**PYTHON INTRODUCTION NOTES**

**Python Notes (Simplified)**

**1. Introduction to Software**

* **Software → A collection of applications/programs.**
* **Program → A collection of instructions.**

**Types of Software:**

1. **System Software**
   * **Examples: Operating System (OS), Compiler, Loader, Linker, etc.**
   * **Python is generally not used for system software (C, C++, VC++, .NET are more common).**
2. **Application Software**
   * **Two types:**
     + **Backend (logic/coding part – e.g., Python, C, C++, Java)**
     + **Frontend (design/output part – e.g., HTML, CSS, JavaScript)**
3. **Web Software**
   * **Internet-based applications.**
   * **Examples: Websites, Web Apps.**
   * **Learn: HTML, CSS, PHP, JavaScript, Python.**
4. **Device Software**
   * **Mobile app development.**
   * **Example: Android (Java), iOS (Swift).**
   * **Python is less common but can be used with some frameworks.**
5. **AI / IoT Software**
   * **Includes Machine Learning (ML), Deep Learning (DL), Natural Language Processing (NLP), Data Science, Internet of Things (IoT).**

**2. What is Python?**

* **Python is a popular, high-level programming language.**
* **Created by Guido van Rossum and released in 1991.**

**Key Features:**

1. **Open-source and free.**
2. **Supports both procedure (step-by-step) and object-oriented programming.**
3. **Platform-independent (works on Windows, Mac, Linux, etc.).**
4. **Easy syntax (similar to English).**
5. **Interpreted language (runs directly without compilation).**

**3. Why Python?**

1. **Works on different platforms (Windows, Mac, Linux, Raspberry Pi, etc.).**
2. **Easy to read and write (syntax similar to English).**
3. **Requires fewer lines of code compared to other languages.**
4. **Interpreter-based → runs code as soon as it is written (good for rapid prototyping).**
5. **Can be used in multiple ways: procedural, object-oriented, or functional programming.**

**4. What Can Python Do?**

1. **Used on servers to create Web Applications.**
2. **Used alongside software to create workflows.**
3. **Can connect to databases (MySQL, Oracle, DB2) – read & modify files.**
4. **Handle Big Data and perform complex mathematics.**
5. **Useful for rapid prototyping and production-ready software.**

**5. Uses of Python**

* **Application Software Development**
* **Web Development**
* **Artificial Intelligence (AI)**
* **IoT (Internet of Things)**
* **Machine Learning (ML)**
* **Data Science & Data Analysis**
* **Cybersecurity**
* **Software Engineering**
* **Gaming Applications**

**6. Where Do We Use Python?**

1. **Desktop Applications (Windows apps)**
2. **Web Applications**
3. **Network Applications (e.g., Cyber Security)**
4. **Gaming Applications**
5. **Data Science**