



FIT3164

User Guides

Meta-Learning for Stock Market Forecasting

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1. End User Guide

This section explains the web dashboard layout and guides the user on how to access and use the web dashboard.

1.1 Web Application Layout

No.	Name	Purpose
1.	Popular Stocks Tab	Show some popular stock markets.
2.	Header	Show the search bar and name of the web dashboard.
3.	Search Bar	Allow users to search for a stock ticker.
4.	Time Range Button	Allow user to view the
5.	Toolbar	Allow users to reset graph, screenshot chart image, download chart image, and enter or exit fullscreen.
6.	ToolTip	Show detailed stock price information.
7.	Key Statistics Tab	Show the company information.
8.	Stock Price Chart	Show OHLC (open, high, low, close) chart and volume chart.
9.	Prediction Chart	A line chart to visualise the prediction results.

Table 1 Description of web dashboard features



Fig 1. Landing Page

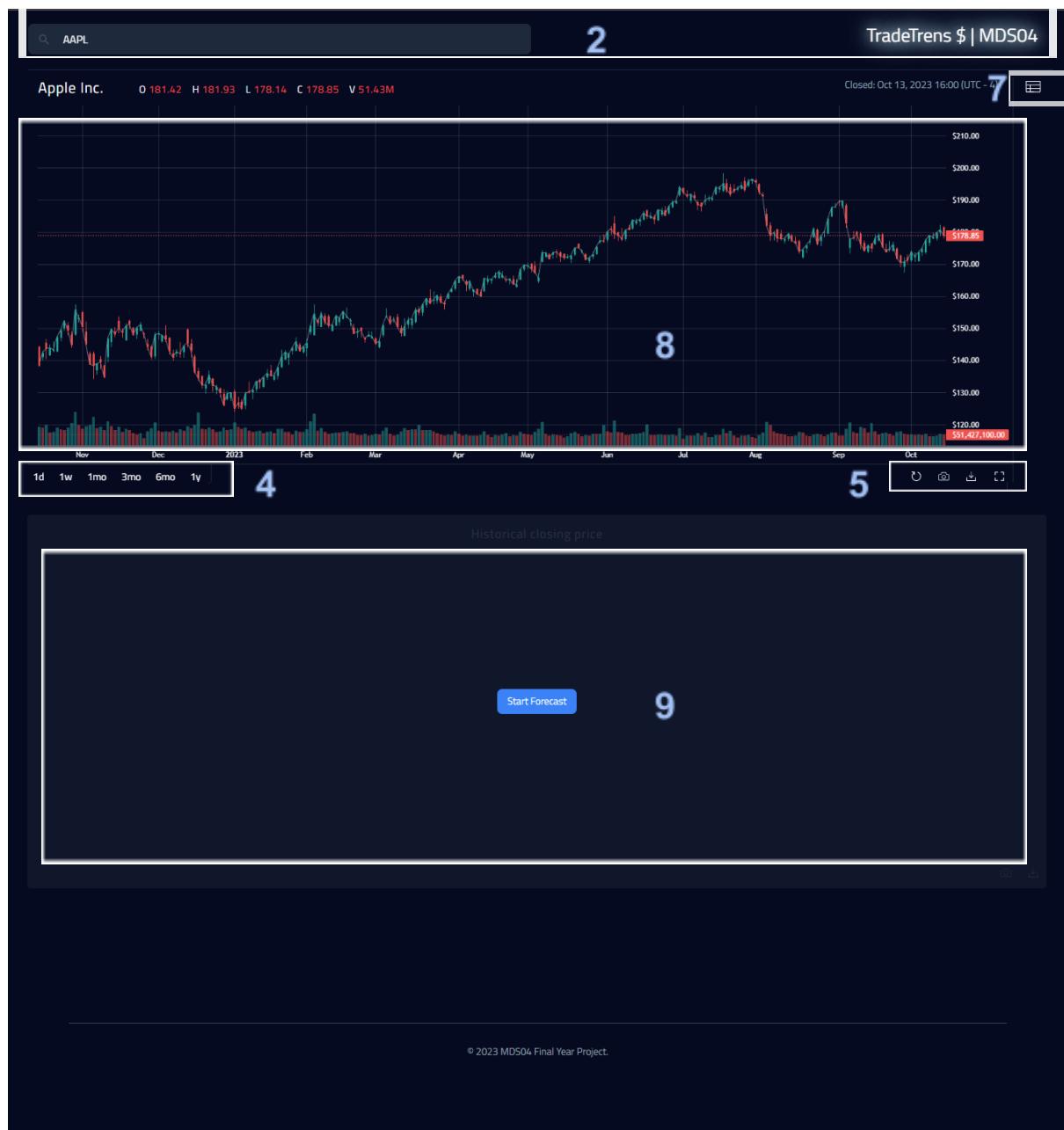


Fig 2. Main Page

1.2 Accessing web dashboard

1.2.1 Starting the web dashboard

1. Unzip, install required softwares, and launch the stock market forecasting software according to the instructions given in **2. Technical Guide**.
2. The web dashboard should be accessible in web browser at <http://localhost:3000/>

