

## What is python Language ?

Python is a high-level,interpreted programming language that is widely used for various purposes such as web development,scientific computing,data analysis, artificial intelligence,and more.It is known for its simplicity, readability,and ease of use,making it a popular choice among beginners and experienced programmers alike.Python's syntax is designed to be intuitive and easy to understand,with a focus on readability and simplicity.

## Why it is the mostly used language in todays world ?

Python is widely used in today's world due to its versatility, simplicity, and ease of use. Here are some reasons why it is the most used language in today's world:

- **Easy to Learn:**Python has a simple syntax and is relatively easy to learn, making it.
- **Versatile:**Python can be used for a wide range of applications, including web development,scientific computing, data analysis, artificial intelligence,and more.
- **Large Community:**Python has a large and active community,with many libraries and frameworks available for various tasks.
- **Cross-Platform:**Python can run on multiple platforms,including Windows,macOS,and Linux.
- **Extensive Libraries:**Python has a vast collection of libraries and frameworks that make it easy to perform various tasks,such as data analysis,web development, and more.
- **Open-Source:**Python is an open-source language,which means that it is free to use and distribute.
- **Fast Development:**Python's syntax and nature make it ideal for rapid prototyping and development,which is why it is widely used in data science and machine learning.
- **Job Opportunities:**Python is a highly sought-after skill in the job market,with many companies using Python for various applications.
- **Easy to Integrate:**Python can easily integrate with other languages and tools,making it a great choice for building complex systems.
- **Constantly Evolving:**Python is constantly evolving,with new features and libraries being added regularly.
- **Extensive Documentation:**Python has extensive documentation,making it easy to learn and use.
- **Large Ecosystem:**Python has a large ecosystem of tools,libraries,and frameworks that mak it easy to perform various tasks.
- **Easy to Debug:**Python's syntax and nature make it easy to debug and test code,which is why it is widely used in data science and machine learning.
- **High-Level Language:**Python is a high-level language,which means that it abstracts away many low-level details, making it easier to focus on the logic of the program.
- **Dynamic Typing:**Python is dynamically typed,which means that the data type of a variable is determined at runtime,rather than at compile time.
- **Garbage Collection:**Python has automatic garbage collection,which means that memory management is handled automatically,making it easier to write code without worrying about memory leaks.
- **Extensive Support:**Python has extensive support for various operating systems,including Windows, macOS, Linux.

## History of Python ?

Python was created in the late 1980s by Guido van Rossum, a Dutch computer programmer. He began working on Python in December 1989 and released the first version, Python 0.9.1, in February 1991. The language was named after the British comedy group Monty Python's Flying Circus, which van Rossum was a fan of. The first version of Python was designed to be a scripting language, and it quickly gained popularity due to its simplicity and ease of use. Over the years, Python has evolved to become a full-fledged programming language with a wide range of applications, including web development, scientific computing, data analysis, artificial intelligence, and more. Today, Python is one of the most popular programming languages in the world, with a large and active community, and is widely used in various industries, including data science, machine learning, web development, and more.

## What is the IDE in doing programming in python?

Python has several Integrated Development Environments (IDEs) that can be used for programming. Some of the most popular IDEs for Python include:

- **PyCharm:** PyCharm is a popular IDE for Python that offers a wide range of features, including code completion, debugging, and project exploration.
- **Visual Studio Code:** Visual Studio Code is a lightweight, open-source code editor that supports Python development, with features such as code completion, debugging, and project exploration.
- **Spyder:** Spyder is an open-source IDE for Python that offers a wide range of features, including code completion, debugging, and project exploration.
- **IDLE:** IDLE is a basic IDE that comes bundled with Python, offering features such as code completion, debugging, and project exploration.
- **Thonny:** Thonny is a free and open-source IDE for Python that offers a wide range of features, including code completion, debugging, and project exploration.
- **Pylance:** Pylance is a Python extension for Visual Studio Code that offers a wide range of features, including code completion, debugging, and project exploration.
- **Jupyter Notebook:** Jupyter Notebook is a web-based interactive computing environment that supports Python development, with features such as code completion, debugging, and project exploration.
- **PyScripter:** PyScripter is a free and open-source IDE for Python that offers a wide range of features, including code completion, debugging, and project exploration.

## What is the VS Code and what are the extensions used for doing coding in VS Code ?

### What is VS Code?

**Visual Studio Code (VS Code)** is a free, **open-source code editor** developed by **Microsoft**. It's lightweight, cross-platform (works on Windows, macOS, Linux), and supports **hundreds of programming languages** with features like:

- Built-in **Git integration** (version control).
- **IntelliSense** (smart code completion).
- **Debugging tools**.
- **Terminal integration** (run commands without leaving the editor).
- **Extensions** to customize workflows.

VS Code is **not a full IDE** (like PyCharm or Eclipse) but is highly customizable and preferred for its speed and flexibility.

