens

- Keywords
- Identifiers
- Literals
- Operators

What are Identifiers?

Identifiers are the name used to identify a variable, function, class or an object

RULES defined for naming an Identifiers:

- No special character except underscore (_) can be used as an identifier
- Keyword should not be used as an identifier name
- Python is case sensitive, i.e Var and var are two different identifier
- First character of an identifier can be character, underscore (_) but not digit

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Python: Tokens

- Keywords
- Identifiers
- Literals
- Operators

Literals: Constant used in Python…

- String Literals
- Numeric Literals
- Boolean Literals
- Special Literals

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Literals in Python

- String Literals
- Numeric Literals
- Boolean Literals
- Special Literals

What are String Literals?

- Formed by enclosing a text in the quotes
- Both single and double quotes can be used

Input

```
>>>name1="John"
>>>name2='James'
>>>print(name1)
>>>print(name2)
>>>text1='hello\
World'
>>>text1
>>>multiline='''st1
...st2
...st3'''
```

Output

```
'helloWorld'
John
James
st1
st2
st3
```

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Literals in Python

- String Literals
- Numeric Literals
- Boolean Literals
- Special Literals

What are Numeric Literals?

Int	Long	Float	Complex
+ve and –ve numbers(integers) with no fractional part. Ex: 100,-234	Unlimited integer size followed by upper or lowercase L. Ex: 233424243L	Real numbers with both integer and fractional part Ex: -213.3	In the form of a+bj. ‘a’ forms the real part & b forms the imaginary part. Ex: 3.14j

- In Python, value of an integer is not restricted by the number of bits and can expand to the limit of the available memory
- No special arrangement is required for storing large numbers

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Literals in Python

- String Literals
- Numeric Literals
- Boolean Literals
- Special Literals

What are Boolean Literals?

Can have only two values:

- True
- False

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Literals in Python

- String Literals
- Numeric Literals
- Boolean Literals
- Special Literals

What are Special Literals?

Python has one special literal: None

Used to specify to the field that is not created

Example

```
>>> val1=10
>>> val2=None
>>> val1
10
>>> val2
>>> print(val2)
None
>>>
```

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Operators in Python

- Keywords
- Identifiers
- Literals
- Operators

Types of Operators…

- Arithmetic Operator
- Assignment Operator
- Comparison Operator
- Logical Operator
- Bitwise Operator
- Identity Operator
- Membership Operator

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Operators in Python

- Arithmetic Operator
- Assignment Operator
- Comparison Operator
- Logical Operator
- Bitwise Operator
- Identity Operator
- Membership Operator

Takes two operand to perform operations on them

Operators

`+, -, *, /, %`

Example

```
>>>1+2
3
>>>1-2
-1
>>>2%1
0
```

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Operators in Python

- Arithmetic Operator
- Assignment Operator
- Comparison Operator
- Logical Operator
- Bitwise Operator
- Identity Operator
- Membership Operator

Assign a value to a variable

Operators

```
=,+=, -=, *=
```

Example

```
>>>a=10
>>>a*=10 #a=10*10
>>>print(a)
100
```

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Operators in Python

- Arithmetic Operator
- Assignment Operator
- Comparison Operator
- Logical Operator
- Bitwise Operator
- Identity Operator
- Membership Operator

Compare two values and returns true or false as output

Operators

```
=,+=, -=, *=
```

Example

```
>>>a=10
>>>a*=10 #a=10*10
>>>print(a)
100
```

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Operators in Python

- Arithmetic Operator
- Assignment Operator
- Comparison Operator
- Logical Operator
- Bitwise Operator
- Identity Operator
- Membership Operator

Used to compare two values and returns true or false as output

Operators

```
and, or , not
```

Example

```
>>> a=10<10 and 2>-1
>>> print(a)
False
```

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Operators in Python

- Arithmetic Operator
- Assignment Operator
- Comparison Operator
- Logical Operator
- **Bitwise Operator**
- Identity Operator
- Membership Operator

Used to perform bitwise calculation

Operators

```
&, | , >>, <<, ~
```

Example

```
>>>7 | 5
7
>>>7&5
5
```

How it is calculated?

```
111     7
101     5
---------
111     7
```

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Operators in Python

- Arithmetic Operator
- Assignment Operator
- Comparison Operator
- Logical Operator
- Bitwise Operator
- Identity Operator
- Membership Operator

Test if the two operands share an identity

Operators

```
is, is not
```

Example

```
>>>x = 10
>>>x is 10
True
>>>x = 10
>>>x is not 10
False
```

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Operators in Python

- Arithmetic Operator
- Assignment Operator
- Comparison Operator
- Logical Operator
- Bitwise Operator
- Identity Operator
- Membership Operator

Test whether a value is a member of a sequence

Operators

```
in, not in
```

Example

```
>>>pets=['dog','cat','wolf']
>>>'lion' in pets
False
>>>'wolf' in pets
True
>>>'me' in 'appointment'
True
```

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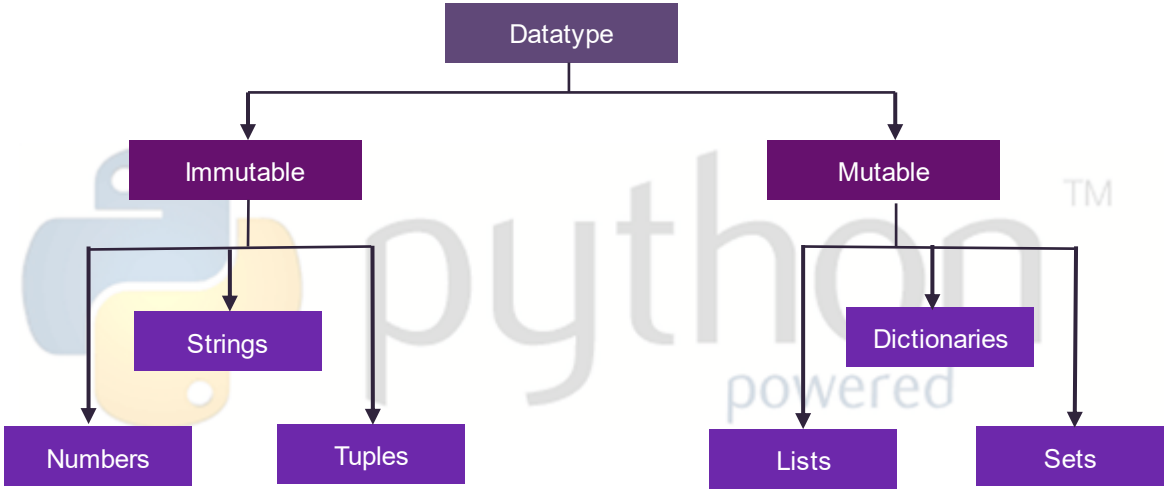
Python: Datatype



