# Python Tutorial: Learn Python Programming

## Python Tutorial

Today, Python is one of the most popular programming languages. Although it is a general-purpose language, it is used in various areas of applications such as Machine Learning, Artificial Intelligence, web development, IoT, and more.

This Python tutorial has been written for the beginners to help them understand the basic to advanced concepts of Python Programming Language. After completing this tutorial, you will find yourself at a great level of expertise in Python, from where you can take yourself to the next levels to become a world class Software Engineer.

*This Python tutorial is based on the latest Python 3.13 version.*

## What is Python?

**Python** is a very popular general-purpose interpreted, interactive, object-oriented, and high-level programming language. Python is dynamically-typed and garbage-collected programming language. It was created by Guido van Rossum during 1985- 1990. Like Perl, Python source code is also available under the GNU General Public License (GPL).

*Python supports multiple programming paradigms, including Procedural, Object Oriented and Functional programming language. Python design philosophy emphasizes code readability with the use of significant indentation.*

This Python tutorial gives a complete understanding of Python programming language, starting from basic concepts to advanced concepts. This tutorial will take you through simple and practical approaches while learning Python Programming language.

Learn **Python** in-depth with real-world projects through our **Python certification course**. Enroll and become a certified expert to boost your career.

## Python "Hello, World!"

To start with Python programming, the very basic program is to print "Hello, World!" You can use the print() function. Below is an example of Python code to print "Hello, World!" −

```
</>                                                    Open Compiler

# Python code to print "Hello, World!"
print ("Hello, World!")
```

# Python Online Compiler

Our Python programming tutorial provides various examples to explain different concepts. We have provided Online Python Compiler/Interpreter. You can Edit and Execute almost all the examples directly from your browser without the need to set up your development environment.

Try to click the icon ⚙ to run the following Python code to print conventional "Hello, World!".

> *Below code box allows you to change the value of the code. Try to change the value inside **print()** and run it again to verify the result.*

```
</>                                                    Open Compiler

# This is my first Python program.
# This will print 'Hello, World!' as the output

print ("Hello, World!");
```

# Characteristics of Python

Following are important characteristics of **Python Programming** −

- It supports functional and structured programming methods as well as OOP.
- It can be used as a scripting language or can be compiled to byte-code for building large applications.
- It provides very high-level dynamic data types and supports dynamic type checking.
- It supports automatic garbage collection.
- It can be easily integrated with C, C++, COM, ActiveX, CORBA, and Java.

## Applications of Python

Python is a general purpose programming language known for its readability. It is widely applied in various fields.

- In **Data Science**, Python libraries like **Numpy**, **Pandas**, and **Matplotlib** are used for data analysis and visualization.

- Python frameworks like **Django**, and **Pyramid**, make the development and deployment of Web Applications easy.

- This programming language also extends its applications to **computer vision** and image processing.

- It is also favored in many tasks like **Automation**, Job Scheduling, GUI development, etc.

## Features of Python

The latest release of Python is 3.x. As mentioned before, Python is one of the most widely used languages on the web. I'm going to list a few of them here:

- **Easy-to-learn** – Python has few keywords, simple structure, and a clearly defined syntax. This allows the student to pick up the language quickly.

- **Easy-to-read** – Python code is more clearly defined and visible to the eyes.

- **Easy-to-maintain** – Python's source code is fairly easy-to-maintain.

- **A broad standard library** – Python's bulk of the library is very portable and cross-platform compatible on UNIX, Windows, and Macintosh.

- **Interactive Mode** – Python has support for an interactive mode that allows interactive testing and debugging of snippets of code.

- **Portable** – Python can run on a wide variety of hardware platforms and has the same interface on all platforms.

- **Extendable** – You can add low-level modules to the Python interpreter. These modules enable programmers to add to or customize their tools to be more efficient.

- **Databases** – Python provides interfaces to all major commercial databases.

- **GUI Programming** – Python supports GUI applications that can be created and ported to many system calls, libraries, and Windows systems, such as Windows MFC, Macintosh, and the X Window system of Unix.

- **Scalable** – Python provides a better structure and support for large programs than shell scripting.