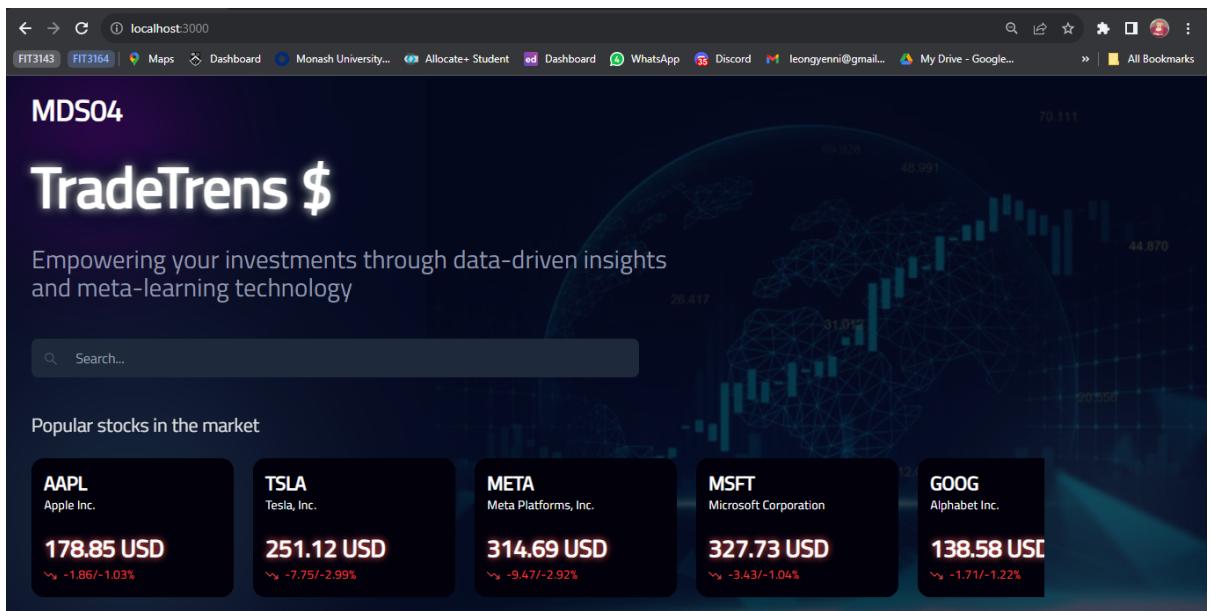


Fig 5. Landing page of web dashboard

1.2.2 Navigate to main page

1. Search for a valid stock ticker symbol using the search bar. Invalid input will not be found.

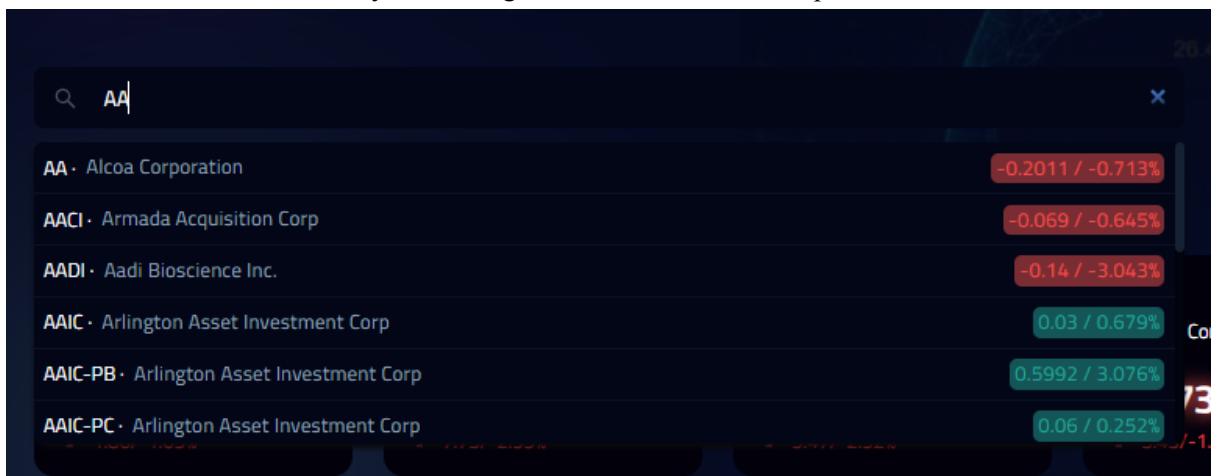


Fig 6. Valid search ticker symbol

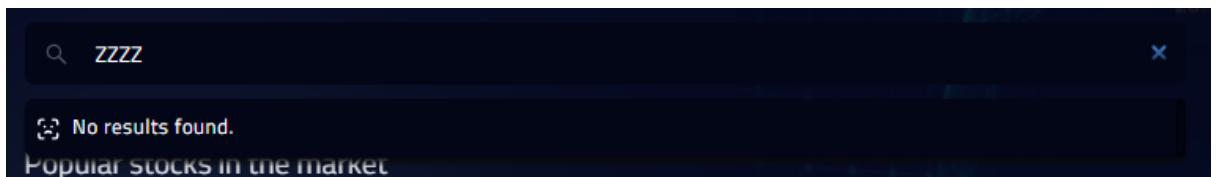


Fig 7. Invalid search ticker symbol

- Or, click on the stock company's container.



Fig 8. Popular stocks

- Enter the main page. The main page displays the stock information and predicted stock price.



Fig 9. AAPL stock information is displayed on the main page of web dashboard

- Users can search for other stock tickers using the search bar in the header section.

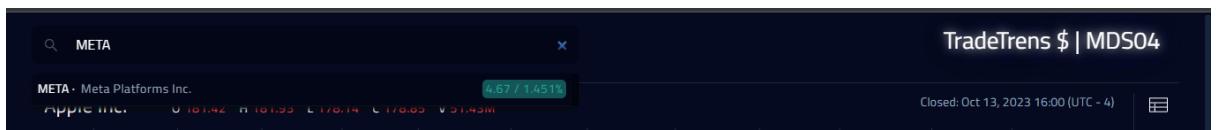


Fig 10. Valid search ticker symbol

1.2.3 Navigate back to landing page

- Click on the name of the web dashboard on the top right corner.



Fig 11. Header section

- Back to the landing page.

1.2.4 Accessing prediction results of a stock company.

- Scroll down to the prediction chart section.