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Datatypes in Python

- Numbers
- Strings
- Tuples
- Lists
- Dictionaries
- Sets

Example

```
message = “Hello World"
num = 1234
rate = 13.6
print(type(message)) #return a string
print(type(n)) #return an integer
print(type(pi)) #return a float
```

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Datatypes in Python

- Numbers
- Strings
- Tuples
- Lists
- Dictionaries
- Sets

Example

```
var1 = 'Hello-World!'
var2 = 'PythonTutorial’

print(var1[0]) # prints the first
character in the string `H`
print(var2[1:5]) # prints the
substring ‘ytho`
```

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Datatypes in Python

- Numbers
- Strings
- Tuples
- Lists
- Dictionaries
- Sets

- find()
- replace()
- split()
- count()

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Datatypes in Python

- Numbers
- Strings
- Tuples
- Lists
- Dictionaries
- Sets

Tuples are a group of values within ( )

Example

```
>>>myGroup = (‘a’, ‘b', ‘c', ‘d’)
```

repetation

indexing

slicing

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Datatypes in Python

- Numbers
- Strings
- Tuples
- Lists
- Dictionaries
- Sets

Tuples are a group of values within [ ]

Example

```
>>>myGroup = ('a', 10, 7.12, 'data')
```

- concatenation
- repetation
- slicing
- extend
- insert

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Datatypes in Python

- Numbers
- Strings
- Tuples
- Lists
- Dictionaries
- Sets

Tuples are a group of values within ( )

Example

```
myDict = { 1: 'John' , 2: 'Bob', 3: 'Alice' }
```

Key

Value

- empty dictionary
- Integer keys
- mixed keys
- paring
- accessing dictionary

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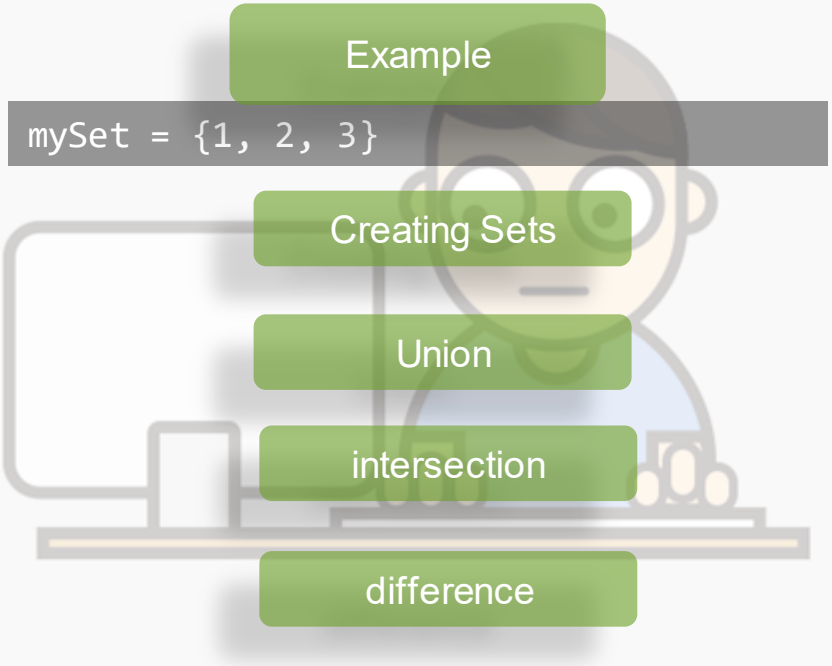
Datatypes in Python

- Numbers
- Strings
- Tuples
- Lists
- Dictionaries
- Sets

Unordered collection of items within { }



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Python: Test Yourself

Q.1 What would be the output of the following code?

Fill the missing code

```
test1 = 'PythonProgramming'
print(test1[2:6])
```

Note: Post your answer in the comment section below

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Python: Flow Control

Defines the flow of the execution of program…

- if-else
- Nested if-else
- for
- while
- break
- continue

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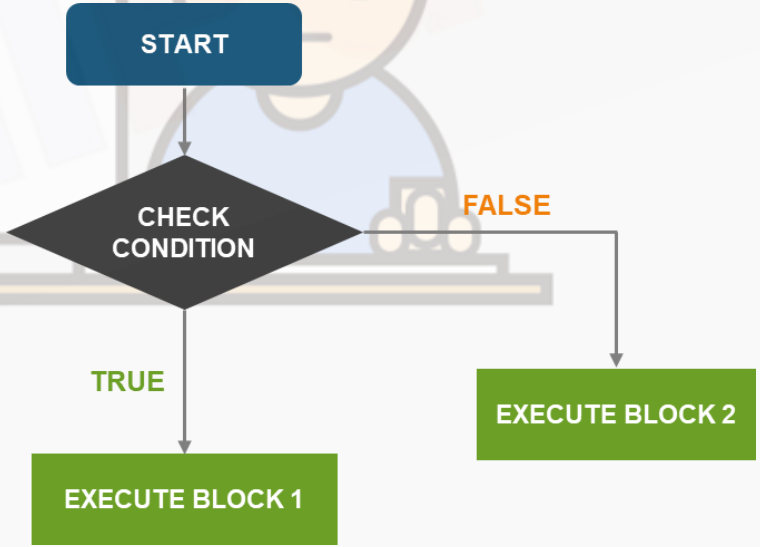
Python: Flow Control