# Python Database Handling

The following tutorials will help you learn how to work with different databases using Python programming:

- Python MongoDB Tutorial
- Python MySQL Tutorial
- Python PostgreSQL Tutorial
- Python SQLite Tutorial

# Python Reference

The complete function and method references −

- Python Complete Reference
- Python Built-in Functions Reference
- Python Modules Reference
- Python Keywords Reference
- Python Cheatsheet

# Python Practice

Practice Python from the below-given links:

- Python Quick Guide
- Python Online Quiz
- Python Interview Questions & Answers

# Python Exercises

You can practice various Python topics with the help of examples provided:

- String Exercises
- List Exercises
- Tuple Exercises
- Set Exercises

- Dictionary Exercises
- Array Exercises

# Python Jobs

Today, Python is very high in demand, and all the major companies are looking for great Python programmers to develop websites, software components, and applications or to work with data science, AI, and ML technologies. When we are developing this tutorial in 2022, there is a high shortage of Python programmers, where the market demands a greater number of Python programmers due to its applications in machine learning, artificial intelligence, etc.

Today, a Python programmer with 3-5 years of experience is asking for around $150,000 in an in an annual package, and this is the most demanding programming language in America. Though it can vary depending on the location of the job. It's impossible to list all of the companies using Python, to name a few big companies are:

- Google
- Intel
- NASA
- PayPal
- Facebook
- IBM
- Amazon
- Netflix
- Pinterest
- Uber
- Many more...

So, you could be the next potential employee for any of these major companies. We have developed great learning material for you to learn Python programming, which will help you prepare for the technical interviews and certification exams based on Python. So, start learning Python using this simple and effective tutorial from anywhere and anytime, absolutely at your pace.

## Why to Learn Python?

Python is consistently rated as one of the world's most popular programming languages. Python is fairly easy to learn, so if you are starting to learn any programming language, then Python could be your great choice. Today, various schools, colleges, and universities

are teaching Python as their primary programming language. There are many other good reasons that make Python the top choice of any programmer:

- Python is open source, which means it's available free of cost.

- Python is simple and so easy to learn.

- Python is versatile and can be used to create many different things.

- Python has powerful development libraries, including AI, ML, etc.

- Python is much in demand and ensures a high salary.

**Python** is a MUST for students and working professionals to become great software engineers, especially when they are working in the web development domain. I will list down some of the key advantages of learning Python:

- **Python is Interpreted** – Python is processed at runtime by the interpreter. You do not need to compile your program before executing it. This is similar to PERL and PHP.

- **Python is Interactive** – You can actually sit at a Python prompt and interact with the interpreter directly to write your programs.

- **Python is Object-Oriented** – Python supports Object-Oriented style or technique of programming that encapsulates code within objects.

- **Python is a Beginner's Language** – Python is a great language for the beginner-level programmers and supports the development of a wide range of applications from simple text processing to WWW browsers to games.

## Careers with Python

If you know Python nicely, then you have a great career ahead. Here are just a few of the career options where Python is a key skill:

- Game developer

- Web designer

- Python developer

- Full-stack developer

- Machine learning engineer

- Data scientist

- Data analyst

- Data engineer

- DevOps engineer
- Software engineer
- Many more other roles

## Download Python

You can download Python from its official website: https://www.python.org/downloads/

## Python Updates & New Features

The current stable version of Python is 3.13, which was released on October 7, 2024. Python 3.14 is still in the development phase with many new features and changes:

- **PEP 649**: Deferred evaluation of annotations.
- **PEP 741**: Python configuration C API.
- **PEP 761**: Sigstore replaces PGP signatures for verification.
- Improved error messages.

## Target Audience: Who Can Learn Python?

This tutorial has been prepared for the beginners to help them understand the basics to advanced concepts of Python programming language. After completing this tutorial, you will find yourself at a great level of expertise in Python programming, from where you can take yourself to the next levels.

## Prerequisites to Learn Python

Although it is a beginners tutorial, we assume that the readers have a reasonable exposure to any programming environment and knowledge of basic concepts such as variables, commands, syntax, etc.

## Python Questions & Answers

You can explore a set of Python Questions and Answers at **Python Questions & Answers**