



COMPUTING FUNDAMENTALS USING PYTHON

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Introduction to Python Programming

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- **Programming** is the process of creating a set of instructions that tell a computer how to perform a task.
- Programming can be done using a variety of computer programming languages, such as JavaScript, Python, and C++.

- Python is a general purpose programming language.
- Created by **Guido van Rossum**.



In December 1989, Van Rossum had been looking for a "hobby programming project that would keep him occupied during the week around Christmas" as his office was closed.

He decided to write an interpreter for a "new scripting language he had been thinking about lately: a descendant of ABC that would appeal to Unix/C hackers".

He attributes choosing the name "Python" to being in a slightly irreverent mood and being a big fan of popular show "**Monty Python's Flying Circus**".

What is Python?

- Python is a powerful high-level, object-oriented programming language.
- Python is a general-purpose language.
- It has wide range of applications from
 - Web development (like: Django and Bottle)
 - Scientific and mathematical computing (Orange, SymPy, NumPy)
 - Desktop graphical user Interfaces (Pygame, Panda3D).

Why Python?

- It is a beginner friendly language
- Easy to understand
- Easy to maintain and also
- It is portable language

Features of Python:

1. A simple language which is easier to learn

- Python has a very simple and elegant syntax.
- It is much easier to read and write Python programs compared to other languages like: C++, Java, C#.
- Python makes programming fun and allows you to focus on the solution rather than syntax.

2. Free and open-source

- Freely use and distribute Python, even for commercial use.
- Distribute software's written in it.
- Make changes to the Python's source code.
- Python has a large community constantly improving it in each iteration.

3. Portability

- Python programs can be moved from one platform to another, and run without any changes.
- It runs seamlessly on almost all platforms including Windows, Mac OS X and Linux.

4. Extensible and Embeddable

- Pieces of C/C++ or other languages can be combined with Python code.
- Scripting capabilities of other languages can be used with python.

5. It is a high-level, interpreted language

- When Python code is run, it automatically converts the code to the language the computer understands.

6. Large standard libraries to solve common tasks

- Python has a number of standard libraries which makes life of a programmer much easier since you don't have to write all the code yourself.
- Standard libraries in Python are well tested and used by hundreds of people.

7. Object-oriented

- Everything in Python is an object.
- Object oriented programming (OOP) helps to solve a complex problem intuitively.
- With OOP, the complex problems can be divided into smaller sets by creating objects.

Where we can use Python?

- **Python can be used in Data Science, Data Analysis**
- **It is used for backend web development**
- **Used in Network Monitoring**
- **Artificial Intelligence and Scientific computing**
- **Used for Game development- desktop apps, 3D graphics**
- **GUI's**
- **Python works on different platforms like Windows, Mac, Linux, Raspberry Pi etc.**

There are different versions of Python

- Version 1.0 was released in Jan 1994
- Version 2.0 was released in Oct 2000
- **Version 3.0** was released in Dec 2008 and this is the **latest version**

- Go to <https://www.python.org/downloads/>
- Download Python 3.10.10. or Python 3.10.9.
- IDE:
 - **Thonny**
 - gedit
 - sublime
 - spyder
 - Pycharm
 - Jupyter

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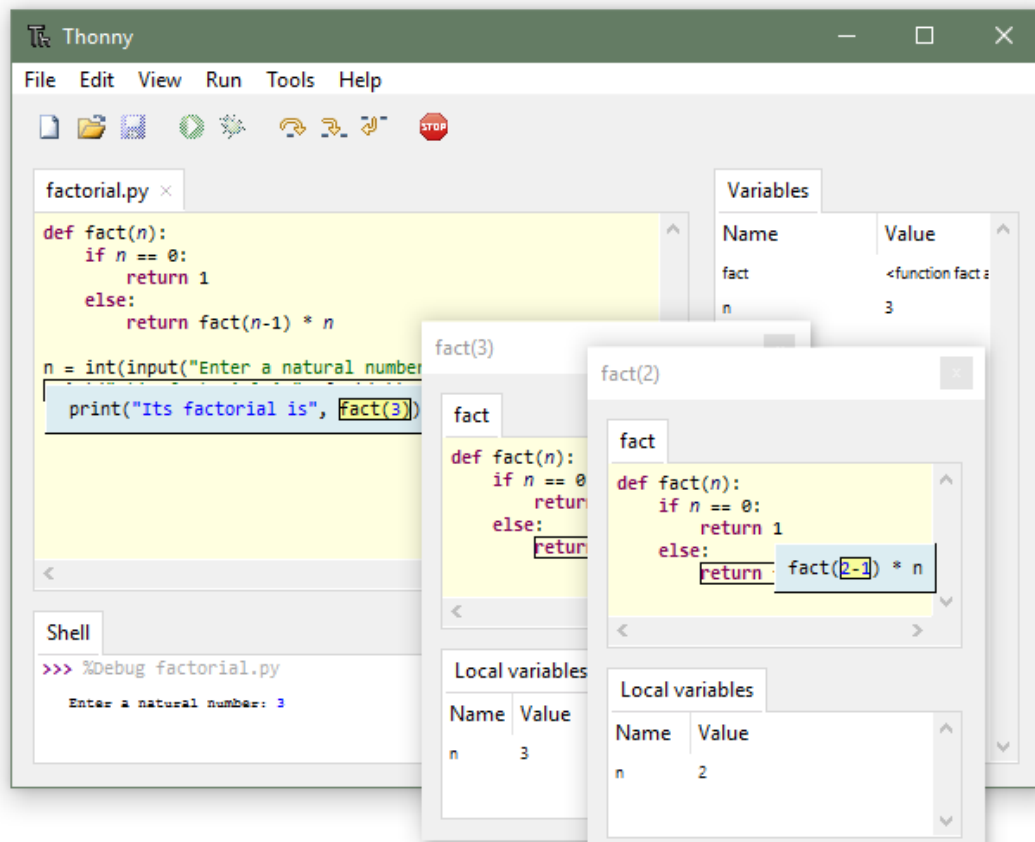
Python Installation

- Go to <https://www.thonny.org>

Thonny
Python IDE for beginners



Download version [3.3.13](#) for
[Windows](#) • [Mac](#) • [Linux](#)



1. Immediate mode

- Typing python in the command line will invoke the interpreter in immediate mode.
- Directly type in Python expressions and press enter to get the output.

>>>

- is the **Python prompt**.
- It tells us that the interpreter is ready for our input.
- To exit this mode **type exit() or quit()** and **press enter**.

2. Script mode

- This mode is used to execute Python program written in a file. Such a file is called a **script**.
- Scripts can be saved to disk for future use.
- Python scripts have the extension **.py**
- To execute the file in script mode simply write python **<filename>.py** at the command prompt.

- **Integrated Development Environment (IDE)**
 - Use any text editing software to write a Python script file.
 - Save it with the .py extension.
 - Run the file using the run button.

- IDLE is a graphical user interface (GUI) that can be installed along with the Python programming language and is available from the official website.



THANK YOU

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