- if-else
- Nested if-else
- for
- while
- break
- continue

Syntax

```
if (condition):
        statements 1
…
    else:
        statements 2
…
```



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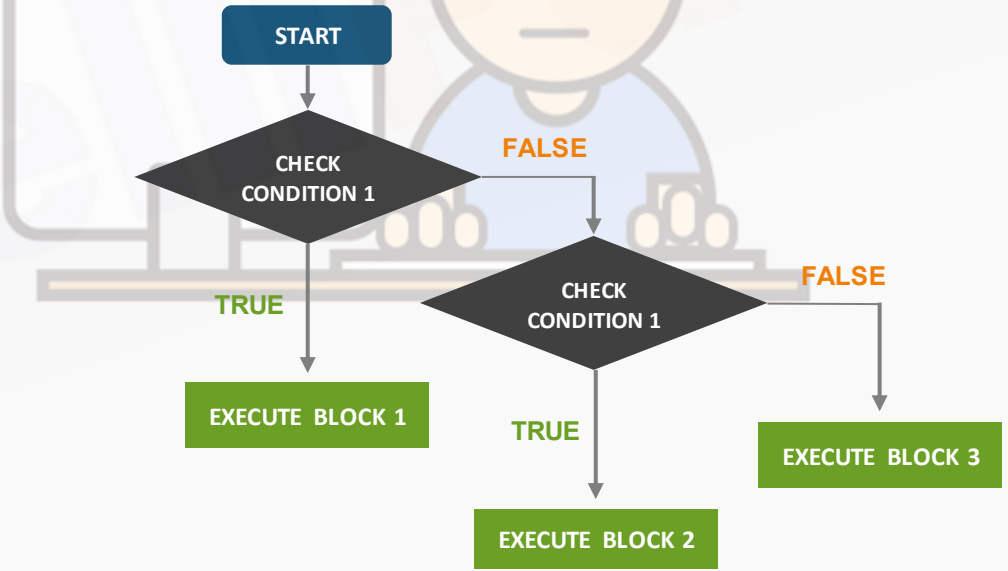
Python: Flow Control

- if-else
- Nested if-else
- for
- while
- break
- continue

Syntax

```
if (condition 1):
        statements 1 …
    elif (condition 2):
        statements 2 …
    else
         statements 3 …
```



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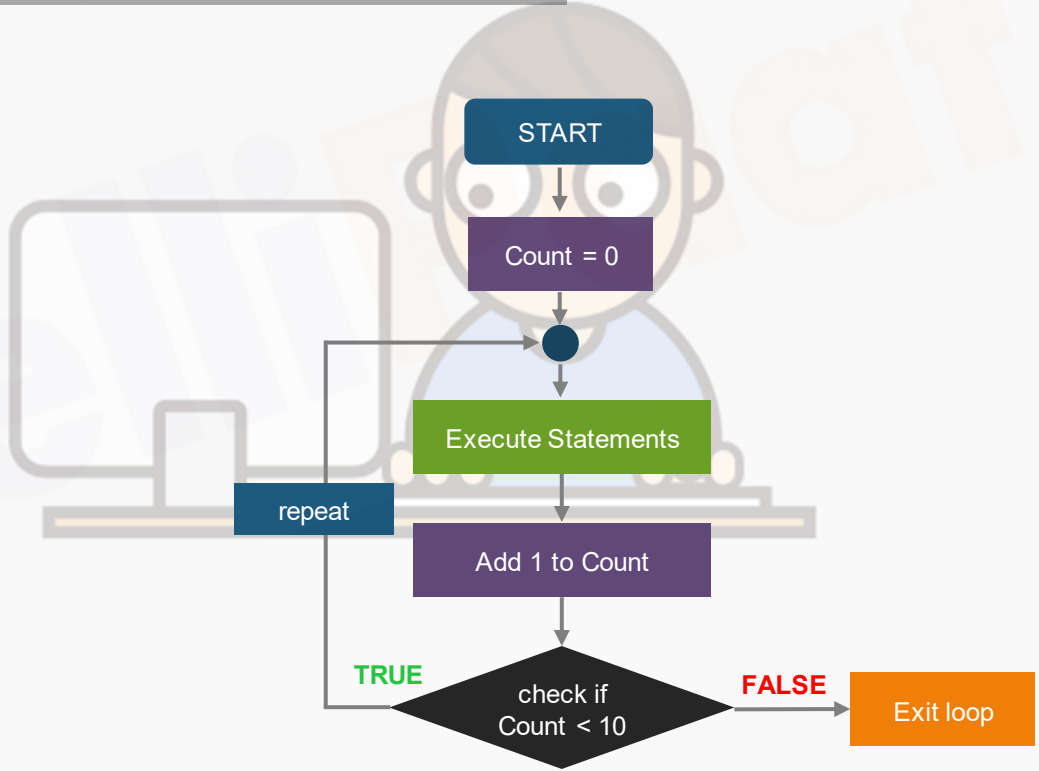
Python: Flow Control

- if-else
- Nested if-else
- for
- while
- break
- continue

Syntax

```
for iterating_var in sequence:
execute statements
```



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Python: Flow Control

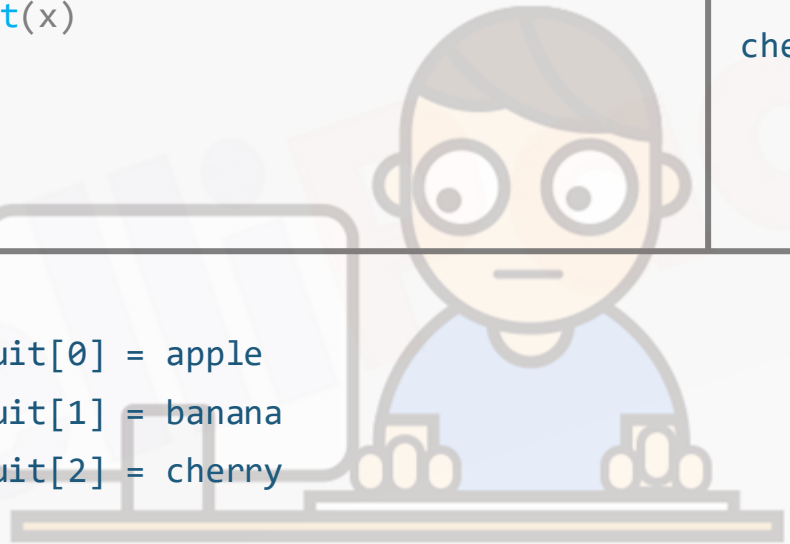
- if-else
- Nested if-else
- for
- while
- break
- continue

code

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

output

```
apple
banana
cheery
```



variable

```
x in fruit[0] = apple
x in fruit[1] = banana
x in fruit[2] = cherry
```

