Setting up your Python Project Environment

In this document, you will have step-by-step instructions on how to set up your project environment to successfully work on the hands-on and projects in the Course.

We are going to use two IDEs (Integrated Development Environments) - **VS Code and Analconda Jupyter Notebook.**

Below, you will have instructions to set up both of them and also how to install the common libraries used in the Course.

Installing and Setting up VS Code: Step by Step

Initial Installations:

- **VS Code Installation:** Download and install VS Code from the official website if you haven't already: https://code.visualstudio.com/download
- **Python Installation:** Ensure you have Python installed on your system. You can verify this by opening a terminal and running python --version. If not installed, download it from: https://www.python.org/downloads/

Further Steps:

1. Open VS Code: Launch VS Code.

2. Create a Project Folder:
   Go to File > Open Folder (or Open Workspace for multi-folder projects) and create a new folder for your project. This will be your workspace in VS Code.

3. Create a Virtual Environment:
   Open the integrated terminal in VS Code (Terminal > New Terminal).
   For venv (built-in Python module):

```
python -m venv <environment_name>  # Replace '<environment_name>' with your desired name (e.g.,
data_science_env)

Or

conda create -n <environment_name> python=<python_version>  # Replace '<environment_name>' and
'<python_version>' accordingly
```

4. Activate the environment:

For venv:

```
source <environment_name>/bin/activate  # On macOS/Linux
```

```
<environment_name>\Scripts\activate.bat  # On Windows
Or
conda activate <environment_name>
```

You

5. Create a requirements.txt File:

   In your project folder, create a new file named requirements.txt. This file will list all the Python packages you need for your project.
   Use a package manager like pip or conda to install dependencies in the activated virtual environment:

```
pip install <package_name>  # Using pip
conda install -c conda-forge <package_name>  # Using conda (if using conda-forge)
```

Add each package you install to the requirements.txt file. This ensures reproducibility and makes it easier to share your project setup with others.

6. Create a .env File (Optional but suggested):

The .env file is useful for storing sensitive information like API keys or database credentials. Create this file in your project's root directory, but exclude it from version control (e.g., using a .gitignore file).

```
Example:

OPENAI_API_KEY=your_api_key
SERP_API_KEY=your_api_key
PINECONE_API_KEY=your_api_key
```

Access these variables in your Python code using environment variables:

```
from dotenv import load_dotenv
load_dotenv()
```

Or,

```
import os

api_key = os.environ.get('OPENAI_API_KEY')
```

Other steps:

- Install VS Code Extensions: Consider installing extensions like Python, Jupyter, and Data Science for enhanced functionality within VS Code.

- Git Integration (Recommended): Use Git for version control. This allows you to track changes, collaborate effectively, and revert to previous versions if needed. There are built-in Git features in VS Code.
- Jupyter Notebooks: If you use Jupyter Notebooks for experimentation and exploration, you can configure VS Code to launch and manage notebooks seamlessly through the Jupyter extension.

By following these steps, you'll have a well-structured virtual environment in VS Code, ready for your Data Science and Generative AI projects. Remember to activate the virtual environment whenever you want to work on your project to ensure you're using the correct dependencies.

Installing and Setting up Anaconda: Step-by-Step

Anaconda provides a convenient way to set up a Python environment pre-loaded with popular data science and machine learning libraries. Here's how to install Anaconda on your system:

1. Download the Anaconda Installer:

- Head over to the Anaconda website: https://www.anaconda.com/download
- Select the appropriate installer for your operating system (Windows, macOS, or Linux).
  - For most users, choosing the Python 3.x version is recommended.

2. Verify Installer Integrity (Optional):

- Anaconda recommends verifying the downloaded installer's integrity to ensure it hasn't been tampered with. You can find instructions on their website for different operating systems.

3. Run the Installer:

- Double-click the downloaded installer file.

4. Follow the Installation Steps:

The installation process will vary slightly depending on your operating system. Here's a general breakdown:

Windows:

- Click "Next" on the initial welcome screen.
- Read the license agreement and click "I Agree" if you accept the terms.
- **Choose Installation Type:**
  - Select "Just Me" for a single-user installation or "All Users" if you want it accessible to all users on the computer.
- **Select Installation Location:**
  - You can choose a custom location for installation, but the default is usually recommended (e.g., `C:\ProgramData\Anaconda3`).
- **Advanced Options (Optional):**
  - You can leave these options unchecked unless you have specific requirements.
- Click "Install" to begin the installation process.
- After installation, you can choose to register Anaconda or learn more about their cloud notebook service. Then, click "Finish."

macOS:

- Drag and drop the Anaconda application icon to your Applications folder. This completes the installation.

