

Lab 1: Introduction to Machine Learning and Environment Setup

1. Introduction

In this lab, we introduce the basics of Machine Learning (ML) and demonstrate how to set up a dedicated jupyter environment for ML experiments. We'll use the built-in `venv` module to create a virtual environment named `myenv`, where we will install essential ML libraries.

2. Objectives

- Understand what Machine Learning is.
- Create an isolated jupyter environment.
- Install foundational ML libraries such as numpy, pandas, matplotlib, and scikit-learn.
- Verify the environment setup with package installation.

3. Environment Setup Steps

1. Step 1: Open the Anaconda Prompt

Use the Start Menu to search and open 'anaconda Prompt'

2. Step 2: Create a Virtual Environment

Run the following command to create a virtual environment named myenv
python -m venv myenv

3. Step 3: Activate the Environment

Run the command below to activate the environment:
conda activate myenv

Screenshot: Creating and Activating the Environment

```
Anaconda Prompt
(base) C:\Users\AFNAN AHMAD>conda activate myenv
(myenv) C:\Users\AFNAN AHMAD>
```

4. Step 4: Install Required Machine Learning Libraries

Use pip to install ML libraries:

`pip install numpy pandas matplotlib scikit-learn`

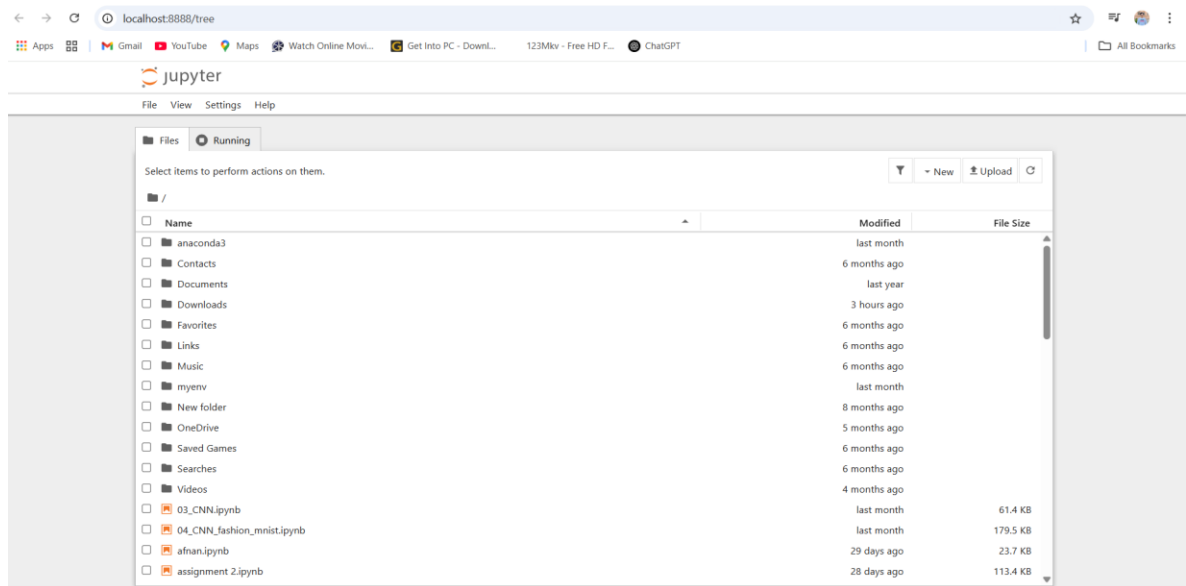
Screenshot: Installing Libraries

```
Anaconda Prompt
(base) C:\Users\AFNAN AHMAD>conda activate myenv
(myenv) C:\Users\AFNAN AHMAD>conda list
# packages in environment at C:\Users\AFNAN AHMAD\anaconda3\envs\myenv:
#
# Name                    Version            Build    Channel
# _tfflow_select          2.3.0              mkl
# absl-py                 2.2.0              pyhd8ed1ab_0  conda-forge
# aiohappyeyeballs        2.6.1              pyhd8ed1ab_0  conda-forge
# aiohttp                 3.11.18            py39hf73967f_0  conda-forge
# aiosignal               1.3.2              pyhd8ed1ab_0  conda-forge
# anyio                   4.7.0              py39haa95532_0
# argon2-cffi             21.3.0             pyhd3eb1b0_0
# argon2-cffi-bindings    21.2.0             py39h827c3e9_1
# asttokens               3.0.0              py39haa95532_0
# astunparse              1.6.3              pyhd8ed1ab_3
# async-lru                2.0.4              py39haa95532_0
# async-timeout            5.0.1              pyhd8ed1ab_1  conda-forge
# attrs                   24.3.0             py39haa95532_0
# babel                   2.16.0             py39haa95532_0
# backcall                0.2.0              pyhd3eb1b0_0
# beautifulsoup4          4.12.3             py39haa95532_0
# blas                    1.0                mkl
# bleach                   6.2.0              py39haa95532_0
# blinker                 1.9.0              pyhff2d567_0  conda-forge
# bottleneck              1.4.2              nv39hc99e966_0
```

5. Step5: Activate jupyter notebook.

Write in anocanda prompt “jupyter notebook”

```
(myenv) C:\Users\AFNAN AHMAD>jupyter notebook
```



4. Conclusion

In this lab, you successfully created a jupyter environment and installed key Machine Learning libraries. This setup ensures a clean, manageable, and reproducible workspace for all future ML projects.