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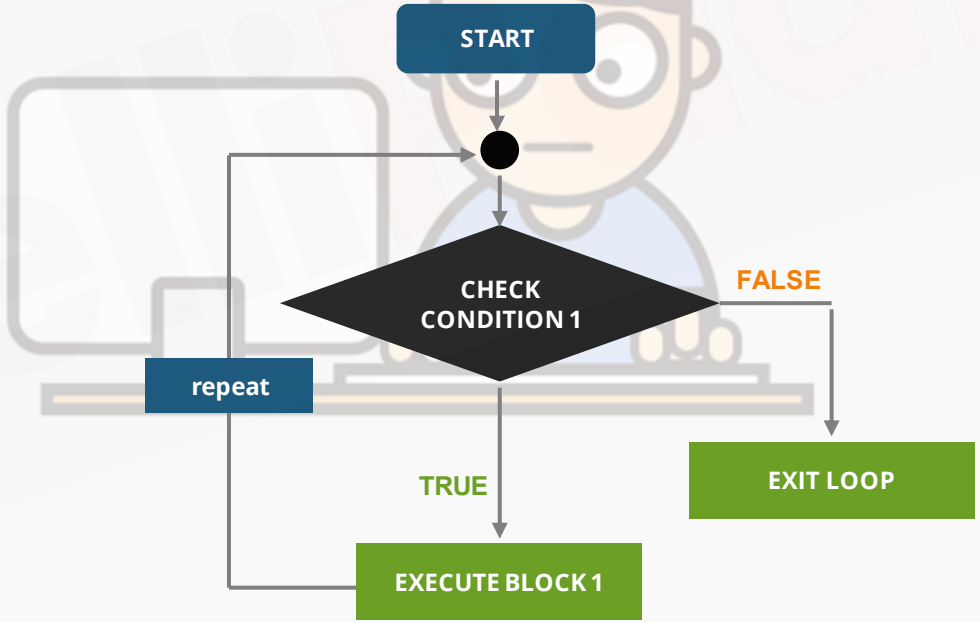
Python: Flow Control

- if-else
- Nested if-else
- for
- while
- break
- continue

Syntax

```
while (condition is True):
    statements1…
```



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Python: Flow Control

- if-else
- Nested if-else
- for
- **while**
- break
- continue

code

```
1  a = 1
2  while a<5:
3   print(a)
4   a+=2
```

output

```
1
3
```

variable

```
a = 1   is less than 5
a = a+2= 1+2= 3
a = 3   is less than 5
a = 5   is less than 5
```

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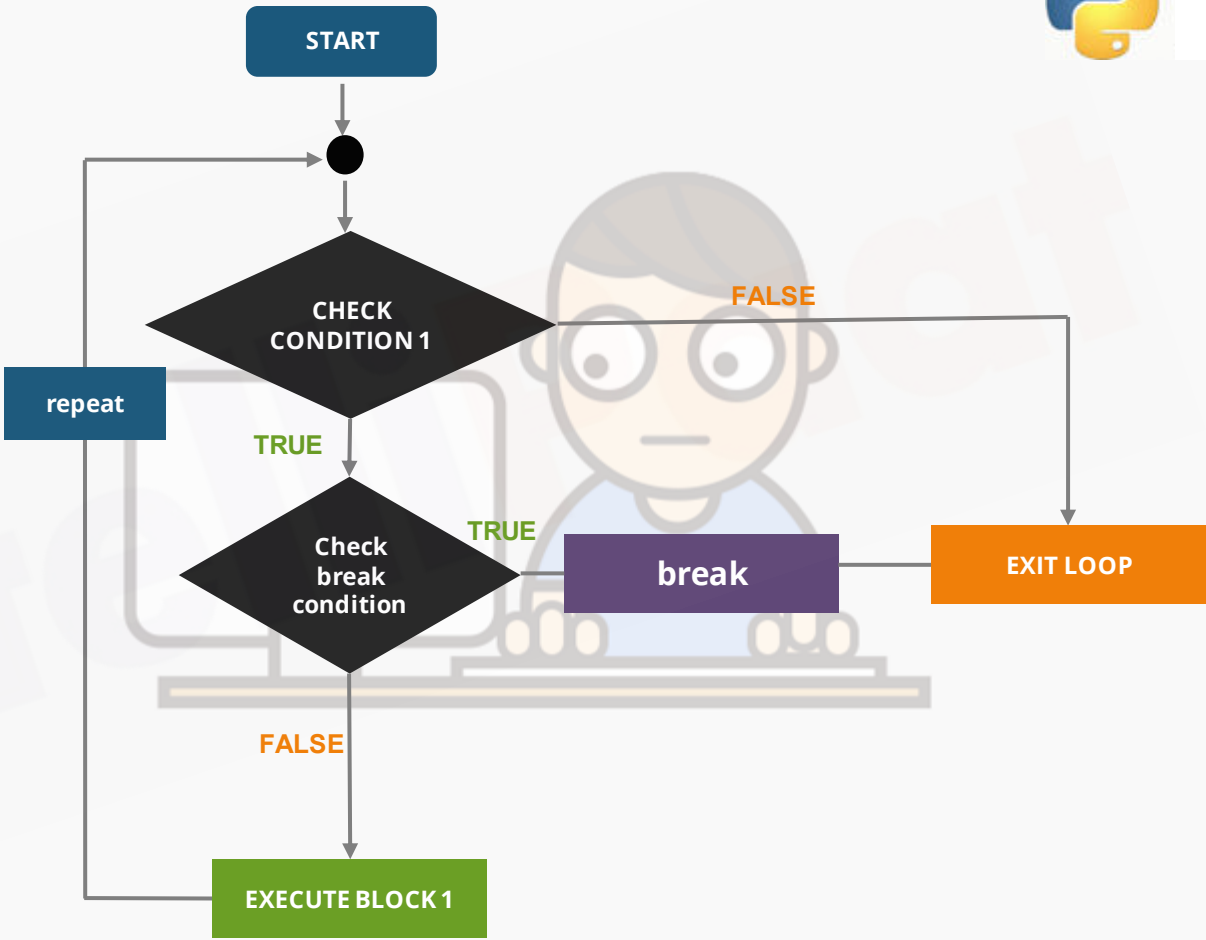
Python: Flow Control

