Install Python

- Download Python:
  - Go to the official Python website.
  - Click on the "Download Python" button (the latest version will be highlighted).
- Run the Installer:
  - Locate the downloaded installer (usually a .exe file for Windows) and double-click it.
  - Important: Check the box that says "Add Python to PATH" before clicking "Install Now".
  - Follow the on-screen instructions to complete the installation.
- Verify Installation:
  - Open a command prompt (Windows) or terminal (macOS/Linux).
  - Type python --version or python3 --version and press Enter. You should see the installed Python version.

Install PyCharm

- Download PyCharm:
  - Visit the JetBrains PyCharm website.
  - Choose the Community edition (free) or Professional edition (paid) based on your needs.
  - Download the installer appropriate for your operating system.
- Run the Installer:
  - For Windows, double-click the downloaded `.exe` file. For macOS, open the `.dmg` file.
  - Follow the installation instructions. You can keep the default settings.
- Launch PyCharm:
  - After installation, open PyCharm from your applications or Start Menu.

Create a new project in Pycharm

- Start a New Project:
  - When PyCharm opens, click on "New Project".
- Configure the Project:
  - Location: Choose a directory for your project.
- Python Interpreter:
  - PyCharm should automatically detect the Python interpreter you installed. If it doesn't, click on the gear icon next to the interpreter dropdown, select "Add...", and then choose "System Interpreter".
  - Navigate to the Python executable (e.g., C:\Python39\python.exe on Windows or /usr/bin/python3 on macOS/Linux).
- Create the Project:
  - Click "Create" to set up your new project.

Set up a virtual environment (optional but recommended)

- Create a Virtual Environment:

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- In the New Project dialog, you can select "New environment using" and choose "Virtualenv".
- Ensure that the base interpreter is set to the Python version you installed.

➢ Activate the Virtual Environment:

- If you created a virtual environment, you can activate it by running the following command in the terminal:

➢ Windows:

.\venv\Scripts\activate

➢ macOS/Linux:

source venv/bin/activate

Install Packages

➢ Using PyCharm:

- Go to File > Settings (or PyCharm > Preferences on macOS).
- Navigate to Project: [your_project_name] > Python Interpreter.
- Click on the + icon to add packages.
- Search for the package you need (e.g., numpy, pandas) and click Install Package.

➢ Using Terminal:

- Open the terminal in PyCharm (bottom left).
- Use pip to install packages:

```
pip install package_name
```

Write and Run a Python Script

➢ Create a New Python File:

- Right-click on the project folder in the Project pane.
- Select New > Python File and name your file (e.g., main.py).
- Write Your Code:
- Open the newly created file and write your Python code.

➢ Run Your Script:

- Right-click anywhere in the editor and select Run 'main' or click the green play button in the top right corner.

Additional Tips

➢ Documentation**:** PyCharm has built-in documentation. You can access it by pressing Ctrl + Q (Windows/Linux) or F1 (macOS) when your cursor is on a function or class.

➢ Version Control: PyCharm supports Git integration. You can initialize a repository and manage your version control directly from the IDE.

➢ Plugins: Explore PyCharm plugins for additional functionality. Go to File > Settings > Plugins to browse and install plugins.

Install OpenCV Using pip

- **Open Command Prompt:**
  - Press `Win + R`, type `cmd`, and hit Enter to open the command prompt.
- **Upgrade pip (Optional but Recommended):**
  - Before installing OpenCV, it's a good idea to ensure that pip is up to date. Run the following command:

```
python -m pip install --upgrade pip
```

- **Install OpenCV:**
  - Use pip to install the OpenCV package by running the following command:

```
pip install opencv-python
```

  - If you need additional functionalities (like working with video files), you can also install the contrib package:

```
pip install opencv-python-headless
```

Verify OpenCV Installation

- **Open Python:**
  - Type `python` in the command prompt and press Enter to start the Python interpreter.
- **Import OpenCV:**
  - In the Python shell, type the following command:

```
import cv2
```

  - If no error occurs, OpenCV has been successfully installed.
- **Check the Version:**
  - You can check the installed version of OpenCV by running:

```
print(cv2.__version__)
```

Setting Up a Simple Project (Optional)

- **Create a New Directory:**
  - Create a new folder for your OpenCV project (e.g., `OpenCV_Project`).
- **Create a Python File:**
  - Inside your project folder, create a new Python file (e.g., `main.py`).
- **Write a Simple OpenCV Script:**
  - Open the `main.py` file in a text editor or IDE and add the following code:

```
import cv2

# Load an image
image = cv2.imread('path_to_your_image.jpg')

# Display the image in a window
cv2.imshow('Image', image)
cv2.waitKey(0)
cv2.destroyAllWindows()
```

- **Run Your Script:**
  - Make sure to replace `'path_to_your_image.jpg'` with the actual path to an image on your computer.
  - Run the script from the command prompt:

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```
python main.py
```

Additional tips

- **Use Virtual Environments:** It's a good practice to use virtual environments for your projects. You can create one using `venv`:

```
python -m venv myenv
myenv\Scripts\activate
```

  - Then install OpenCV within this environment.

- **Explore OpenCV Documentation:** Familiarize yourself with the OpenCV documentation for more information on functions and capabilities.
- **Install Additional Libraries:** Depending on your project, you might want to install other libraries like NumPy:

```
pip install numpy
```

Please watch this tutorials to help you out with python and OpenCv

https://www.youtube.com/watch?v=K5KVEU3aaeQ&t=7114s

https://www.youtube.com/watch?v=HHcZbXsZtm0&t=203s

https://www.youtube.com/watch?v=WQeoO7MI0Bs&t=33s

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