Attempt Summary – Senithu Perera - 104208468

Introduction

This is the report of the attempt made for v0.1 and P1, Screenshots were taken during the testing process to document the outputs and any issues encountered. These screenshots provide a visual summary of the testing process and the current state of the project.

Initial Code base v0.1

The initial code base v0.1 serves as the foundational structure for a stock price prediction model using a recurrent neural network (RNN), specifically focusing on a Long Short-Term Memory (LSTM) network in Python. The code is organized to facilitate the prediction of a stock's next-day closing price based on the last 60 days of historical data. The model's primary objective is to provide a basic introduction to machine learning concepts, rather than producing highly accurate predictions for investment purposes.

The code begins by importing essential Python libraries such as `numpy` for numerical operations, `matplotlib` for plotting, `pandas` for data manipulation, and TensorFlow/Keras for building the neural network. It utilizes `pandas_datareader` to fetch historical stock price data, which is then preprocessed by scaling the closing prices between 0 and 1 using `MinMaxScaler` from `scikit-learn`.

The LSTM model is constructed using TensorFlow's Sequential API, with multiple LSTM layers interspersed with dropout layers to mitigate overfitting. A dense layer at the end produces the final prediction. The model is compiled with the Adam optimizer and mean squared error as the loss function, reflecting its regression task.

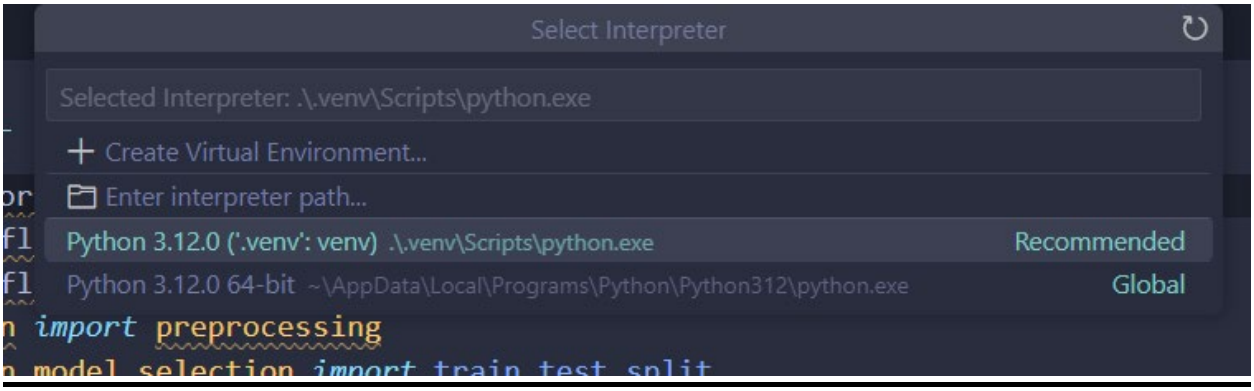
The code also includes functionality for evaluating the model's accuracy by comparing its predictions to actual historical prices. Despite its simplicity, the v0.1 code base offers a solid introduction to the concepts of RNNs, LSTMs, and time-series forecasting, laying the groundwork for more sophisticated models in future iterations.

