Introducti to Python

Part I

Let us understand some terminologies regarding computer programming.

Program: An ordered set of instructions to be executed by a computer to carry out specific task.

Programming language: The language used to specify this set of instructions to th computer.

Machine language: The computer understand the language of 0s and 1s which is c machine language or low-level language.

High-level programming language: Programming languages like Python, C++, Ja are easier to manage by humans but are not directly understood by the computer.

Source code: A program written in a high-level language is called the source code.

Let us understand some terminologies regarding computer programming.

Compiler and Interpreter: Program that translates the source code to machine language. Python uses an interpreter to convert its instructions machine language, so that it can be understood by the computer.

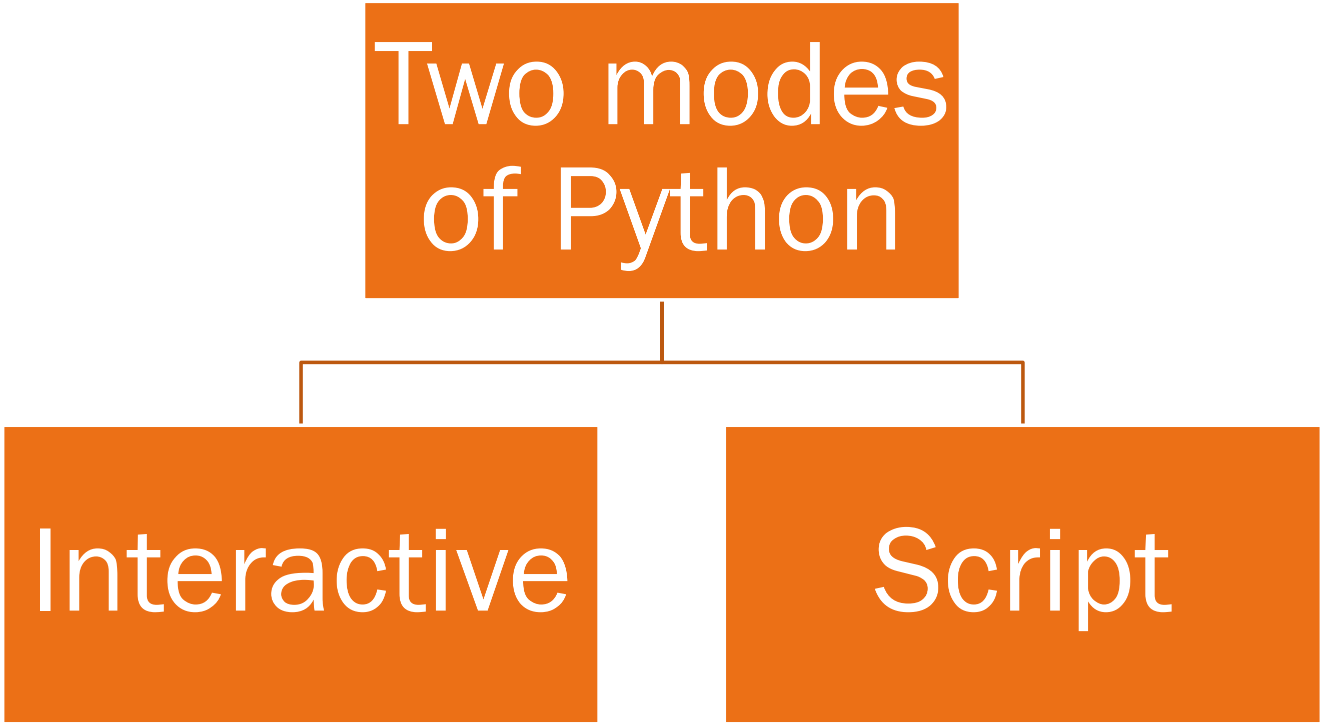
Compiler	**Interpreter**
Acompiler translates the entire source code, as a whole, into the object code. After scanning the whole program, it generates error messages, if any. A compiler is faster than Interpreter.	An interpreter processes the pro statements one by one, first translating and then executing. T process is continued until an err is encountered or the whole pro is executed successfully.

Features of Python

Python is a high level language. It is a free and open source language.

- It is an interpreted language, as Python programs are executed by an interpreter.
- Python programs are easy to understand as they have a clearly defined syntax and relatively simple structure.
- Python is case-sensitive. For example, **NUMBER** and **number** are no same in Python.
- Python is portable and platform independent, means it can run on vari operating systems and hardware platforms.
- Python has a rich library of predefined functions.
- Python is also helpful in web development. Many popular web service applications are built using Python.
- Python uses indentation for blocks and nested blocks.

