Introduction to Python

- **Python** is a general-purpose, dynamic, high-level, and interpreted programming language.

- **Python** supports multiple programming patterns, including object-oriented, imperative, and functional or procedural programming styles.
- It was created by **Guido van Rossum** during **1985- 1990**. Python source code is available under the GNU General Public License (GPL).
- Python has many web-based assets, open-source projects, and a vibrant community.
- Python is an open-source, cost-free programming language. It is utilized in several sectors and disciplines as a result.

❖ Python Basic Syntax

There is no use of curly braces or semicolon in Python programming language.

```
def func():
    statement 1
    statement 2
    ……….
    ……….
     statement N
```

✓ In the above example, the statements that are the same level to the right belong to the function. Generally, we can use four whitespaces to define indentation.

❖ Python Features

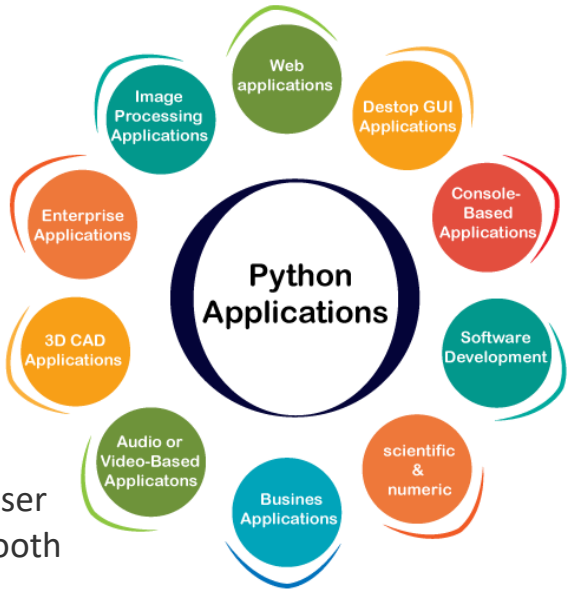
- **Readability:** Python's syntax emphasizes code readability and uses indentation to define code blocks, making it easy to write and understand code.
- **Versatility:** Python can be used for various applications, including web development, data analysis, scientific computing, artificial intelligence, automation, and more.
- **Dynamic Typing:** Python uses dynamic typing, allowing variables to change types on the fly, which enhances flexibility and reduces the need for explicit type declarations.
- **Interpreted Nature:** Python is an interpreted language, allowing you to execute code directly without needing a compilation step, making development and debugging quicker.
- **Large Standard Library:** Python comes with a comprehensive standard library that provides modules and functions for a wide range of tasks, reducing the need to reinvent the wheel.
- **Cross-Platform:** Python is cross-platform, meaning code written on one platform can be easily executed on other platforms without significant modifications.
- **Object-Oriented:** Python supports object-oriented programming, allowing you to structure code using classes and objects for better organization and reusability.
- **Extensive Third-Party Libraries:** Python has a vast ecosystem of third-party libraries and frameworks that simplify complex tasks and accelerate development.
- **Community and Support:** Python has a large and active community of developers who contribute to its growth, provide support, and create various resources for learning.

- **Open Source:** Python is an open-source language, meaning its source code is freely available to the public, promoting collaboration and enabling customization according to specific needs.

❖ Python Application

1) Web Applications

- We can use Python to develop web applications.
- It provides libraries to handle internet protocols such as HTML and XML, JSON, Email processing, request, beautifulSoup, Feedparser, etc.



2) Desktop GUI Applications

- The GUI stands for the Graphical User Interface, which provides a smooth interaction to any application.

3) Console-based Application

- Console-based applications run from the command-line or shell. These applications are computer program which are used commands to execute.
- This kind of application was more popular in the old generation of computers. Python can develop this kind of application very effectively.

4) Software Development

- Python is useful for the software development process.
- It works as a support language and can be used to build control and management, testing, etc.

5) Scientific and Numeric

- This is the era of Artificial intelligence where the machine can perform the task the same as the human.
- Python language is the most suitable language for Artificial intelligence or machine learning.
- It consists of many scientific and mathematical libraries, which makes easy to solve complex calculations.

6) Business Applications

- Business Applications differ from standard applications. E-commerce and ERP are an example of a business application.
- This kind of application requires extensively, scalability and readability, and Python provides all these features.

7) Audio or Video-based Applications

- Python is flexible to perform multiple tasks and can be used to create multimedia applications.
- Some multimedia applications which are made by using Python are **TimPlayer, cplay,** etc.

8) 3D CAD Applications

- The CAD (Computer-aided design) is used to design engineering related architecture.
- It is used to develop the 3D representation of a part of a system.
- Python can create a 3D CAD application by using the following functionalities.

9) Enterprise Applications

- Python can be used to create applications that can be used within an Enterprise or an Organization.
- Some real-time applications are OpenERP, Tryton, Picalo, etc.

10) Image Processing Application

- Python contains many libraries that are used to work with the image.
- The image can be manipulated according to our requirements.

❖ First Python Program

So before moving on further.. let's do the most popular 'HelloWorld' tradition .

```
# Python code for "Hello World"

# nothing else to type...see how simple is the syntax.

print("Topper World")
```

Output:

```
Topper World
```