Python for Beginners

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Programming languages

To instruct the computers to perform some sort of actions

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Low-level **high-level**

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Object-**O**riented **L**anguage
C++, C#, Java, Python

Why Python(3) ?

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Key features:

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(no compilation required before execution)

Interactive

(direct interaction with python prompt)

Object Oriented Programming supported

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- Defining a function
- Flow when calling a function
- Parameters and arguments
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Reading/Writing Files

- Files and directories in Python
- Reading from a file
- Parsing data
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Modules and Import

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  Datetime module
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  Generators and decorators
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Object Oriented Programming

- Introduction to OOPs
- Attributes and Class keywords
- Inheritance and Polymorphism

Statistical analysis of data with Python

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Identifiers: is a name, to identify *variable*, *function*, *module*….

Keywords: predefined words, that has specific meaning and can't be use as constants, variables or other identifier names.

Variables:

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DATA types & structure

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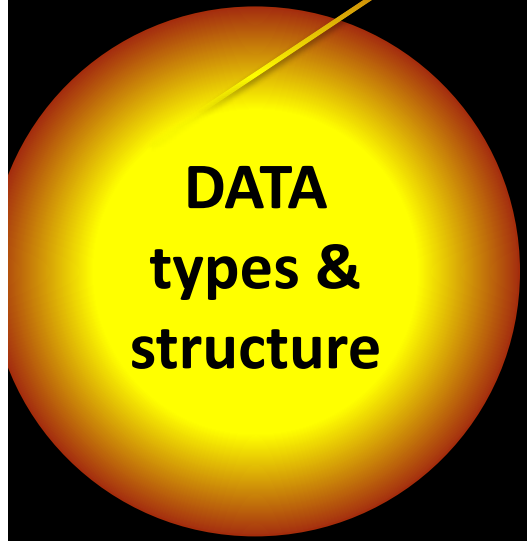

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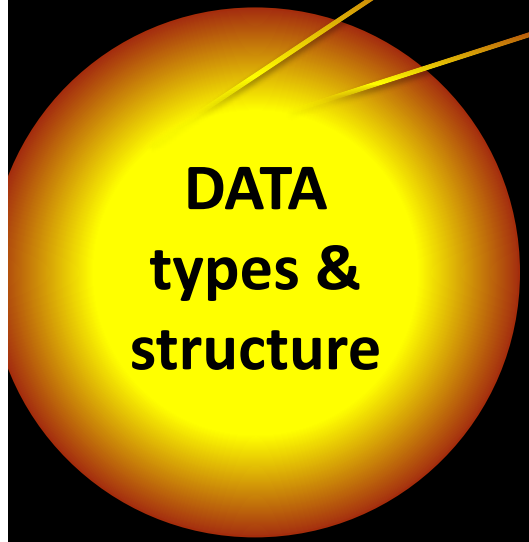

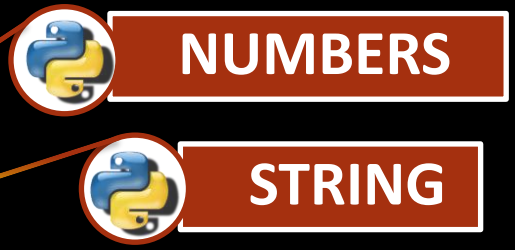

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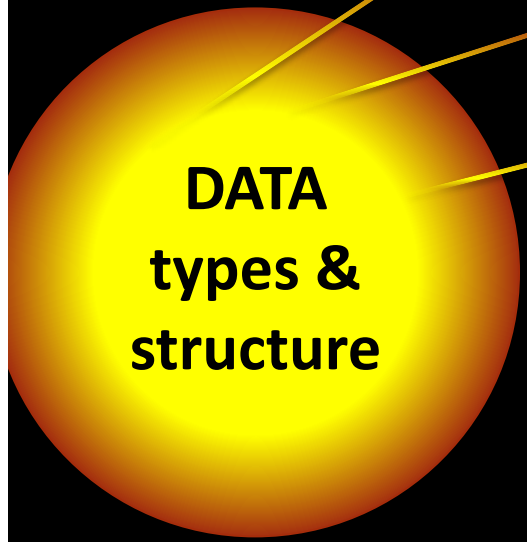