- if-else
- Nested if-else
- for
- while
- **break**
- continue



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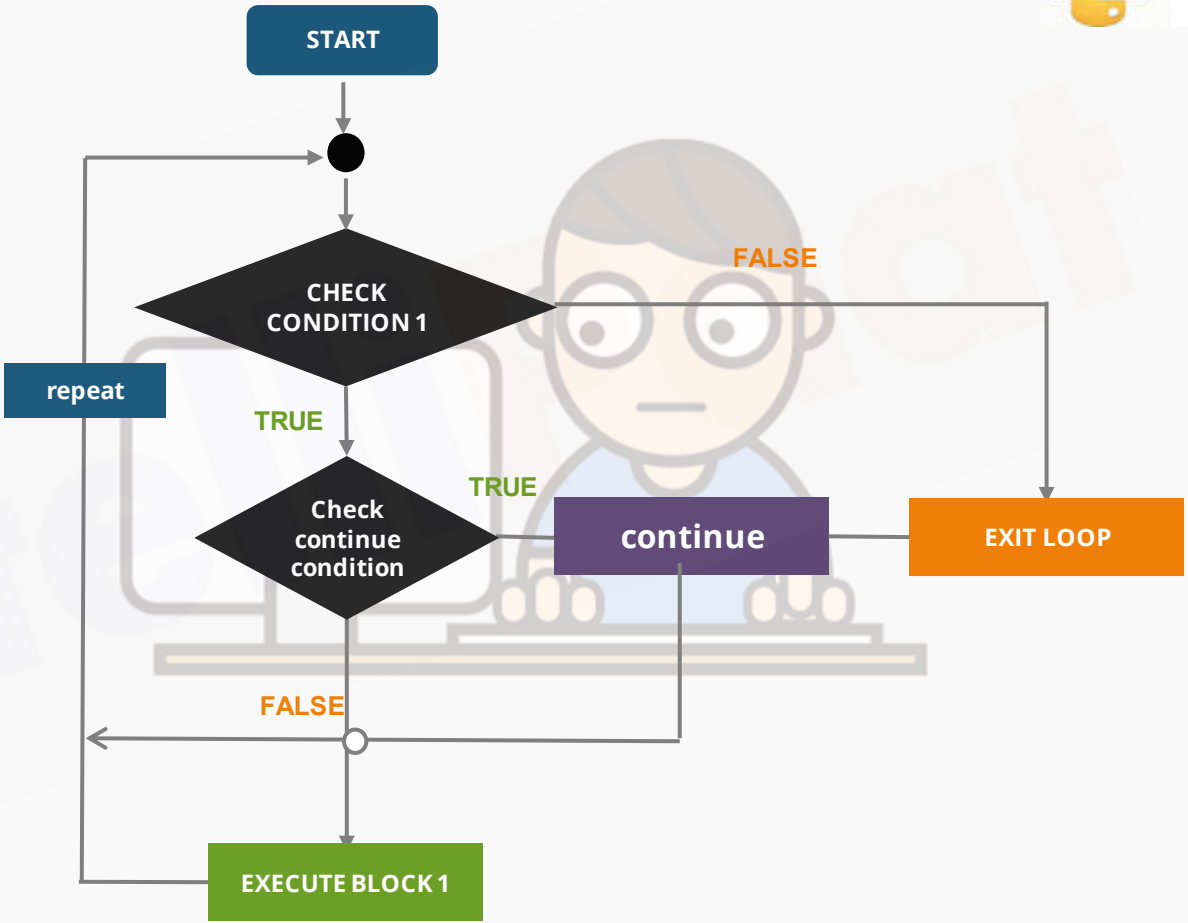
Python: Flow Control

- if-else
- Nested if-else
- for
- while
- break
- continue



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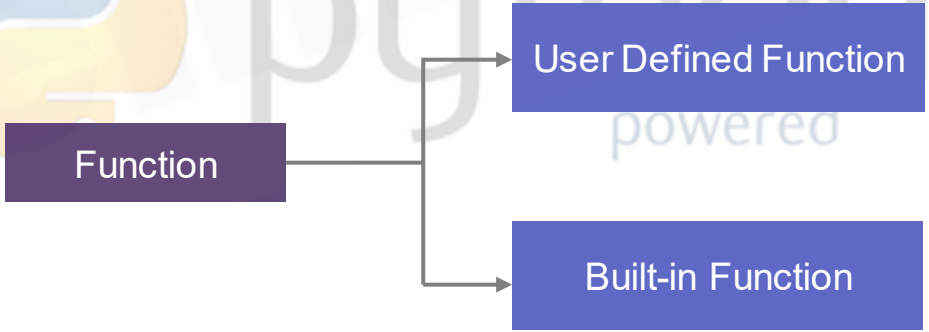
Python: Function

What are functions?