2. Click on the “Start Forecast” button.

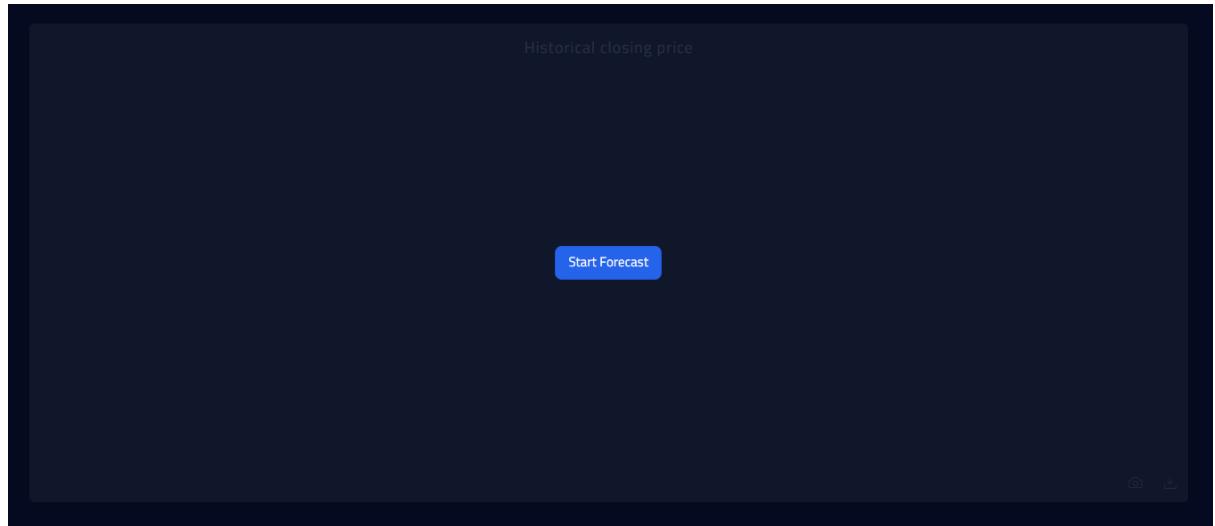


Fig 12. Start forecast button

3. The prediction result is shown. The white line represents the predicted stock price. The blue line indicates the previous day or previous week stock price.

- **Daily prediction:**

The **white line** shows the daily **stock price prediction** in an hour interval. The **blue line** represents stock price over the **previous trading day** in an hour interval.

- **Weekly prediction:**

The **white line** shows weekly **stock price prediction** in a one day interval. The **blue line** represents stock price over the **past 7 trading days** in one day interval.



