



## LAB MANUAL

# Create Virtual Environment

# Lab Assignment: Creating and Using a Virtual Environment for a Python Project in Jupyter Notebook

## Objective

In this lab assignment, you will learn how to create a virtual environment for a Python project, manage its dependencies using `requirements.txt`, and run the project in Jupyter Notebook. **This ensures that the project-specific libraries do not interfere with the global Python environment.**

## Prerequisites

- Basic understanding of Python programming
- Anaconda or Python installed on your system.
- Basic knowledge of command-line operations

## Project Overview

You will create a simple Python project for displaying live news, that uses the following libraries:

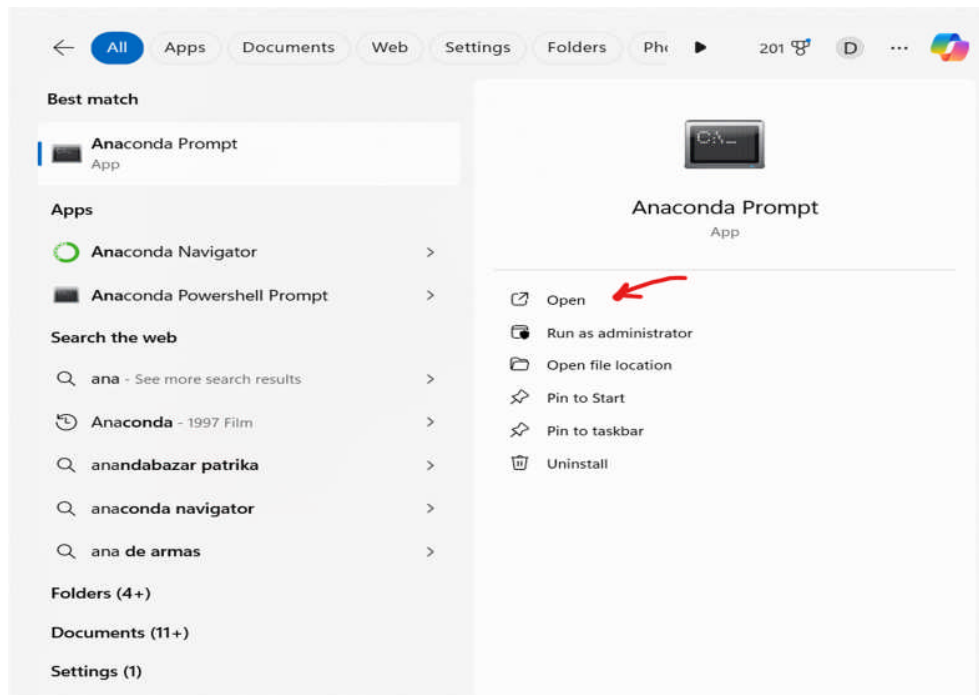
- `requests` for making HTTP requests
- `beautifulsoup4` for parsing HTML

You will create a Jupyter Notebook that fetches weather data from a public API, parses the data, and plots the temperature trend over a week.

