Python Basic

Introduction

Python is described as a high-level, interpreted, dynamically typed programming language.

- It was created by Guido van Rossum and first released in 1991.

Python's syntax is designed to be readable and concise, emphasizing code readability and simplicity.

Python in Data Science

Python has grown to be one of the most widely used programming languages in the data science industry because of its adaptability, large library, and simplicity of use. It provides a wide range of data-related tasks with a great ecosystem of tools and frameworks. Here are some of the main explanations for why Python is so popular in data science:

1. **Libraries for Manipulating** Data Pandas, one of Python's potent modules, offers data structures and functions for quickly modifying and analysing massive datasets. Because Pandas supports data cleansing, transformation, filtering, and merging, it is a crucial tool in workflows for data scientists.
2. **Scientific and mathematical computing:** Libraries like SciPy and NumPy offer crucial features for mathematical and scientific computations. Multi-dimensional arrays can be used and mathematical operations performed on them using NumPy, whereas SciPy expands these capabilities with extra scientific tools and methods.
3. **Visualization:** Python provides a number of visualization libraries that aid in the creation of illuminating plots, charts, and graphs, such as Matplotlib, Seaborn, and Plotly. For data exploration, analysis, and result display, these libraries are necessary.
4. **Machine learning:** Python is a go-to language for developing predictive models and data-driven solutions since it includes a wealth of libraries and frameworks for machine learning. Scikit-learn, TensorFlow, Keras, and PyTorch are a few well-known machine learning libraries.
5. **Integration with Other Technologies:** Big data processing frameworks like Apache Spark, cloud services, databases, and other tools and technologies frequently used in data science may all be easily integrated with Python.

6. **Open Source and Free:** Python is open-source and most of its data science libraries are free to use, which makes it widely accessible and promotes adoption in a variety of industries.

Key features of Python

- **High-level Language**: Python is a high-level programming language, which implies that it offers abstractions that obscure the hardware of the computer in its low-level aspects. It is simpler to communicate ideas in a way that is readable to humans since programmers can work with more abstract concepts.

- **Python is an interpreted language,** which means that the Python interpreter at runtime executes the code line by line. Unlike languages like C++ or Java, it doesn't need a separate compilation phase.

- **Dynamically Typed:** Python is dynamically typed, indicating that variable types are determined at runtime based on the values assigned to them. Unlike statically-typed languages, you don't need to explicitly declare the type of a variable before using it.

- **Standard Library:** Python comes with an extensive standard library that includes a wide range of modules and packages. These modules provide pre-built functionalities for tasks like file I/O, networking, data manipulation, and more, enhancing code reusability and simplifying development.

- **Extensibility and Integration**: Python can be easily integrated with other languages like C, C++, and Java, enabling developers to leverage existing codebases and libraries from different languages.

Variables

A variable in Python is the name of a place in memory where data is kept. It serves as a container to store manipulable and useful values for the programme. Because Python is dynamically typed, unlike some other programming languages, you are not required to explicitly specify the data type of a variable. Using the variable's value as a starting point, the data type is deduced.

Declaring a variable

Using the create variable command, you may provide a variable a name and a value.

Variable Naming Rules:

- Variable names can only contain letters (a-z, A-Z), digits (0-9), and underscores (_).
- The first character of a variable name cannot be a numeric character
- Variable names are case-sensitive (e.g., `age`, `Age`, and `AGE` are three different variables).
- Avoid using reserved keywords as variable names (e.g., `if`, `while`, `for`, `and`, etc.).

Keywords

Keywords in Python are reserved words that have specific meanings and functionalities within the Python language. These words cannot be used as identifiers (variable names, function names, etc.) because they are already predefined and serve specific purposes in the language's syntax and semantics.

Example = True ,False, if , else, for , while etc.

Datatype in python

Datatypes in Python refer to the categorization of data based on its nature and the operations that can be performed on it. Python is a dynamically typed language, meaning the data type of a variable is determined at runtime based on the value assigned to it. Here are some common data types.

Type of datatype :

1. Integer
2. Float
3. Boolean
4. String
5. List
6. Tuple
7. Set
8. Dictionary