# 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/

- 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)

   3. Run the installer:
     ✅ **Check this option:**
     ☐ ✅ Add Python 3.10 to PATH → **Must select!**

   4. Click Install Now.

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◆ **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.

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◆ **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**

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◆ **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)

4. Select it ✅

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◆ **Step 6: Test Run a Python File**

Create a file hello.py and paste:

print("GuardianAI Python is Ready 🚀")

Now press:

- ▶️ **Run Button (top-right)**

- or **Right-click > Run Python File in Terminal**

## output:

GuardianAI Python is Ready 🚀

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