## Top Extensions for Coding in VS Code

Extensions enhance VS Code's functionality. Here are the **most popular ones**, categorized by purpose:

### 1. Core Programming & Language Support

- **Python** (by Microsoft):
  - Syntax highlighting, debugging, IntelliSense, Jupyter Notebook support.
- **JavaScript/TypeScript**:
  - Built-in by default; add **ESLint** for code linting.
- **Java** (Extension Pack for Java):
  - Debugging, Maven/Gradle support, and project management.
- **C/C++** (by Microsoft):
  - Code navigation, debugging, and IntelliSense.
- **Go** (Go Team at Google):
  - Autocomplete, debugging, and Go modules support.

### 2. Productivity & Workflow

- **Live Server**:
  - Launch a local development server with live reload for HTML/CSS/JS.
- **Prettier**:
  - Automatically format code (supports JS, Python, JSON, etc.).
- **GitLens**:
  - Supercharge Git: view code authorship, blame annotations, and commit history.
- **Code Runner**:
  - Run code snippets in 40+ languages (Python, C++, Java) directly from VS Code.
- **Todo Tree**:
  - Highlight and manage **TODO** comments in your codebase.

### 3. Collaboration & Remote Work

- **Remote - SSH**:
  - Connect to remote servers via SSH and edit code directly.
- **Remote - Containers**:
  - Develop inside Docker containers.
- **Live Share**:
  - Collaborate in real-time (pair programming, shared debugging).

### 4. Web Development

- **Auto Close Tag**:
  - Automatically close HTML/XML tags.
- **CSS Peek**:
  - Jump to CSS definitions from HTML.

- **Thunder Client:**
  - Lightweight REST API client (alternative to Postman).

## 5. Data Science & AI

- **Jupyter:**
  - Run Jupyter Notebooks inside VS Code.
- **Pylance:**
  - Enhanced Python IntelliSense and type-checking.
- **SQLTools:**
  - Database client for PostgreSQL, MySQL, SQLite, etc.

## 6. Themes & Customization

- **Material Icon Theme:**
  - Modern file/folder icons.
- **One Monokai Theme:**
  - Popular color scheme for readability.
- **Rainbow Brackets:**
  - Colorize brackets to improve code clarity.

## 7. AI-Powered Tools

- **GitHub Copilot:**
  - AI pair programmer that suggests code completions.
- **Tabnine:**
  - AI autocomplete for faster coding.

## How to Install Extensions

1. Open VS Code.
2. Click the **Extensions icon** (or press **Ctrl+Shift+X**).
3. Search for an extension (e.g., "Python").
4. Click **Install**.

## Why Developers Love VS Code

- **Lightweight:** Faster than traditional IDEs.
- **Customizable:** Tailor the editor with themes, keybindings, and extensions.
- **Integrated Terminal:** Run commands without switching apps.
- **Cross-Platform:** Works seamlessly on any OS.

## Sample Setup for Python Development

1. Install the **Python** extension.
2. Add **Pylance** for better type hints.
3. Use **Jupyter** for notebooks.
4. Enable **Prettier** for code formatting.
5. Add **GitLens** for Git integration.

## What are the different tpye of file we work with in the vs code ?

- **.py** (Python files)
- **.json** (JSON files)
- **.yaml** (YAML files)
- **.env** (Environment files)
- **.txt** (Text files)
- **.md** (Markdown files)
- **.html** (HTML files)
- **.css** (CSS files)
- **.js** (JavaScript files)
- **.java** (Java files)
- **.cpp** (C++ files)
- **.c** (C files)
- **.go** (Go files)
- **.ts** (TypeScript files)
- **.sql** (SQL files)
- **.xml** (XML files)
- **.json5** (JSON5 files)
- **.yml** (YAML files)
- **.docx** (word file)
- **.pdf** (pdf file)
- **.csv** (csv file)
- **.xlsx** (excel file)
- **.pptx** (ppt file)
- **.R** (R files)

## What are the different types of extensions we can install in the vs code ?

### How to install extensions in vs code ?

1. Open the Extensions view by clicking the Extensions icon in the Activity Bar on the left side of VS Code, or by pressing **Ctrl+Shift+X** (Windows/Linux) or **Cmd+Shift+X** (macOS). The Extensions view will show you a list of installed extensions. You can also search for extensions using the search box at the top of the view.
2. Click the Install button to the right of the extension you want to install. VS Code will download and install the extension. You may be prompted to reload VS Code after the installation is complete.
3. Once the extension is installed, you can enable or disable it by clicking the toggle button to the right of the extension name in the Extensions view.
4. You can also manage extensions by clicking the Manage Extensions button in the Extensions view.
5. You can also install extensions from the command line using the following command: **code --install extension <extension-id>**.

### How to uninstall extensions in vs code ?

1. Open the Extensions view by clicking the Extensions icon in the Activity Bar on the left side of VS Code, or by pressing **Ctrl+Shift+X** (Windows/Linux) or **Cmd+Shift+X** (macOS).

2. Find the extension you want to uninstall and click the toggle to the right of the extension name to disable it.
3. Click the Uninstall button to the right of the extension name to uninstall it.
4. Confirm that you want to uninstall the extension by clicking the Uninstall button in the confirmation dialog
5. Once the extension is uninstalled, you can reload VS Code to remove the extension from the Extensions view.

## Writing a file line of code in Python.

```
x= "Hello!, My name is Khawar Zaman."  
print(x)
```

This is a simple Python program that prints "hello world" to the console.