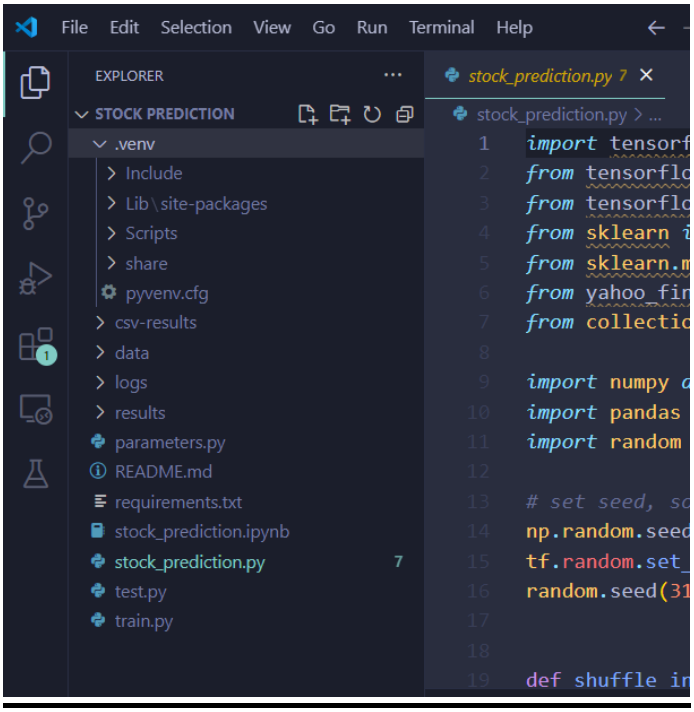
Setting up Virtual Environment

On this stage the virtual environment was created in visual studio code using the following code in a new terminal

```
PS D:\Swinburne\Year 2 - Sem 2\Intellgent Systems\Stock Prediction> python3 -m venv .venv
```

Then after terminating the terminal, the correct version of the python interpreter was selected to the virtual environment. If this is not selected the libraries will not be resolved into the code base from vs code





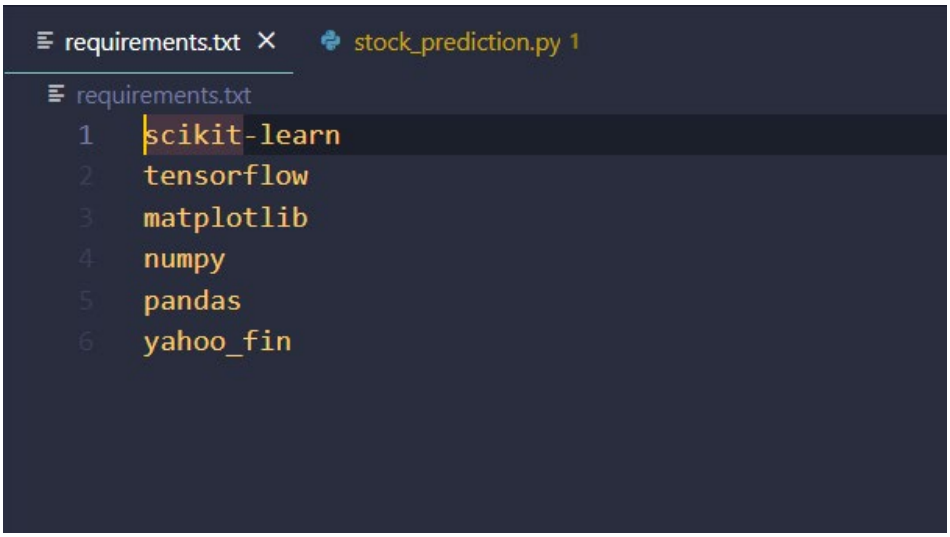
Creating the Requirements.txt

A requirements file was created to list all the necessary packages. This file is essential for setting up the environment consistently across different systems.

```
[notice] A new release of pip is available: 23.2.1 -> 24.2
[notice] To update, run: python.exe -m pip install --upgrade pip
PS D:\Swinburne\Year 2 - Sem 2\Intellgent Systems\Stock Prediction> pip3 install -r requirements.txt
Requirement already satisfied: scikit-learn in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from -r requirements.txt (line
1)) (1.5.1)
Requirement already satisfied: tensorflow in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from -r requirements.txt (line 2)
) (2.17.0)
Requirement already satisfied: matplotlib in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from -r requirements.txt (line 3)
) (3.9.2)
Requirement already satisfied: numpy in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from -r requirements.txt (line 4)) (1.
26.4)
Requirement already satisfied: pandas in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from -r requirements.txt (line 5)) (2
.2.2)
Requirement already satisfied: yahoo_fin in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from -r requirements.txt (line 6))
 (0.8.9.1)
Requirement already satisfied: scipy>=1.6.0 in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from scikit-learn->-r requireme
nts.txt (line 1)) (1.14.0)
Requirement already satisfied: joblib>=1.2.0 in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from scikit-learn->-r requirem
ents.txt (line 1)) (1.4.2)
Requirement already satisfied: threadpoolctl>=3.1.0 in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from scikit-learn->-r r
equirements.txt (line 1)) (3.5.0)
```

