What is Python?

Python is free and simple to learn. Its primary features are that it is *high-level*, *dynamically typed* and *interpreted*. This makes *debugging* of errors easy and encourages the rapid development of application prototypes, marking itself as the language to code with. Python was developed in **1989** by Guido Van Rossum and emphasizes on the **DRY** (Don't Repeat Yourself) principle and readability.

Founder:

Guido Van Rossum

Python Features/Advantages:

- *Easy Syntax* – No semicolons, No Curly Braces
- *Readable* - Easy to use & Learn
- *Platform Independent* – Can be used cross-platform
- *Dynamically Typed* – No need to specify data type of variable
- *Free and Open Source* – We don't have to pay money to any organization to use Python
- *Follows Multiple Paradigms* – like Procedure Oriented, Functional, Imperative
- *Supports OOP as well*
- *Extensible/Integrated* – Can be used with C,C++
- *Large Library Collection* – Plenty of third party modules & Predefined functions
- *Powerful Web Frameworks* – like Flask, Django.

Limitations:

- *Backward Incompatible* - Python 2.x program can't be executed in Python 3.x
- *Slow* – Compared to C/C++
- *Weak in case of mobile development*

History of Python:

- Conceived by *Guido Van Rossum* in 1989.
- Influenced by Languages like – ABC, Modula-3
- Python 1.x -1994
- Python 2.x -2000
- Python 3.x -2008
- Python 3.8.0 -2019

Python Applications:

Web Development

Game Development

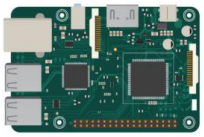
Machine Learning and AI

Data Science and Data Visualization

Desktop GUI

Business Applications

Embedded Applications



Where Python is used in Industry?

Whether Python is Interpreted or Compiled?

We'll discuss in depth about it in the upcoming sessions.

Compiler:

A compiler is a computer program that transforms (translates) source code of a programming language (the source language) into another computer language (the target language). In most cases compilers are used to transform source code into executable program, i.e. they translate code from high-level programming languages into low (or lower) level languages, mostly assembly or machine code.

Interpreter:

An interpreter is a computer program that executes instructions written in a programming language. It can either execute the source code directly or translate the source code in a first step into a more efficient representation and execute this code.

Steps to compile .py file:

1) Python code is translated into intermediate code

2) Python virtual machine run intermediate code.

3) We can compile manually python program.

----------cmd----------

6) *python -m py_compile <filename>.py*

7) *python -m compileall*

Variables / Identifiers in Python:

- We can use variables to store values, they are like containers.
- Identifier is the 'name' given to an entity like variable, class or function.
- Rules for defining identifiers:
  - *Must start with a letter or the underscore character.*
    Valid: _cjc, Cjc, cjc. Invalid: 1cjc
  - *Can only contain alpha-numeric characters and underscores.*
    Valid: cjc12, cjc_1. Invalid: cjc&12, cjc#, @cjc
  - *Python is Case Sensitive Programming Language.*

Keywords in Python:

These are the reserved words in Python.

We cannot use a keyword as a identifier.

There are 35 keywords in Python 3.8.0 as of now.

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