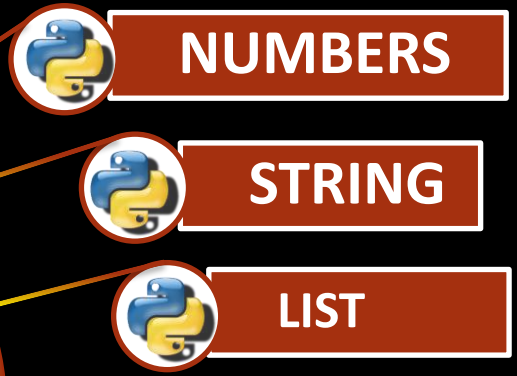

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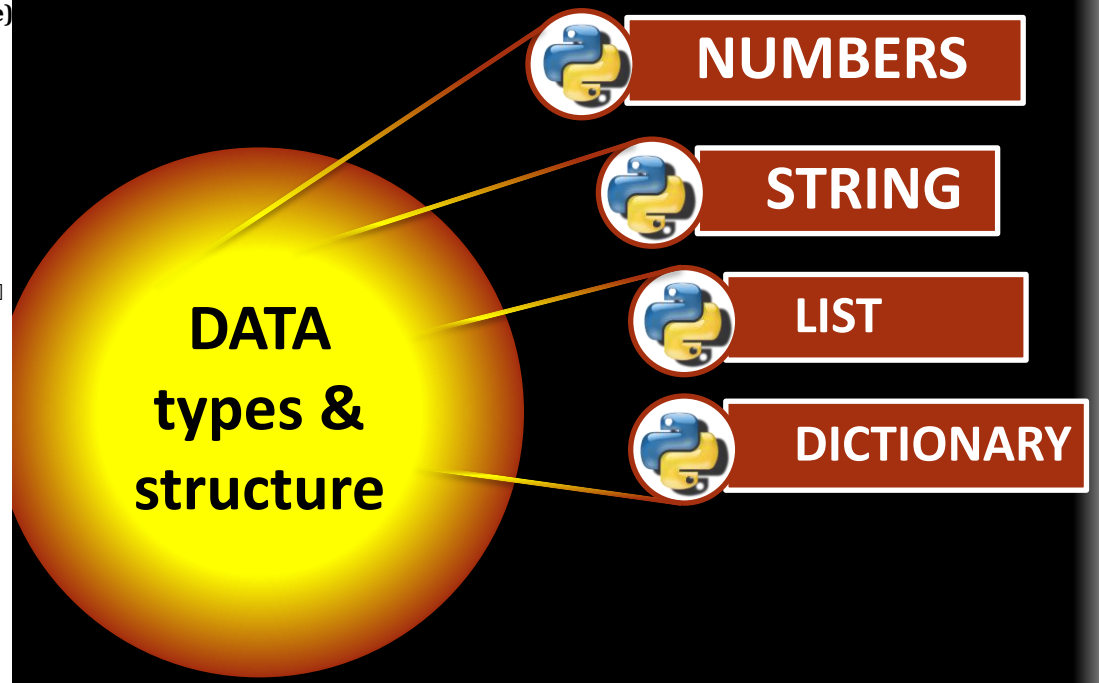