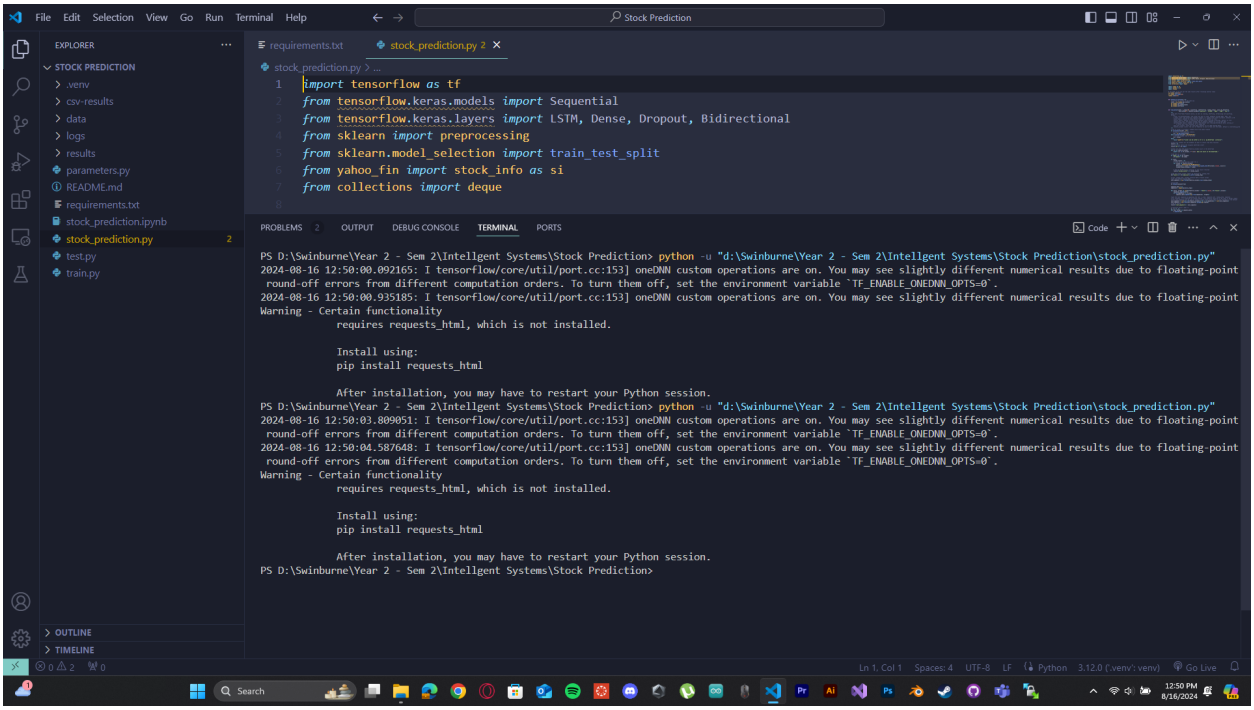
```
Requirement already satisfied: lxml>=2.1 in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from pyquery->requests-html->yahoo
_fin->-r requirements.txt (line 6)) (5.3.0)
Requirement already satisfied: cssselect>=1.2.0 in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from pyquery->requests-html
->yahoo_fin->-r requirements.txt (line 6)) (1.2.0)
Requirement already satisfied: zipp>=0.5 in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from importlib-metadata>=1.4->pypp
eteer>=0.0.14->requests-html->yahoo_fin->-r requirements.txt (line 6)) (3.20.0)
Requirement already satisfied: colorama in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from tqdm<5.0.0,>=4.42.1->pyppeteer
>=0.0.14->requests-html->yahoo_fin->-r requirements.txt (line 6)) (0.4.6)
Requirement already satisfied: MarkupSafe>=2.1.1 in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from werkzeug>=1.0.1->tens
orboard<2.18,>=2.17->tensorflow-intel==2.17.0->tensorflow->-r requirements.txt (line 2)) (2.1.5)
Requirement already satisfied: soupsieve>1.2 in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from beautifulsoup4->bs4->requ
ests-html->yahoo_fin->-r requirements.txt (line 6)) (2.6)
Requirement already satisfied: markdown-it-py>=2.2.0 in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from rich->keras>=3.2.
0->tensorflow-intel==2.17.0->tensorflow->-r requirements.txt (line 2)) (3.0.0)
Requirement already satisfied: pygments<3.0.0,>=2.13.0 in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from rich->keras>=3.
2.0->tensorflow-intel==2.17.0->tensorflow->-r requirements.txt (line 2)) (2.18.0)
Requirement already satisfied: mdurl~=0.1 in d:\swinburne\year 2 - sem 2\intellgent systems\stock prediction\.venv\lib\site-packages (from markdown-it-py>=2.2.0->rich-
>keras>=3.2.0->tensorflow-intel==2.17.0->tensorflow->-r requirements.txt (line 2)) (0.1.2)

[notice] A new release of pip is available: 23.2.1 -> 24.2
[notice] To update, run: python.exe -m pip install --upgrade pip
PS D:\Swinburne\Year 2 - Sem 2\Intellgent Systems\Stock Prediction>
```