A function is a block of organized, reusable sets of instructions that is used to perform some related actions



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Python: Function

User Defined Function

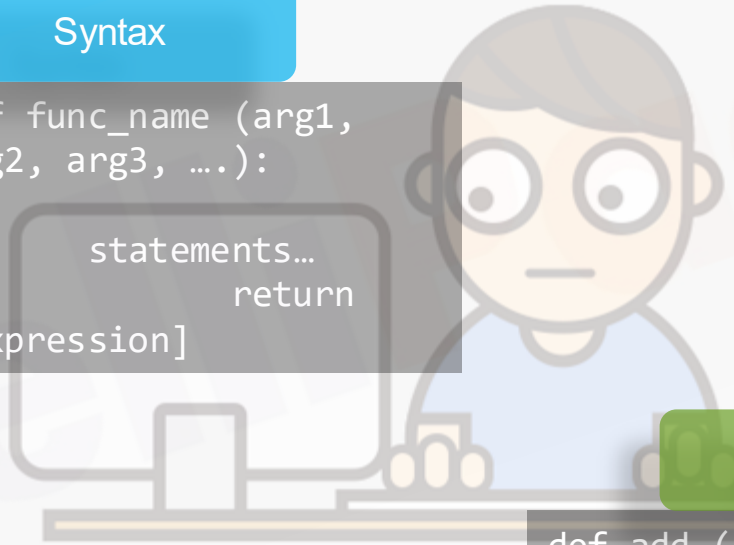
Built-in Function

How to define a function?

Syntax

```
def func_name (arg1,
arg2, arg3, ….):

        statements…
                return
[expression]
```



Example

```
def add ( a, b )
  sum = a + b
  return sum
```

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Python: Function

User Defined Function

Built-in Function

How to define a function?

- abs(): Returns the absolute value of a number
- all(): Returns True if all items in an iterable object are true
- any(): Returns True if any item in an iterable object is true
- ascii(): Returns a readable version of an object. Replaces non-ascii characters with escape character
- bin(): Returns the binary version of a number
- bool(): Returns the Boolean value of the specified object

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Python: Function

Calling the defined function…

Pass by Value

Pass by Reference

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Python: Function Call

Pass by Value

Pass by Reference

Calling a function by passing the value…

Example

```
>>>a=10
>>>def ChangeIt(b):
…                print(“value of b is”, b)
…                b=100
…                print(“New value of b is”, b)
…
>>>ChangeIt(a)
```

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Python: Function Call

Pass by Value

Pass by Reference

Calling a function by passing the value…

Example

```
>>>c=[10,20,30]
>>>def ChangeThem(d):
…                print("value of d is", d)
…                d[0]=99
…                d[1]=98
…                print("New value of d is", d)
…
>>>ChangeThem(c)
```

Python: Function Call

Pass by Value

Pass by Reference

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Python: Test Yourself

Q.2 Following function takes two parameters and print the first one. Fill the missing code:

Fill the missing code

```
def my_function(fname, lname):
print(.....)
```

Note: Post your answer in the comment section below

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Python: Test Yourself

Q.3 A function which return the x parameter + 10.

Fill the missing code:

Fill the missing code

```
def my_function(x):
……..
……..
……
```

Note: Post your answer in the comment section below

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Python: Test Yourself

Q.4 What is the output of ..

Output??

```
fruits = ("apple", "banana", "cherry")
if “mango" in fruits:
  print(3+4)
else
  print(2*2)
```

Note: Post your answer in the comment section below

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Python: Lambda

What is Lambda Function?

Anonymous function, i.e a function having no name

Syntax

```
lambda arguments : expression
```

Example

```
x = lambda a : a + 10
print(x(5))
```

Note: Lambda function cannot contain more than one expression

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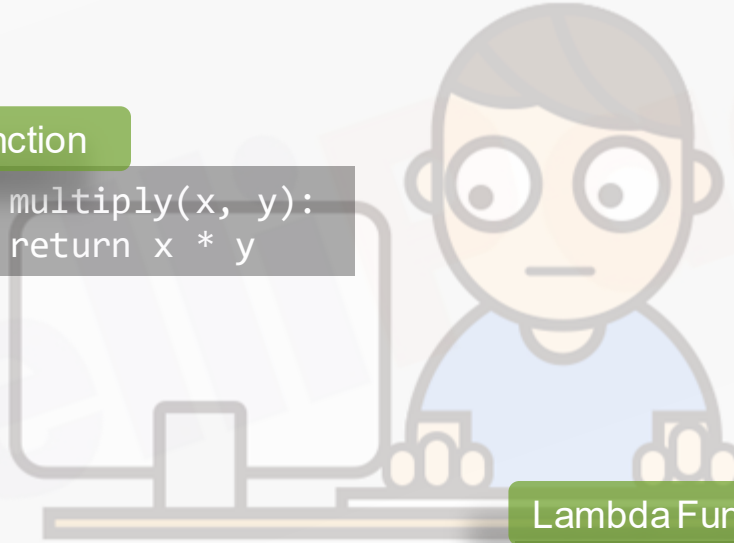
Python: Lambda

Function vs Lambda Function

Function

```
def multiply(x, y):
    return x * y
```



Lambda Function

```
r = lambda x, y: x * y
r(12, 3)   # call the
lambda function
```

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Python: Lambda

Power of Lambda: Anonymous Function inside another function…

Example

```
def myfunc(n):
  return lambda a : a + n
mySum = myfunc(3)
print(mySum(10))
```

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Python: Test Yourself

Q.5 Write a lambda function that sums argument a, b, and c and print the result

Note: Post your answer in the comment section below

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Python: Test Yourself

Q.6 What is the output of ..