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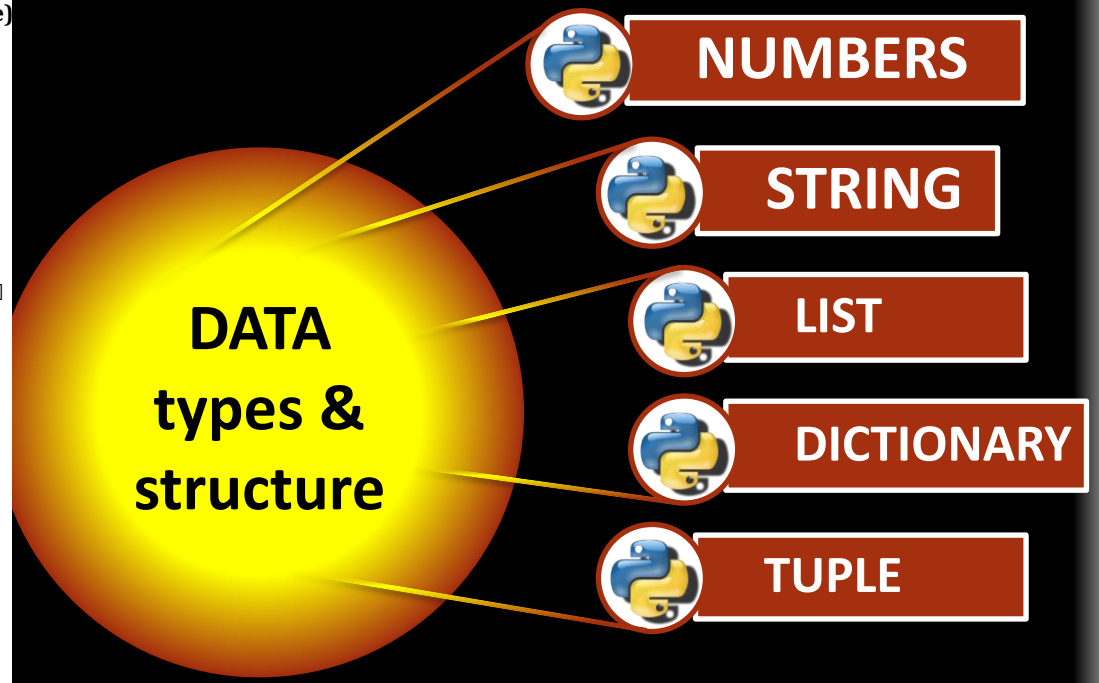

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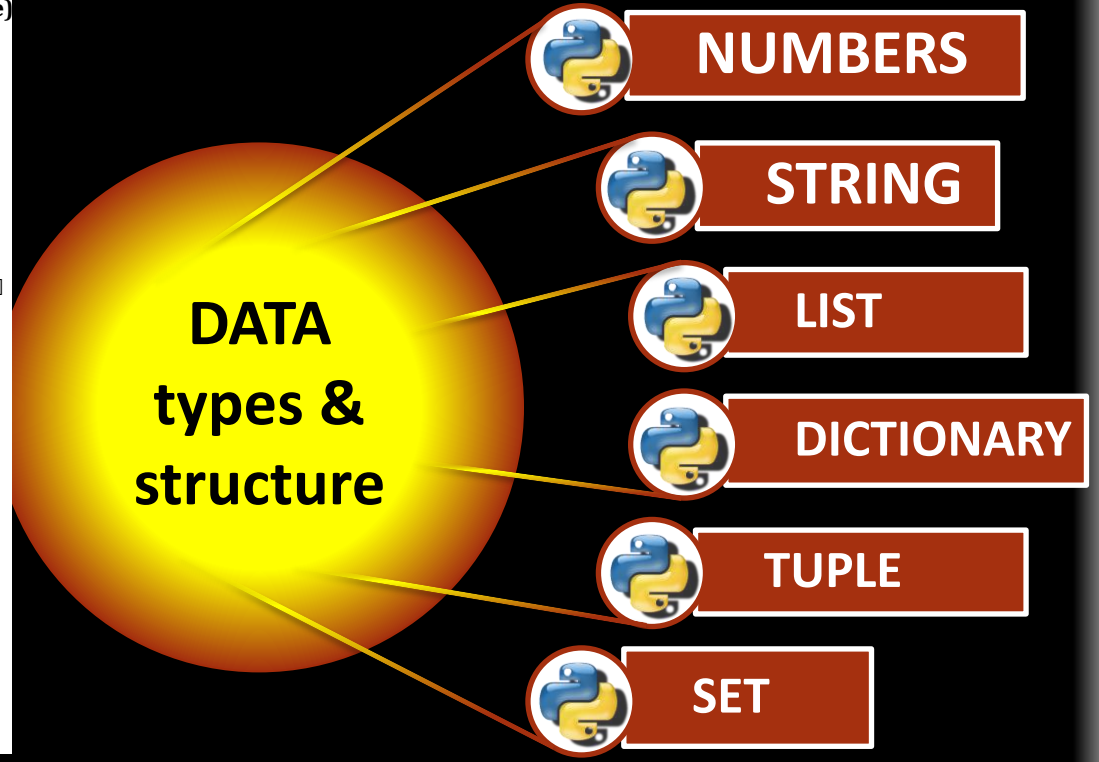