## Solution

## Step-by-Step Instructions

### Step 1: Open Anaconda prompt.



### Step 2: Creating and Activating a Virtual Environment

**1. Create a Virtual Environment:** `conda create --name weather-env python=3.9`



```
Anaconda Prompt - conda cr x + v
The following packages will be downloaded:

package | build | size
-----|-----|-----
openssl-3.0.13 | h2bbff1b_2 | 7.5 MB
pip-24.0 | py39haa95532_0 | 2.8 MB
python-3.9.19 | h1aa4202_1 | 19.6 MB
setuptools-69.5.1 | py39haa95532_0 | 1003 KB
tzdata-2024a | h04d1e81_0 | 116 KB
vc-14.2 | h2eaa2aa_1 | 10 KB
vs2015_runtime-14.29.30133 | h43f2093_3 | 1.1 MB
wheel-0.43.0 | py39haa95532_0 | 137 KB
-----|-----|-----
Total: | 32.2 MB

The following NEW packages will be INSTALLED:

ca-certificates pkgs/main/win-64::ca-certificates-2024.3.11-haa95532_0
openssl pkgs/main/win-64::openssl-3.0.13-h2bbff1b_2
pip pkgs/main/win-64::pip-24.0-py39haa95532_0
python pkgs/main/win-64::python-3.9.19-h1aa4202_1
setuptools pkgs/main/win-64::setuptools-69.5.1-py39haa95532_0
sqlite pkgs/main/win-64::sqlite-3.45.3-h2bbff1b_0
tzdata pkgs/main/noarch::tzdata-2024a-h04d1e81_0
vc pkgs/main/win-64::vc-14.2-h2eaa2aa_1
vs2015_runtime pkgs/main/win-64::vs2015_runtime-14.29.30133-h43f2093_3
wheel pkgs/main/win-64::wheel-0.43.0-py39haa95532_0

Proceed ([y]/n)? y
```

```
Anaconda Prompt x + v
openssl pkgs/main/win-64::openssl-3.0.13-h2bbff1b_2
pip pkgs/main/win-64::pip-24.0-py39haa95532_0
python pkgs/main/win-64::python-3.9.19-h1aa4202_1
setuptools pkgs/main/win-64::setuptools-69.5.1-py39haa95532_0
sqlite pkgs/main/win-64::sqlite-3.45.3-h2bbff1b_0
tzdata pkgs/main/noarch::tzdata-2024a-h04d1e81_0
vc pkgs/main/win-64::vc-14.2-h2eaa2aa_1
vs2015_runtime pkgs/main/win-64::vs2015_runtime-14.29.30133-h43f2093_3
wheel pkgs/main/win-64::wheel-0.43.0-py39haa95532_0

Proceed ([y]/n)? y

Downloading and Extracting Packages

Preparing transaction: done
Verifying transaction: done
Executing transaction: done
#
# To activate this environment, use
#
#   $ conda activate weather-env
#
# To deactivate an active environment, use
#
#   $ conda deactivate

(base) C:\Users\dulari>
```

## 2. Activate the Virtual Environment:

conda activate weather-env

```
(base) C:\Users\dulari>conda activate weather-env
```

Once it is activated it will look like this

```
(weather-env) C:\Users\dulari>
```

## Step 3: Installing Dependencies

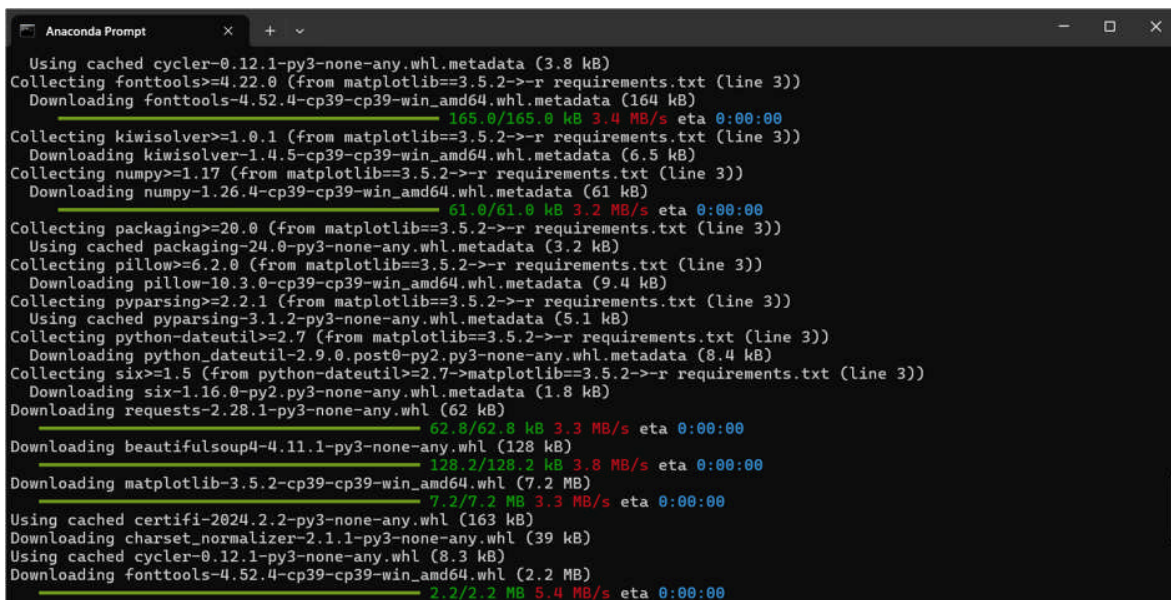
Download requirements.txt file .

