Chapter - 0: Introduction and Installation

Introduction to Python:

- High-Level Language:
  - Python is a high-level programming language, meaning it abstracts many complex details from the programmer.
  - Focuses on readability and simplicity, reducing the cost of program maintenance and development.

- Interpreted Language:
  - Python is an interpreted language, meaning the code is executed line by line at runtime.
  - This offers flexibility and ease of debugging but may sacrifice some performance compared to compiled languages.

- General-Purpose:
  - Python is a general-purpose language suitable for various applications, from web development to scientific computing and artificial intelligence.

Installation:

- **Downloading Python:**
  - Visit the official Python website at python.org.
  - Download the latest version of Python for your operating system (Windows, macOS, or Linux).

- **Running the Installer:**
  - Execute the downloaded installer.
  - Ensure the checkbox for "Add Python to PATH" is selected during installation. This simplifies running Python from the command line.

- **Verifying Installation:**
  - Open a command prompt or terminal.
  - Type **python --version** or **python -V** and press Enter.
  - The installed Python version should be displayed, confirming a successful installation.

- **Interactive Mode:**
  - Python comes with an interactive mode, allowing you to execute Python commands directly in the terminal by typing **python** and pressing Enter.

Using Python:

- **Script Execution:**
  - Write Python code in a text file with a .py extension.

- Execute scripts using the command **python script_name.py** in the terminal or command prompt.

- **Integrated Development Environments (IDEs):**
  - Enhance development with features like code completion, debugging, and project management.
  - Popular Python IDEs include PyCharm, VSCode, and Jupyter Notebooks.

Our First Python Program:

```python
# hello_world.py
print("Hello, World!")
```

- This simple script prints "Hello, World!" to the console.
- Run the script using **python hello_world.py** to verify your Python installation.

Conclusion:

- Python's simplicity, versatility, and strong community support make it an excellent choice for beginners and experienced developers alike.

- Installation is straightforward, and Python's readability encourages good coding practices.