Linux:

- The installation process might involve using terminal commands based on the chosen installer type (graphical or command line). Refer to the Anaconda documentation for detailed instructions specific to your Linux distribution: https://docs.anaconda.com/free/anaconda/install/index.html

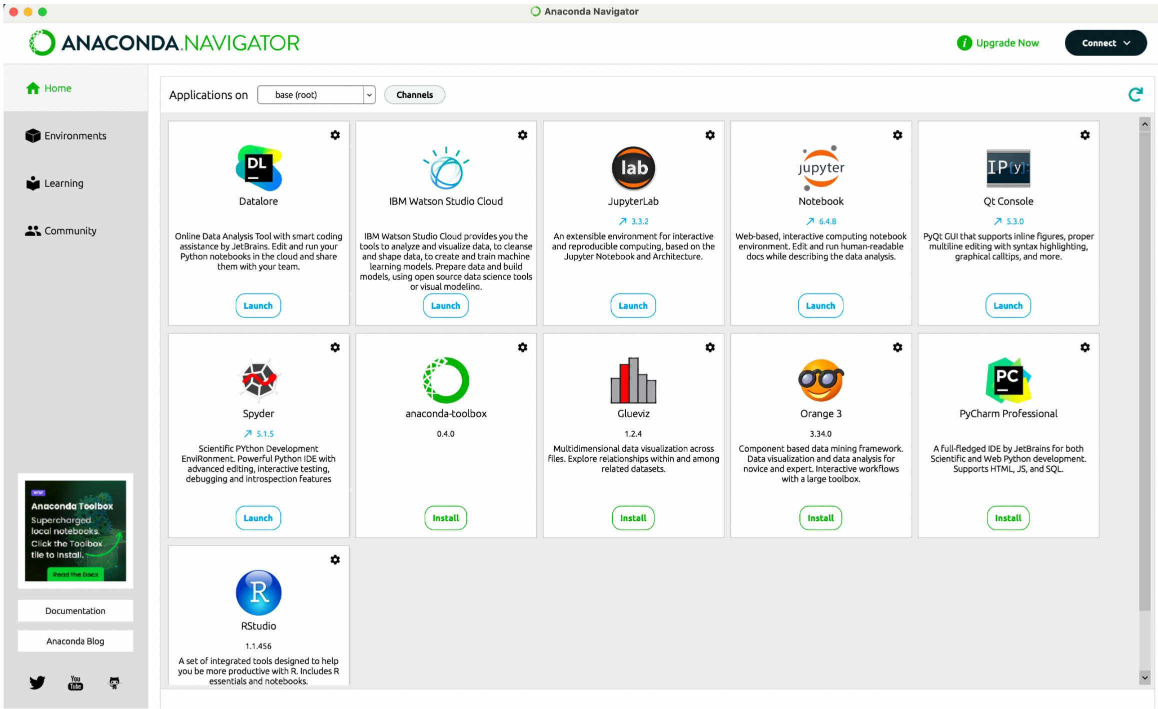
5. Verify Installation (Optional):

- Open a terminal or command prompt window.
- Type `conda --version` or `python --version` (depending on your preference).
- If the installation was successful, you should see the installed Anaconda or Python version information.

Additional Notes:

- **Adding Anaconda to PATH (Optional):**
  - During installation on Windows, you might be prompted to add Anaconda to your system PATH. This allows you to run Anaconda commands from any directory in the terminal. If you skipped this step, you can follow the instructions in the Anaconda documentation to add it manually.

When you invoke Anaconda, you will find the option to invoke Jupyter Notebook on the homepage.



Datalore
Online Data Analysis Tool with smart coding assistance by JetBrains. Edit and run your Python notebooks in the cloud and share them with your team.
Launch

IBM Watson Studio Cloud
IBM Watson Studio Cloud provides you the tools to analyze and visualize data, to cleanse and shape data, to create and train machine learning models. Prepare data and build models, using open source data science tools or visual modeling.
Launch

JupyterLab
↗ 3.3.2
An extensible environment for interactive and reproducible computing, based on the Jupyter Notebook and Architecture.
Launch

Notebook
↗ 6.4.8
Web-based, interactive computing notebook environment. Edit and run human-readable docs while describing the data analysis.
Launch

Qt Console
↗ 5.3.0
PyQt GUI that supports inline figures, proper multiline editing with syntax highlighting, graphical calltips, and more.
Launch

Spyder
↗ 5.1.5
Scientific PYthon Development EnviRonment. Powerful Python IDE with advanced editing, interactive testing, debugging and introspection features
Launch

anaconda-toolbox
0.4.0
Install

Glueviz
1.2.4
Multidimensional data visualization across files. Explore relationships within and among related datasets.
Install

Orange 3
3.34.0
Component based data mining framework. Data visualization and data analysis for novice and expert. Interactive workflows with a large toolbox.
Install

PyCharm Professional
A full-fledged IDE by JetBrains for both Scientific and Web Python development. Supports HTML, JS, and SQL.
Install

RStudio
1.1.456
A set of integrated tools designed to help you be more productive with R. Includes R essentials and notebooks.

By following these steps, you'll have Anaconda successfully installed and ready to use for your data science and machine learning projects!