### 1. Install Dependencies from `requirements.txt`:

`pip install -r requirements.txt`

```
(weather-env) C:\Users\dulari>cd Downloads
```

```
(weather-env) C:\Users\dulari\Downloads>pip install -r requirements.txt
```



```
Using cached cython-0.12.1-py3-none-any.whl.metadata (3.8 kB)
Collecting fonttools>=4.22.0 (from matplotlib==3.5.2->-r requirements.txt (line 3))
  Downloading fonttools-4.52.4-cp39-cp39-win_amd64.whl.metadata (164 kB)
    165.0/165.0 kB 3.4 MB/s eta 0:00:00
Collecting kiwisolver>=1.0.1 (from matplotlib==3.5.2->-r requirements.txt (line 3))
  Downloading kiwisolver-1.4.5-cp39-cp39-win_amd64.whl.metadata (6.5 kB)
Collecting numpy>=1.17 (from matplotlib==3.5.2->-r requirements.txt (line 3))
  Downloading numpy-1.26.4-cp39-cp39-win_amd64.whl.metadata (61 kB)
    61.0/61.0 kB 3.2 MB/s eta 0:00:00
Collecting packaging>=20.0 (from matplotlib==3.5.2->-r requirements.txt (line 3))
  Using cached packaging-24.0-py3-none-any.whl.metadata (3.2 kB)
Collecting pillow>=6.2.0 (from matplotlib==3.5.2->-r requirements.txt (line 3))
  Downloading pillow-10.3.0-cp39-cp39-win_amd64.whl.metadata (9.4 kB)
Collecting pyparsing>=2.2.1 (from matplotlib==3.5.2->-r requirements.txt (line 3))
  Using cached pyparsing-3.1.2-py3-none-any.whl.metadata (5.1 kB)
Collecting python-dateutil>=2.7 (from matplotlib==3.5.2->-r requirements.txt (line 3))
  Downloading python_dateutil-2.9.0.post0-py2.py3-none-any.whl.metadata (8.4 kB)
Collecting six>=1.5 (from python-dateutil>=2.7->matplotlib==3.5.2->-r requirements.txt (line 3))
  Downloading six-1.16.0-py2.py3-none-any.whl.metadata (1.8 kB)
  Downloading requests-2.28.1-py3-none-any.whl (62 kB)
    62.0/62.0 kB 3.3 MB/s eta 0:00:00
  Downloading beautifulsoup4-4.11.1-py3-none-any.whl (128 kB)
    128.2/128.2 kB 3.8 MB/s eta 0:00:00
  Downloading matplotlib-3.5.2-cp39-cp39-win_amd64.whl (7.2 MB)
    7.2/7.2 MB 3.3 MB/s eta 0:00:00
Using cached certifi-2024.2.2-py3-none-any.whl (163 kB)
  Downloading charset_normalizer-2.1.1-py3-none-any.whl (39 kB)
Using cached cython-0.12.1-py3-none-any.whl (8.3 kB)
  Downloading fonttools-4.52.4-cp39-cp39-win_amd64.whl (2.2 MB)
    2.2/2.2 MB 5.4 MB/s eta 0:00:00
```

### 2. Install Jupyter and IPython Kernel:

`conda install jupyter ipykernel`

```
(weather-env) C:\Users\dulari\Downloads>conda install jupyter ipykernel
```



```
Anaconda Prompt - conda in X + -
typing-extensions pkgs/main/win-64::typing-extensions-4.11.0-py39haa95532_0
typing_extensions pkgs/main/win-64::typing_extensions-4.11.0-py39haa95532_0
urllib3 pkgs/main/win-64::urllib3-2.2.1-py39haa95532_0
wcwidth pkgs/main/noarch::wcwidth-0.2.5-pyhd3eb1b0_0
webencodings pkgs/main/win-64::webencodings-0.5.1-py39haa95532_1
websocket-client pkgs/main/win-64::websocket-client-1.8.0-py39haa95532_0
widgetsnbextension pkgs/main/win-64::widgetsnbextension-4.0.10-py39haa95532_0
win_inet_pton pkgs/main/win-64::win_inet_pton-1.1.0-py39haa95532_0
winpty pkgs/main/win-64::winpty-0.4.3-4
xz pkgs/main/win-64::xz-5.4.6-h8cc25b3_1
yaml pkgs/main/win-64::yaml-0.2.5-he774522_0
zeromq pkgs/main/win-64::zeromq-4.3.5-hd77b12b_0
zipp pkgs/main/win-64::zipp-3.17.0-py39haa95532_0
zlib pkgs/main/win-64::zlib-1.2.13-h8cc25b3_1
zstd pkgs/main/win-64::zstd-1.5.5-hd43e919_2

Proceed ([y]/n)? y
```

