# Recommended Python Version: Python 3.10.x

**📌 Why Python 3.10 is Best for Your FYP?**

| **Reason** | **Details** |
| --- | --- |
| ✅ **Stable & LTS** | Python 3.10 is **well-tested and stable**, with long-term support and widely adopted. |
| ✅ **Library Compatibility** | Works perfectly with **OpenCV**, **TensorFlow**, **PyTorch**, **YOLOv8**, **MediaPipe**, **SpeechRecognition**, etc. |
| ✅ **Performance** | Improved speed & memory usage compared to 3.6–3.9 |
| ✅ **New Features** | Python 3.10 introduced match-case, better error messages, and type hints that help in organizing large codebases like your FYP. |
| ✅ **Supported by Tools** | Compatible with **VS Code**, **Jupyter**, **Colab**, and all major plugins. |

**⚠️ Avoid These Versions:**

| **Version** | **Why Avoid** |
| --- | --- |
| 3.6 or older | Many modern AI libraries (YOLOv8, ultralytics, etc.) **no longer support** these. |
| 3.11, 3.12 | Very new → some **compatibility issues** with existing AI/ML tools and libraries. |
| Anaconda with old env | Can create version conflicts unless carefully managed. |

**🧠 Final Verdict:**

🔥 **Go with Python 3.10.11** – it's current, stable, and safe for your entire GuardianAI project stack.

**🧰 Where to Get It?**

* Download from official:  
  [🔗 https://www.python.org/downloads/release/python-31011/](https://www.python.org/downloads/release/python-31011/)
* Or use via:
  + Anaconda (create env: conda create -n guardianai python=3.10)
  + Virtualenv (for isolated environments)

**🛠 Libraries That Work Smoothly on Python 3.10:**

| **Library** | **Use** |
| --- | --- |
| OpenCV | Camera & image processing |
| Ultralytics (YOLOv8) | Object/person detection |
| PyTorch / TensorFlow | ML models |
| SpeechRecognition | Voice command (cry detection, alerts) |
| Pyttsx3 / gTTS | Baby alerts with voice |
| Firebase, socket | Notifications |
| Cryptography, Fernet | File encryption for InfoSec |

# Step-by-Step: Install & Setup Python 3.10.11 on VS Code (Windows)

**🔹 Step 1: Install Python 3.10.11**

1. Go to the official download page:  
   👉 <https://www.python.org/downloads/release/python-31011/>
2. Scroll down and download this:

🔸 **Windows installer (64-bit)** → Windows Installer (64-bit)

1. Run the installer:  
   ✅ **Check this option:**  
   🔲 ✅ Add Python 3.10 to PATH → **Must select!**
2. Click Install Now.

**🔹 Step 2: Verify Python Installation**

1. Open **Command Prompt (CMD)**

python --version

✔ Output should be:

Python 3.10.11

If it says "not recognized", restart your PC.

**🔹 Step 3: Install VS Code (If Not Installed)**

* Download: <https://code.visualstudio.com>
* Install normally
* Launch VS Code

**🔹 Step 4: Install Python Extension in VS Code**

1. Open VS Code
2. Go to **Extensions (Ctrl+Shift+X)**
3. Search: Python by Microsoft (the official one)
4. Click **Install**

**🔹 Step 5: Set Interpreter to Python 3.10.11**

1. Open **any .py file** (or create a new one like test.py)
2. Press Ctrl+Shift+P → Search:  
   Python: Select Interpreter
3. You will see something like:

Python 3.10.11 (C:\Users\YourName\AppData\Local\Programs\Python\Python310)

1. Select it ✅

**🔹 Step 6: Test Run a Python File**

Create a file hello.py and paste:



Now press:

* ▶️ **Run Button (top-right)**
* or **Right-click > Run Python File in Terminal**

**output:**

GuardianAI Python is Ready 🚀