**Que 1 : Introduction to Python and its Features (simple, high-level, interpreted language).**

**Introduction to Python**

Python is a popular, easy-to-learn programming language used for web development, data science, automation, artificial intelligence, and more. It was created by Guido van Rossum and released in 1991.

**Features of Python:**

1. **Simple and Easy to Learn:**
   * Python uses English-like syntax.
   * Easy to read and write code.
2. **High-Level Language:**
   * You don’t need to manage memory or system-level operations.
   * Focus on solving problems, not low-level details.
3. **Interpreted Language:**
   * Python runs code line by line.
   * No need to compile before running.
4. **Free and Open Source:**
   * Python is free to use.
   * Source code is available to everyone.
5. **Portable:**
   * Write code once and run it anywhere (Windows, Mac, Linux).
6. **Object-Oriented and Functional:**
   * Supports both object-oriented and functional programming styles.
7. **Large Standard Library:**
   * Comes with many built-in modules and functions (e.g., math, datetime, os).
8. **Dynamically Typed:**
   * No need to declare variable types.
   * Python detects the type at runtime.
9. **Extensible and Embeddable:**
   * You can write some parts in C/C++ and use them in Python.
   * You can also embed Python code in other languages.
10. **Wide Community Support:**

* Huge number of libraries and frameworks.
* Active community for help and resources.

**Que 2 : History and evolution of Python.**

**Origin and Creator:**

* Python was created by Guido van Rossum in the late 1980s.
* He started developing it during Christmas 1989 at the Centrum Wiskunde & Informatica (CWI) in the Netherlands.
* The name "Python" was inspired by the British comedy group "Monty Python’s Flying Circus", not the snake.

**Evolution :**

|  |  |  |
| --- | --- | --- |
| **Year** | **Version/Update** | **Highlights** |
| **1991** | **Python 0.9.0 (First Release)** | Introduced core features: functions, exceptions, modules |
| **1994** | **Python 1.0** | Added tools like lambda, map, filter, and reduce |
| **2000** | **Python 2.0** | Introduced list comprehensions and garbage collection |
| **2008** | **Python 3.0 (Major Upgrade)** | Not backward-compatible, better Unicode support, new syntax |
| **2010s** | **Python 3.x series** | Continued improvements: f-strings, async/await, type hints |
| **2020** | **Python 2 officially ended** | No more updates or support for Python 2 |
| **2023** | **Python 3.10 – 3.12** | Match-case (like switch), better error messages, performance improvements |

**Que 3: Advantages of using Python over other programming languages.**

**Advantages :**

**1. Easy to Learn and Use**

* Python has a simple, readable syntax like English.
* Great for beginners and professionals alike.

**2. Free and Open Source**

* Python is completely free to download and use.
* Open source – its code can be modified and shared.

**3. Cross-Platform**

* Works on Windows, Mac, and Linux without changing the code.

**4. Large Standard Library**

* Comes with many built-in modules for tasks like file handling, web development, math, etc.

**5. Wide Range of Applications**

* Used in:
  + Web Development (Django, Flask)
  + Data Science (Pandas, NumPy)
  + AI and Machine Learning (TensorFlow, scikit-learn)
  + Automation/Scripting
  + Game Development

**6. Strong Community Support**

* Huge community with forums, tutorials, and third-party libraries.
* Easier to get help and resources.

**7. Integration Friendly**

* Easily integrates with languages like C, C++, Java.
* Can work with databases and web services.

**8. Fewer Lines of Code**

* Tasks that need many lines in C++ or Java can often be done in fewer lines in Python.

**9. Dynamically Typed**

* No need to declare variable types.
* Faster to write and change code.

**10. Good for Rapid Development**

* Helps build prototypes and applications quickly.

**Que 4 : Installing Python and setting up the development environment (Anaconda, PyCharm, or VS Code).**

**Installing Python**

**Step 1: Download Python**

* Go to: [https://www.python.org](https://www.python.org/)
* Click **Downloads** → Choose your OS (Windows/Mac/Linux)

**Step 2: Install Python**

* Run the downloaded installer
* **Important:** Check the box “**Add Python to PATH**”
* Click **Install Now**

**Step 3: Verify Installation**

* Open terminal or command prompt
* Type : python —version

**Setting Environment using VS Code :**

**How to Install:**

* Go to: <https://code.visualstudio.com/>
* Install for your OS

**Set Up for Python:**

1. Open VS Code
2. Go to Extensions (left sidebar) → Search **Python** → Install
3. Install Python separately if not already installed
4. Create .py files and run using the terminal

**Que 5 : Writing and executing your first Python program.**

**Writing:**

**Print(“Hello World”)**

**Executing**

**Method 1: Using Right Click**

* Right-click anywhere in the code → Click **“Run Python File in Terminal”**

**Method 2: Using Play Button**

* Click the green ▶️ **“Run”** button in the top-right corner