Output??

```
def myfunc(n):
  return lambda a : a * n
mydoubler = myfunc(2)
print(mydoubler(11))
```

Note: Post your answer in the comment section below

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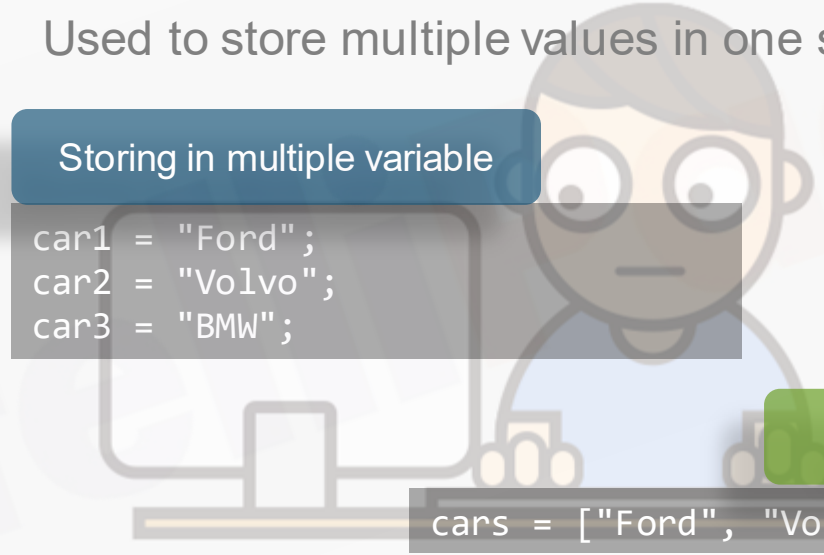
Python: Arrays

What is an Array?

Used to store multiple values in one single variable.

Storing in multiple variable

```
car1 = "Ford";
car2 = "Volvo";
car3 = "BMW";
```



Using Array

```
cars = ["Ford", "Volvo", "BMW"]
```

Note: Python does not have built-in support for Arrays, but Python lists can be used instead.

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Python: Arrays

Accessing the element

```
>>>x = cars[0]
Ford
```

Modifying the element

```
>>>cars[0] = “Honda”
>>>print(cars[0])
Honda
```

Length of array

```
>>>x = len(cars)
3
```

Looping the Array

```
for x in cars:
  print(x)
```

Adding the element

```
>>>cars.append(“Opel")]
>>>print(len(cars))
4
```

Removing one element

```
>>>cars.pop(1)
```

Removing specific element

```
cars.remove("Volvo")
```

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Python: Classes/Object

What is a class and an object in Python?

- Python is an object-oriented programming language
- Almost everything in Python is an object, with its properties and methods
- A Class is like a "blueprint" for creating objects

Class

```
class MyClass:
  x = 5
```

Object

```
obj1 = MyClass()
print(obj1.x)
```

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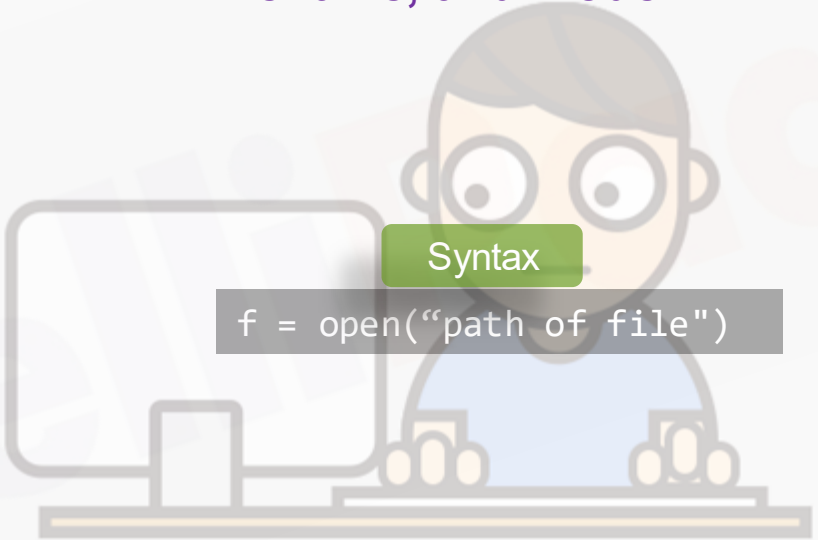
Python: File Handling

- Open
- Read
- Write/Create
- Delete

The open() function takes two parameters; filename, and mode.



Syntax

```
f = open("path of file")
```

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Python: File Handling

- Open
- Read
- Write/Create
- Delete

- **"r" - Read** - Default value. Opens a file for reading, error if the file does not exist
- **"a" - Append** - Opens a file for appending, creates the file if it does not exist
- **"w" - Write** - Opens a file for writing, creates the file if it does not exist
- **"x" - Create** - Creates the specified file, returns an error if the file with same name exists

Example

```
f = open("path of file","rt")
```

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Python: File Handling

- Open
- Read
- Write/Create
- Delete

Example

```
f = open("demofile.txt", "r")
print(f.read())
```

Reading parts of file

```
f = open("demofile.txt", "r")
print(f.read(5)) #Return the 5 first
characters of the file
```

Reading first line

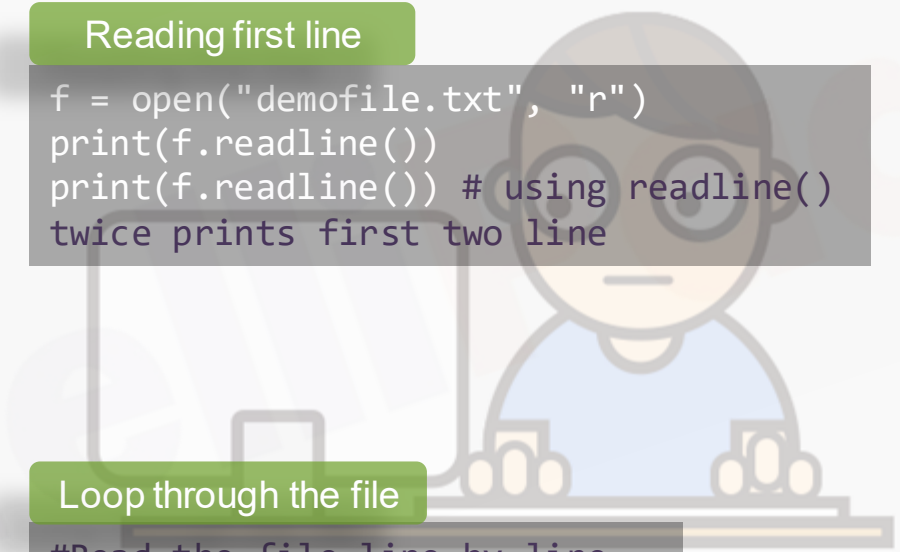
```
f = open("demofile.txt", "r")
print(f.readline()) #readline() is
used to return one line
```

