What is Python

Python is a general-purpose, dynamically typed, high-level, compiled and interpreted, garbage-collected, and purely object-oriented programming language that supports procedural, object-oriented, and functional programming.

- **Interpreted:**

Python is an interpreted language, which means that the Python code is executed line by line. This makes it easy to test and debug code.

- **High-Level: Python is a high-level language, which means that it abstracts away low-level details like memory management and hardware interaction. This makes it easier to write and understand code.**

- **Dynamic Typing: Python is dynamically typed, which means that you don't need to declare the data type of a variable explicitly. Python will automatically infer the data type based on the value assigned to the variable.**
- **Extensive Standard Library: Python comes with a large standard library that provides tools and modules for various tasks, such as file I/O, networking, and more. This makes it easy to build complex applications without having to write everything from scratch.**

- **Cross-Platform: Python is a cross-platform language, which means that Python code can run on different operating systems without modification. This makes it easy to develop and deploy Python applications on different platforms.**

- **Community and Ecosystem: Python has a large and active community, which contributes to its ecosystem. There are many third-party libraries and frameworks available for various purposes, making Python a versatile language for many applications.**

::::::::::::Python Used:::::::::::

- Web Development: Python is used to build web applications using frameworks like Django, Flask, and Pyramid. These frameworks provide tools and libraries for handling web requests, managing databases, and more.

- Machine Learning: Python is popular in data science and machine learning due to libraries like NumPy, pandas, Matplotlib, and scikit-learn. These libraries provide tools for data manipulation, analysis, visualization, and machine learning algorithms.

- Natural Language Processing: Python is widely used in AI and NLP applications. Libraries like TensorFlow, Keras, PyTorch, and NLTK provide tools for building and training neural networks, processing natural language, and more.

- Game Development: Python can be used for game development using libraries like Pygame and Panda3D. These libraries provide tools for creating 2D and 3D games, handling graphics, and more.

- Desktop Applications: Python can be used to build desktop applications using libraries like Tkinter, PyQt, and wxPython. These libraries provide tools for creating graphical user interfaces (GUIs), handling user input, and more.

- Web Scraping and Crawling: Python is widely used for web scraping and crawling using libraries like BeautifulSoup and Scrapy. These libraries provide tools for extracting data from websites, parsing HTML and XML, and more.

Printing 'Hello World'

- Java Code

```
public class HelloWorld {
    public static void main(String[] args) {
        System.out.println("Hello, World!");
    }
}
```

- Python Code:

```
print("Hello World)"
```

Python print() Function

- Python print() function is used to display output to the console or terminal. It allows us to display text, variables and other data in a human readable format.
- **Syntax:**
- print(object(s), sep=separator, end=end, file=file, flush=flush)

- It takes one or more arguments separated by comma(,) and adds a 'newline' at the end by default.

Comments

- Comments in Python start with the # symbol and are used to explain code or make notes. Comments are ignored by the Python interpreter.

-----Variables-----

- Variables are used to store data. In Python, you don’t need to declare the data type of a variable explicitly. Python will automatically infer the data type based on the value assigned to the variable.

```
x = 10  # Integer
y = 3.14  # Float
name = "John"  # String
```

- A variable is the name given to a memory location. A value-holding Python variable is also known as an identifier.
- Variable names must begin with a letter or an underscore, but they can be a group of both letters and digits.
- The name of the variable should be written in lowercase. Both Rahul and rahul are distinct variables.
- Identifier Naming
- The variable's first character must be an underscore or alphabet (_).
- Every one of the characters with the exception of the main person might be a letter set of lower-case(a-z), capitalized (A-Z), highlight, or digit (0-9).
- White space and special characters (!, @, #, %, etc.) are not allowed in the identifier name. ^, &, *).
- Identifier name should not be like any watchword characterized in the language.
- Names of identifiers are case-sensitive; for instance, my name, and MyName isn't something very similar.
- Examples of valid identifiers: a123, _n, n_9, etc.
- Examples of invalid identifiers: 1a, n%4, n 9, etc.

Declaring Variable and Assigning Values

- Python doesn't tie us to pronounce a variable prior to involving it in the application. It permits us to make a variable at the necessary time.
- In Python, we don't have to explicitly declare variables. The variable is declared automatically whenever a value is added to it.
- The equal (=) operator is utilized to assign worth to a variable.

Object Identity

Every object created in Python has a unique identifier. Python gives the dependable that no two items will have a similar identifier. The object identifier is identified using the built-in id() function. consider about the accompanying model.

Code--

```
a = 50
b = a
print(id(a))
print(id(b))
# Reassigned variable a
a = 500
print(id(a))
```