Working with Python



Two modes of Python

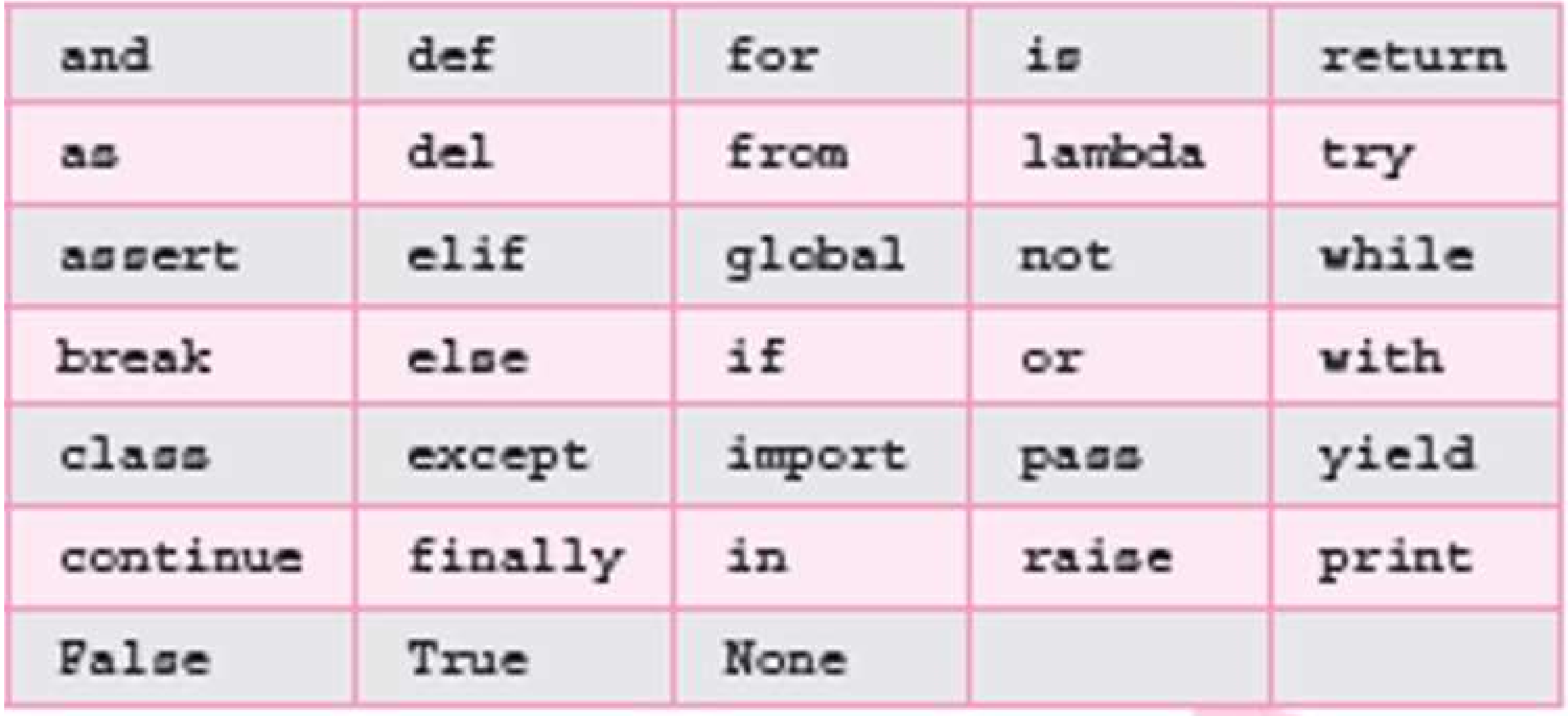
Interactive

Script

1. Click **File > New File**
2. This opens the Script m
3. Type the program.
4. **File > Save** to save the program.
5. It is saved with .py exte
6. **Run > Run Module** to program and get the ou
7. The output will appear Interactive mode.

Python Keywords

Keywords are the reserved words. Keyword has a specific meaning to t
Python interpreter and we can use a keyword in our program only for th
purpose for which it has been defined.



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

Identifiers

Identifiers are names used to identify a variable, function, or o
entities in a program. The rules for naming an identifier in Pyt
are as follows:

- The name should begin with an uppercase or a lowercase alphabet or an undersc
(_)sign. This may be followed by any combination of characters a–z, A–Z, 0–9 or
underscore (_).
- An identifier cannot start with a digit.
- It can be of any length. (However, it is preferred to keep it short and meaningful).
- It should not be a keyword or reserved word.
- It cannot contain special symbols like !, @, #, $, %, etc.

Identifiers

Identifiers should have a informative name.

For example, to find the average of marks obtained by a student in thre
subjects, we can choose the identifiers as **marks1, marks2, marks3** an
rather than a, b, c, or A, B, C.
avg = (marks1 + marks2 + marks3)/3

Similarly, to calculate the area of a rectangle, we can use identifier nam
such as area, length, breadth instead of single alphabets as identifiers fo
clarity and more readability.
area = length * breadth

Variables

A variable in a program is uniquely identified by a name (identifier).

Variable in Python refers to an object — an item or element that is store
the memory.

Value of a variable can be a
string (e.g., ‘b’, ‘Global Citizen’),
numeric (e.g., 345) or
any combination of alphanumeric characters (CD67).

In Python we can use an assignment statement to create new variables a
assign specific values to them.

```
gender = 'M'
message = "Keep Smiling"
price = 987.9
```

Comments

Comments are used to explain the programming code. Python ignores comments, and so will not execute code.

Single line comment

```
# This is the single line comment in Python
```

Inline comment

```
print(“Hello World”) # This prints on the screen
```

Multiple lines comment:

Comments spanning multiple lines have “ “ “ or ‘ ‘ ‘ on either side.
This is the same as a multiline string, but they can be used as comments.

```
“ “ “
This type of comment spans multiple lines.
These are mostly used for documentation
“ “ “
```

Everything as an object

Python treats every value or data item whether numeric, string, or other type (discu
the next section) as an object in the sense that it can be assigned to some variable or
passed to a function as an argument.

Every object in Python is assigned a unique identity (ID) which remains the same f
lifetime of that object.

This ID is the to the memory address of the object. The function id() returns the ide
an object.

```
>>> num1 = 20
>>> id(num1)
1433920576                  #identity of num1
>>> num2 = 30 - 10
>>> id(num2)
1433920576          #identity of num2 and num1are same as both refers to object 20
```

Thank
You
Alan