When the code was ran without editing anything in the requirements file, an error comes up, this error can be solved by changing the ‘sklearn’ statement in the file to ‘scikit-learn’

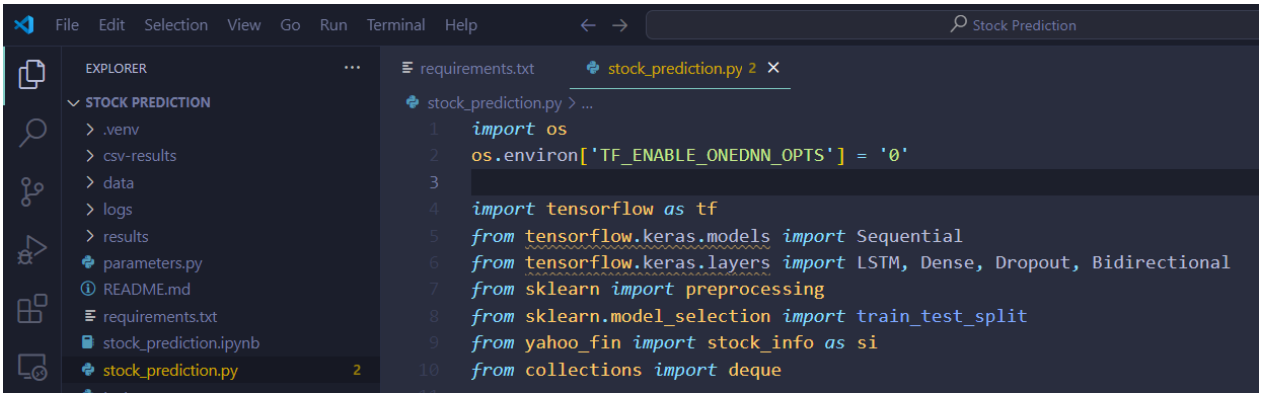


Fixing the Environment Variable Error

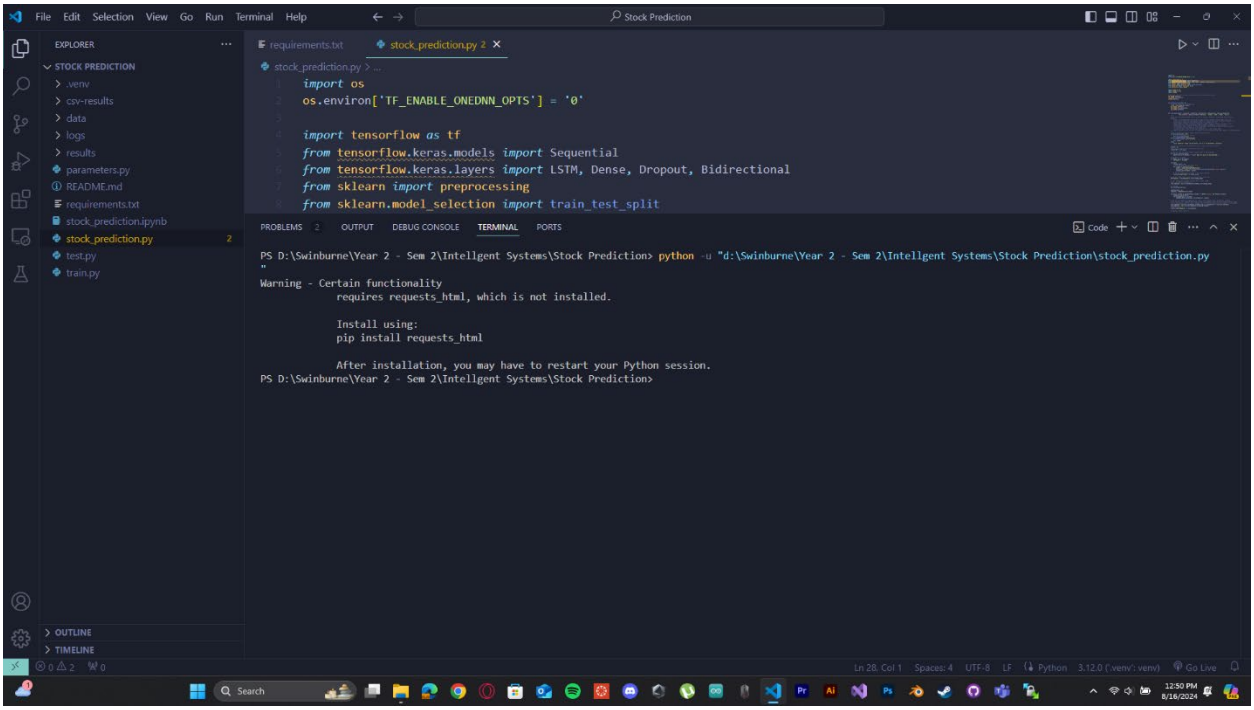