### Downloading and Extracting Packages

```
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
```

## 3. Create a Kernel for the Virtual Environment:

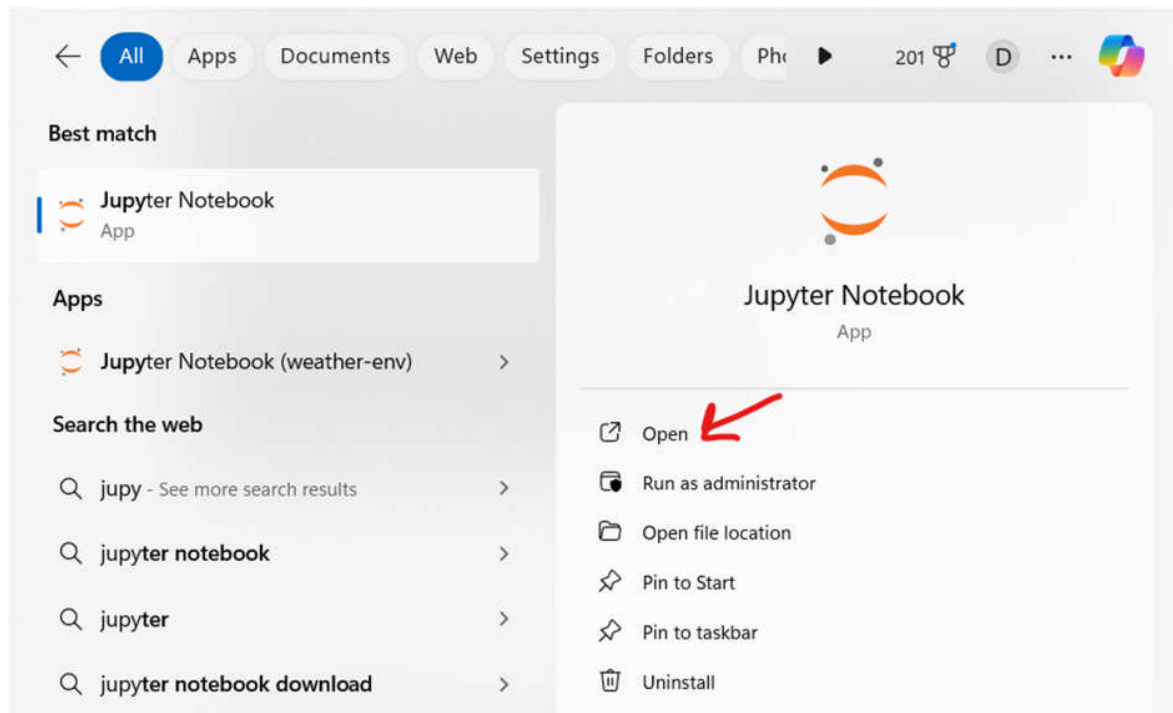
```
python -m ipykernel install --user --name weather-env --display-name
"Python (weather-env)"
```

```
(weather-env) C:\Users\dulari\Downloads>python -m ipykernel install --user --name weather-env --display-name "Python (weather-env)"
```