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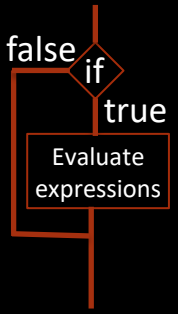

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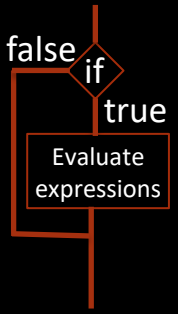
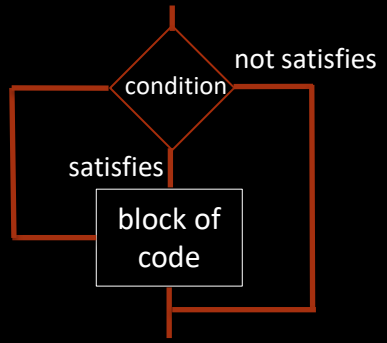


Loops: sequentially evaluation of **block of code** *multiple times*



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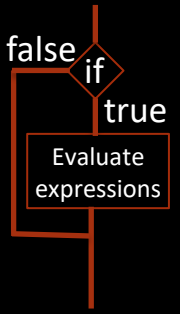

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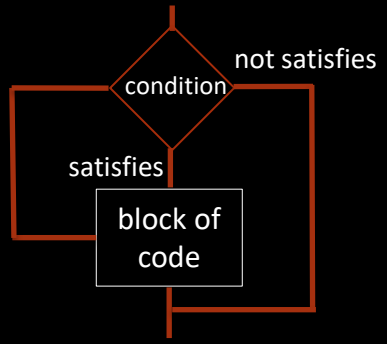

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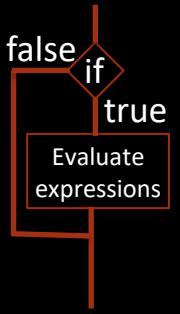

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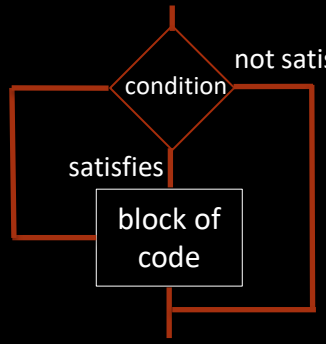

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- Methods and Functions
- Reading and Writing files
- Modules and import
- Object Oriented Programming

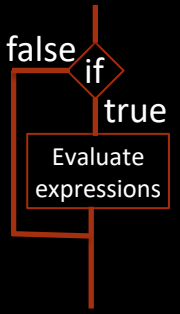
Data types

- Numbers
- List
- Tuple
- String
- Dictionary
- Set

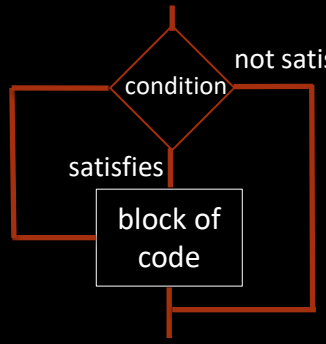
Program Flow Control in Python

- *If* Statement
- Elif Statement
- More on if, elif and else
- *For* loop
- *While* loop
- Useful operators