An error was encountered when running the code as is, the error is referred in the following screen shot,



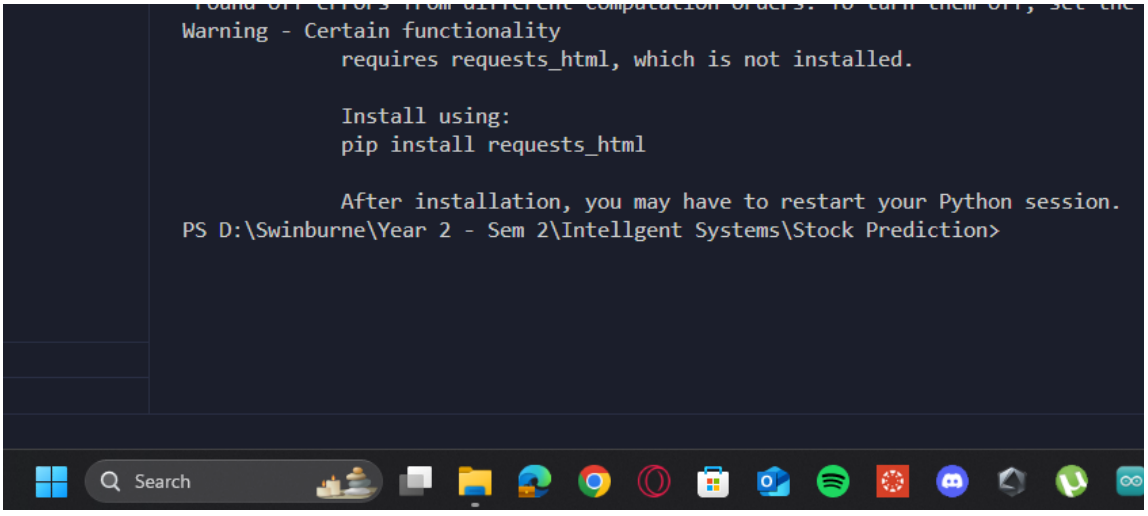
this error can be resolved by adding By Importing the library “OS” we can change the environment variable in runtime