Fig 13. Predicted stock price chart

4. Select to view daily stock price prediction or weekly stock price prediction using the drop down menu.



Fig 14. Daily stock price prediction

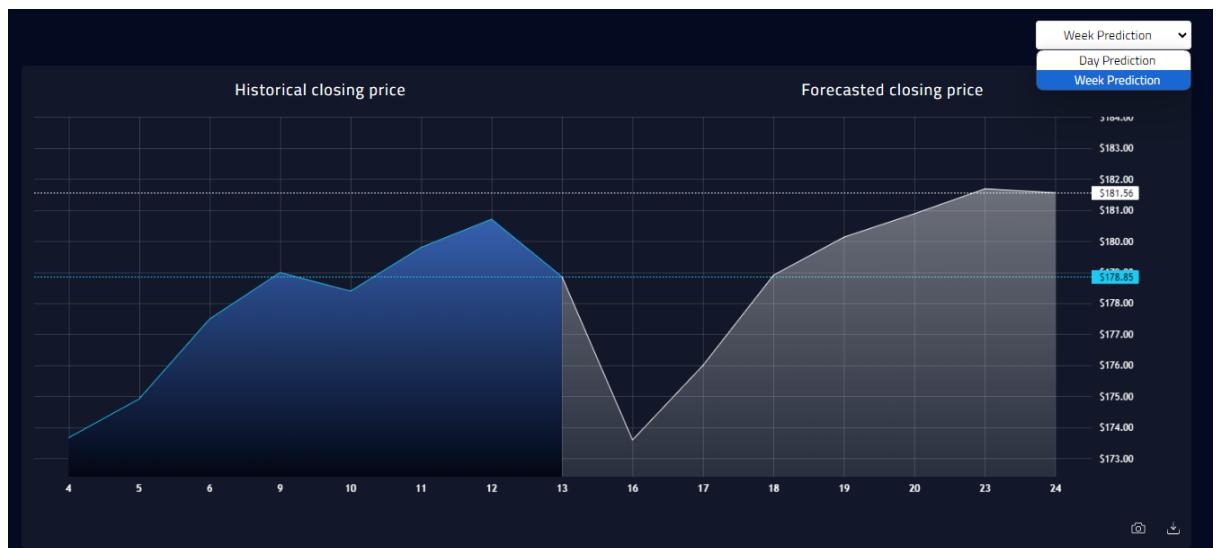


Fig 15. Weekly stock price prediction

- Upon hovering over the graph, a tooltip will appear to show the date and stock price.



Fig 15. Tooltip showing date, time and closing price in USD

6. On the bottom right corner, there is a toolbar and the description of each tool is shown the tool icon when the cursor hovers over the icon. The functionality of each tool is described as below:

- **Screenshot:**

A screenshot of the predicted stock price chart is copied to the clipboard and the user can paste (or CTRL + V) the screenshot.



Fig 16. Predicted stock price chart screenshot is copied to the clipboard

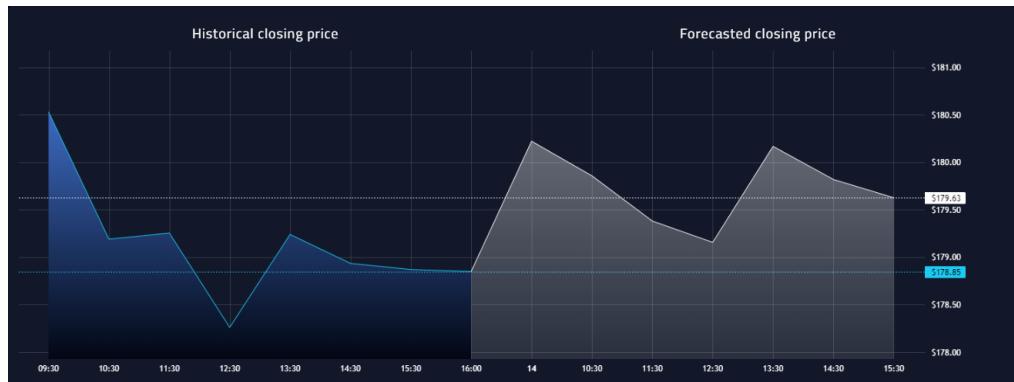


Fig 17. Screenshot of the predicted stock price chart

- **Download:**

A screenshot of the predicted stock price chart is downloaded to the user's local computer as .png image.