Python: File Handling

- Open
- Read
- Write/Create
- Delete

Reading first line

```
f = open("demofile.txt", "r")
print(f.readline())
print(f.readline()) # using readline()
twice prints first two line
```



Loop through the file

```
#Read the file line by line
f = open("demofile.txt", "r")
for x in f:
  print(x)
```

Python: File Handling

- Open
- Read
- Write/Create
- Delete

To write to an existing file, you must add a parameter to the open() function

- **"a" - Append** – will append to the end of the file
- **"w" - Write** – will overwrite any existing content

Example: Append

```
f = open("demofile.txt", "a")
f.write("Now the file has one more line!")
```

Example: Overwrite

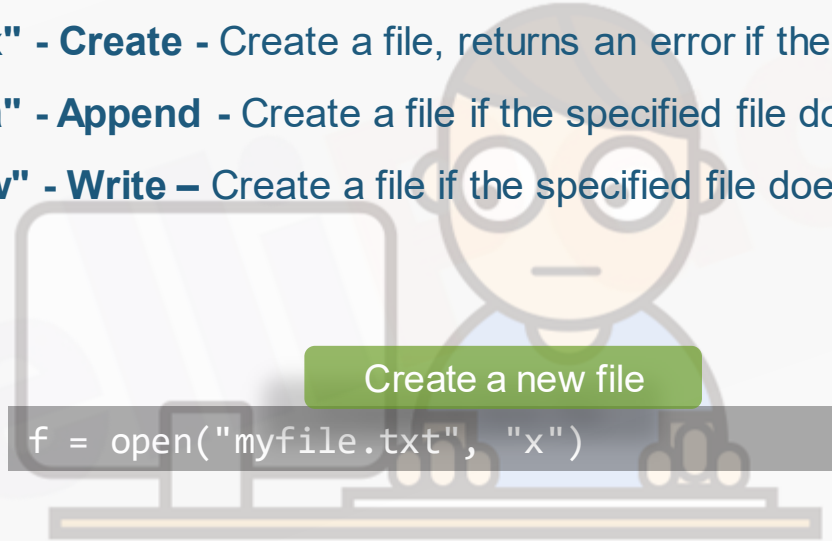
```
f = open("demofile.txt", "w")
f.write("Woops! I have deleted the content!")
```

Python: File Handling

- Open
- Read
- Write/Create
- Delete

Creating a new file…

- **"x" - Create -** Create a file, returns an error if the file exist
- **"a" - Append -** Create a file if the specified file does not exist
- **"w" - Write –** Create a file if the specified file does not exist



Create a new file

```
f = open("myfile.txt", "x")
```

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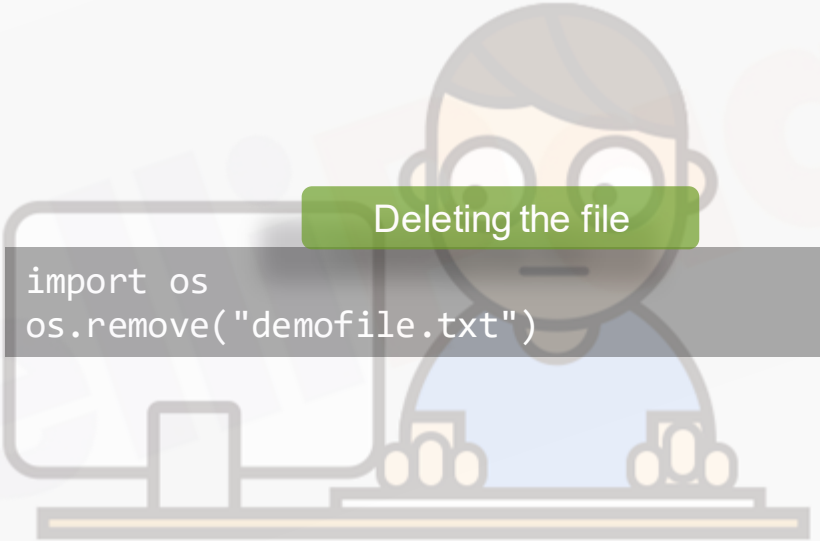
Python: File Handling

- Open
- Read
- Write/Create
- Delete

Import OS module to delete a file…



Deleting the file

```
import os
os.remove("demofile.txt")
```

QUIZ

Quiz 1

Where did the Python name come from?

A	Python Snake
B	Monty Python's Circus Flying
C	Monty Python's Flying Circus
D	None of the above

Answer 1

1.Where did the Python name come from?

A	a)Python Snake
B	a)Monty Python’s Circus Flying
C	a)Monty Python’s Flying Circus
D	a)None of the above

Quiz 2

1.Which among the following can be an identifier in Python?

A	a)@HEllo
B	a)1hello
C	a)$Hello1
D	a)_Hello1

Answer 2

1.Which among the following can be an identifier in Python?

A	a)@HEllo
B	a)1hello
C	a)$Hello1
D	a)_Hello1

Quiz 3

1.What is the output of the following

2.4 | 6

A	a)4
B	a)6
C	a)10
D	a)1

Answer 3

1.What is the output of the following

2.4 | 6

A	a)4
B	a)6
C	a)10
D	a)1

Quiz 4

1.What is the output of the following

10<<1

A	a)10
B	a)1
C	a)20
D	a)None of the above

Answer 4

1.What is the output of the following

10<<1

A	a)10
B	a)1
C	a)20
D	a)None of the above

Quiz 5

1.Which of the following is going to throw an exception out of the following?

A	a)A = 10
B	a)int A = 10
C	a)Name = "Noah"
D	a)Name = 'Noah'

Answer 5

1.Which of the following is going to throw an exception out of the following?

A	a)A = 10
B	a)int A = 10
C	a)Name = "Noah"
D	a)Name = 'Noah'

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