Error fixed :-

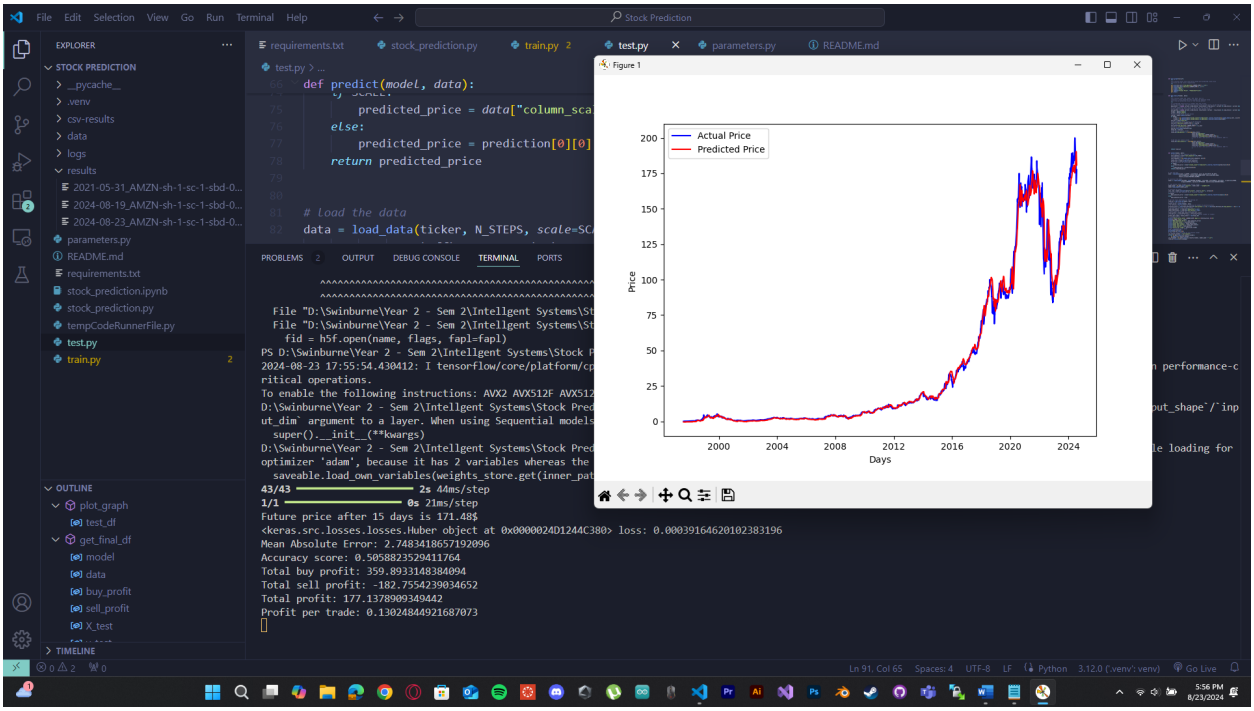


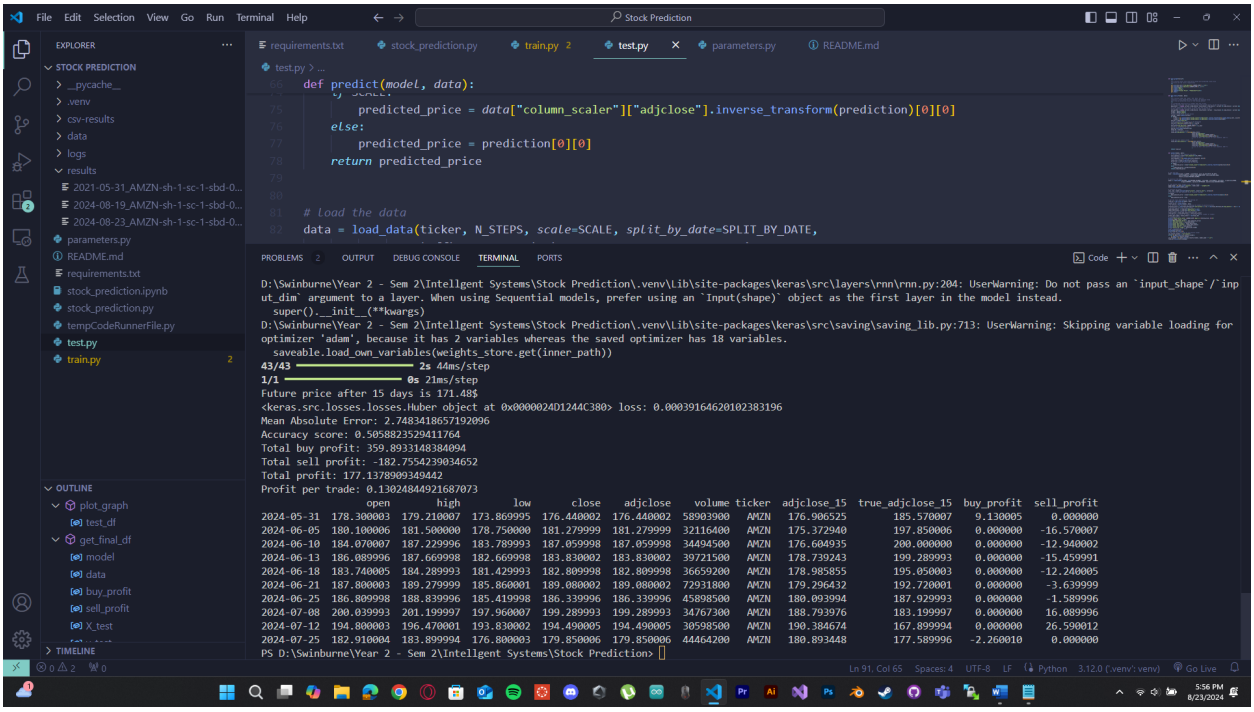
Fixing the error related to requests_html library




```
import requests_html // This will be added on top of the code
```