Fig 17. Predicted stock price chart image is downloaded in local computer

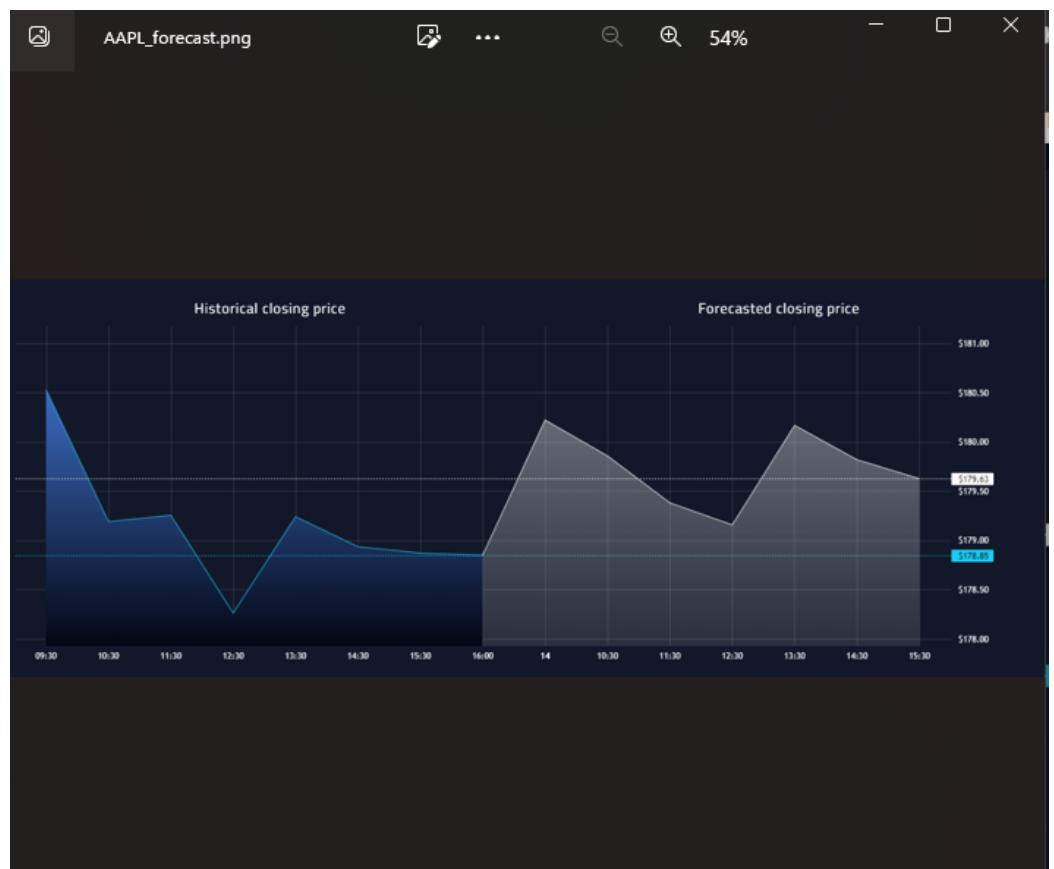


Fig 18. Downloaded chart image

7. An overview of the prediction results is shown below the chart.

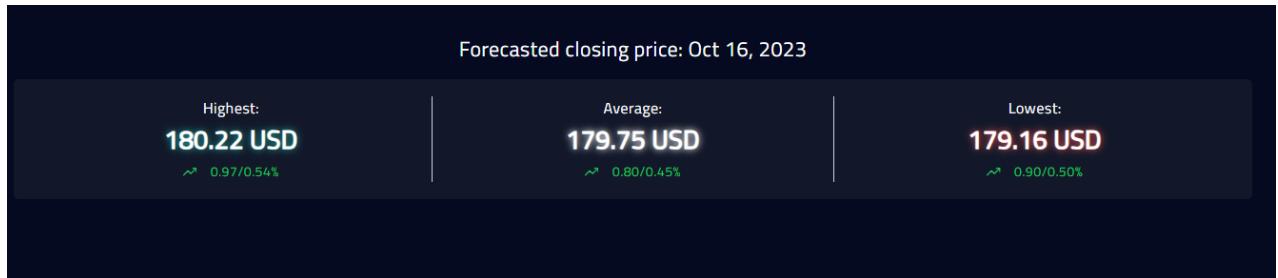


Fig 19. Highest, average and lowest predicted stock price for 16/10/2023

1.2.5 Accessing the stock price information

1. The visualisation below shows the OHLC (Open, High, Low, Close) Chart and Volume Chart.

Note: OHLC (Open-High-Low-Close) is a method to summarize the stock's price movement within a period, showing its starting, highest, lowest, and ending prices. It helps traders to assess market trends and understand how the stock behaved during that time. Trading volume represents the total number of shares or contracts were bought and sold, indicating market activity and influencing price changes.

2. Users can perform pinch zoom to zoom in and zoom out the chart.
3. Users can also perform vertical and horizontal scrolling.
4. To reset the chart view, the user can click on the reset button on the toolbar.

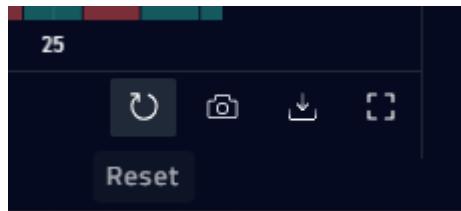


Fig 20. Reset button

5. Features of this section are explained below:

a. Tooltip:

A tooltip appears when hovering over the chart, displaying the date, time, and closing price of the selected point. The values of the open, high, low stock prices, close price, and volume for the selected data point are shown above the chart.