## Output

```
Installed kernelspec weather-env in C:\Users\dulari\AppData\Roaming\jupyter\kernels\weather-env
```

## Step 4: Creating the Jupyter Notebook



### 1. Start Jupyter Notebook:

jupyter notebook

### 2. Create a New Notebook:

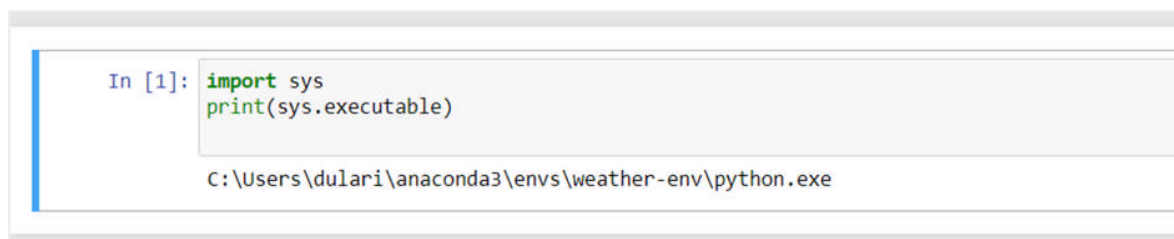
- In the Jupyter Notebook interface, click on `New` -> `Python (weather-env)` to create a new notebook that uses the `weather-env` virtual environment.



### 3. Verify Kernel:

- In the new notebook, run the following command to verify that the correct Python interpreter is being used:

```
import sys  
print(sys.executable)
```



```
In [1]: import sys  
        print(sys.executable)  
  
C:\Users\dulari\anaconda3\envs\weather-env\python.exe
```

- This should print the path to the Python interpreter within the `weather-env` virtual environment.

## Step 5: Writing the Jupyter Notebook

### 1. Add the Following Code to the Notebook:

```
import requests  
from bs4 import BeautifulSoup  
  
# URL of the website to scrape  
url = 'https://www.bbc.com/news'  
  
# Define the User-Agent header to mimic a browser request  
headers = {
```



```
'User-Agent': 'Mozilla/5.0 (Windows NT 10.0; Win64; x64)
AppleWebKit/537.36 (KHTML, like Gecko) Chrome/125.0.0.0
Safari/537.36'
}
```

```
# Send a GET request to the website
```

```
response = requests.get(url, headers=headers)
```

```
# Check if the request was successful
```

```
if response.status_code == 200:
```

```
    # Parse the HTML content of the page
```

```
    soup = BeautifulSoup(response.content, 'html.parser')
```

```
# Find the elements containing the headlines
```

```
headlines = soup.find_all('a', class_="sc-2e6baa30-0 gILusN")
```

```
# Print the headlines
```

```
print("Latest BBC News Headlines:")
```

```
for headline in headlines:
```

```
    print(headline.text.strip())
```

```
else:
```

```
    print(f"Error fetching news data: {response.status_code}")
```

Output:

Latest BBC News Headlines:

British Broadcasting Corporation

Home

Sport

Video

Audio

Weather

Jeremy Bowen: Ukraine faces its worst crisis since the war beganThe composure Ukrainians show in the face of Russian attacks cannot conceal the dangers Kyiv faces in the summer ahead.6 hrs agoNewsBBC InDepth

Singapore Airlines: 'Turbulence landed five of my family in ICU'A week on, passengers and family reveal to the BBC what happened on Flight SQ321.2 hrs agoNewsAsia

Modi's party volunteers targeting 100,000 people a dayIndia's governing party is far ahead of its rivals in digital campaigning, especially on WhatsApp.6 hrs agoNewsIndia

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Singapore Airlines: 'Turbulence landed five of my family in ICU'A week on, passengers and family reveal to the BBC what happened on Flight SQ321.2 hrs agoNewsAsia

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Deadly landslide threatens thousands more as hopes for survivors fadeAn evacuation alert has been put out in Papua New Guinea, days after a deadly landslide.2 hrs agoNewsAsia

What will Trump jury decide? Here are the three optionsA verdict could come this week - the former president's conviction or acquittal, or there could be a mistrial.3 hrs agoNewsUS & Canada

Modi's party volunteers targeting 100,000 people a dayIndia's governing party is far ahead of its rivals in digital campaigning, especially on WhatsApp.6 hrs agoNewsIndia

## Conclusion

This lab assignment helps you understand how to create a virtual environment, install specific dependencies using a `requirements.txt` file, and run a Jupyter Notebook within the virtual environment. This approach is crucial for maintaining clean and manageable project environments, especially when working with multiple projects with different dependencies.