Decision making



Loops: sequentially evaluation of **block of code** *multiple times*



Control statements: ***break***, **continue**, **pass**

operators

Arithmetic operators (+, - , * , / , % , ...)
Assignment operators (=, +=, -=,*=,.....)
Comparison operators (==, !=, >, <,.....)
Logical operators (and, or, not),.....

Methods and Functions

Methods and Functions

- Defining a function
- Flow when calling a function
- Parameters and arguments
- Global/local
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Reading/Writing Files

Files and directories in Python

- Reading from a file
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- Printing data to external file

Modules and Import

Standard Python library

Datetime module
Math and Random module
Generators and decorators
NumPy, Pandas, Matplotlib
(basic uses)

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Two types:

Built-in functions e.g., print ()

user-defined functions

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While working with computers, users interact with computer by giving some inputs and obtaining results.

In this course, we will cover how to read data from files, and write to files

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In this course, we will cover how to read data from files, and write to files

Moreover, we will work with data formatted in CSV (comma-separated values) or JSON (JavaScript object notation),

two common formats that modules in Python's standard library handles.

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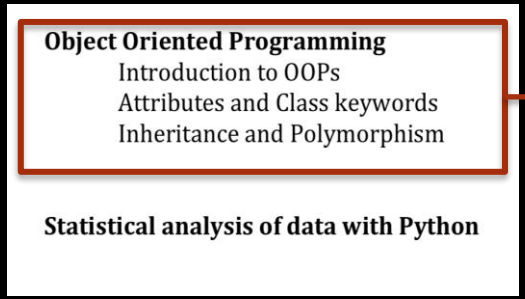
- *Python comes with a large number of modules* and has several advantages, which will be discussed in dedicated lecture on modules
- Apart from Python standard library, a large number of modules available on Python package index (https://pypi.org), can be accessed using *import*

Object Oriented Programming



This is a bit advanced topic. In the framework of this course, We will learn the basic concepts following the simple implementation

Python scope and setup

There are several editors/IDS (Integrated Development Environment)-

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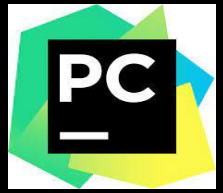
editor with light weight environment

Visual studio

Sublime Text

ATOM

PyCharm



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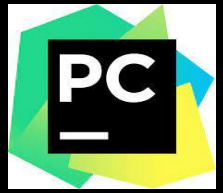

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Google Colab

Google colab /Jupyter is a web application that lets you run:

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- ✓ Embedded visualizations,
- ✓ Explanatory texts
- ✓ much more functionality

all in one place.

https://colab.research.google.com/

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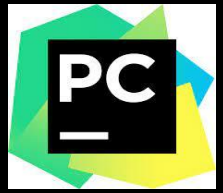

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IP[y]: Ipython Interactive Computing

https://ipython.org

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IPython

- IPython, an *interactive shell* for Python (for quick computation and testing)
- Provides rich toolkit for interactive computing.
- Allow shell syntax, tab completion, and *magic commands*
- To use IPython use ‘ pip install IPython ’ (in terminal or command prompt)

Comparison between Google Colab and IPython

Environment : Colab is cloud-based while IPython is local

Setup/install : Colab requires no installation, Ipython needs pip

GPU support : Colab has GPT/TPU (limited access), IPython doesn't.

File Handling : Colab integrates with Google drive; Ipython uses local files

Collaboration : Colab supports real-time collaboration; IPython doesn't

Media support: Colab supports inline media better than Ipython

Magic commands: IPython supports magic commands, Google Colab doesn't

Tutorials / Hands-On sessions

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