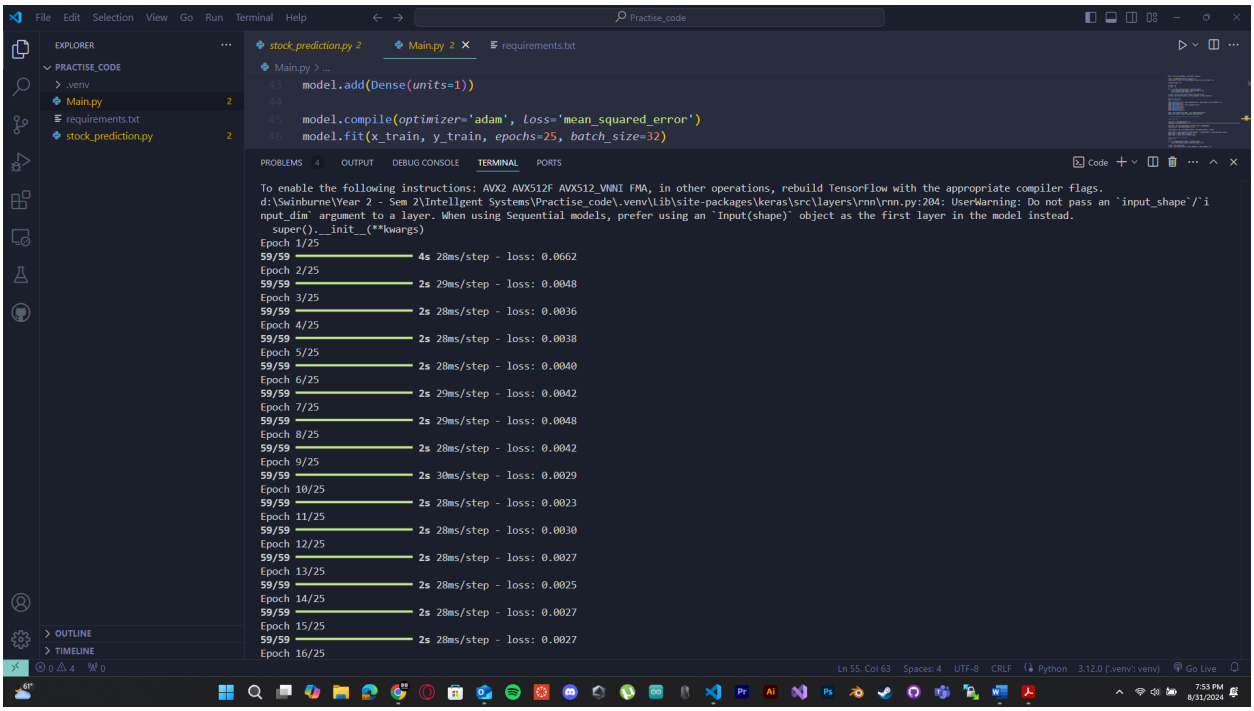
Even after restarting the python session this wouldn't work, the solution come down to adding an import statement with the library at the top





V 01 update code base Output

Training



Output