- O: Open price
- H: High price
- L: Low price
- C: Close price
- V: Volume



Fig 21. Tooltip showing date, time and closing stock price. The value of OHLC and volume is shown on the top of the visualisation.

b. Time range button:

Click on the time range button to view the stock price of different time ranges. Each time range is in different time intervals as summarised below.

Time Range	Time Interval
1 year (1y)	1 day
6 months (6mo)	1 day
3 months (3mo)	1 day
1 month (1mo)	1 day
1 week (1w)	30 minutes
1 day (1d)	5 minutes



Fig 22. Stock price information over past 3 months

c. Key statistics tab:

Click on the table icon on the right side menu to view the key statistics of the stock ticker.



Fig 23. Key statistics tab is shown on the right side of the visualisation

d. Toolbar:

On the bottom right corner, there is a toolbar and the description of each tool is shown the tool icon when the cursor hovers over the icon.

- **Reset:** Reset the chart view
- **Screenshot:** The screenshot of the chart image is copied to the clipboard



Fig 24. Screenshot of stock price chart

- **Download:** Chart image is downloaded to user local computer



Fig 25. Downloaded stock price chart image

- **Fullscreen:** Enter or exit the chart fullscreen



Fig 26. Stock price chart in fullscreen mode

1.2.6 Exiting the web dashboard

1. Click on the X button on the web browser tab and refer to detailed instructions on stopping servers in **2.5 Exit Stock Market Forecasting Software**.

2. Technical Guide

2.1 Download and install Python 3.9

1. Download and install Python3.9 from <https://www.python.org/downloads/release/python-390/>

Python 3.9.0

Release Date: Oct. 5, 2020

This is the stable release of Python 3.9.0.

Note: The release you're looking at is Python 3.9.0, a legacy release. Python 3.11 is now the latest feature release series of Python 3. [Get the latest release of 3.11.x here.](#)

Installer news

This is the first version of Python to default to the 64-bit installer on Windows. The installer now also actively disallows installation on Windows 7. Python 3.9 is incompatible with this unsupported version of Windows.

Major new features of the 3.9 series, compared to 3.8

Some of the new major new features and changes in Python 3.9 are:

- [PEP 573](#), Module State Access from C Extension Methods
- [PEP 584](#), Union Operators in `dict`

Fig 27. Page for downloading Python

- Select according to Operating System.

Files

Version	Operating System	Description	MD5 Sum	File Size	GPG
Gzipped source tarball	Source release		e19e75ec81dd04de27797bf3f9d918fd	26724009	SIG
XZ compressed source tarball	Source release		6ebfe157f6e88d9eabfbaf3fa92129f6	18866140	SIG
macOS 64-bit installer	macOS	for OS X 10.9 and later	16ca86fa3467e75bade26b8a9703c27f	31132316	SIG
Windows help file	Windows		9ea6fc676f0fa3b95af3c5b3400120d6	8757017	SIG
Windows x86-64 embeddable zip file	Windows	for AMD64/EM64T/x64	60d0d94337ef657c2cca1d3d9a6dd94b	8387074	SIG
Windows x86-64 executable installer	Windows	for AMD64/EM64T/x64	b61a33dc28f13b561452f3089c87eb63	28158664	SIG
Windows x86-64 web-based installer	Windows	for AMD64/EM64T/x64	733df85afb160482c5636ca09b89c4c8	1364352	SIG
Windows x86 embeddable zip file	Windows		d81fc534080e10bb4172ad7ae3da5247	7553872	SIG
Windows x86 executable installer	Windows		4a2812db8ab9f2e522c96c7728cfccb	27066912	SIG
Windows x86 web-based installer	Windows		cdbfa799e6760c13d06d0c2374110aa3	1327384	SIG

Fig 28. Versions of Python to download

- Select “Add Python 3.9 to PATH”

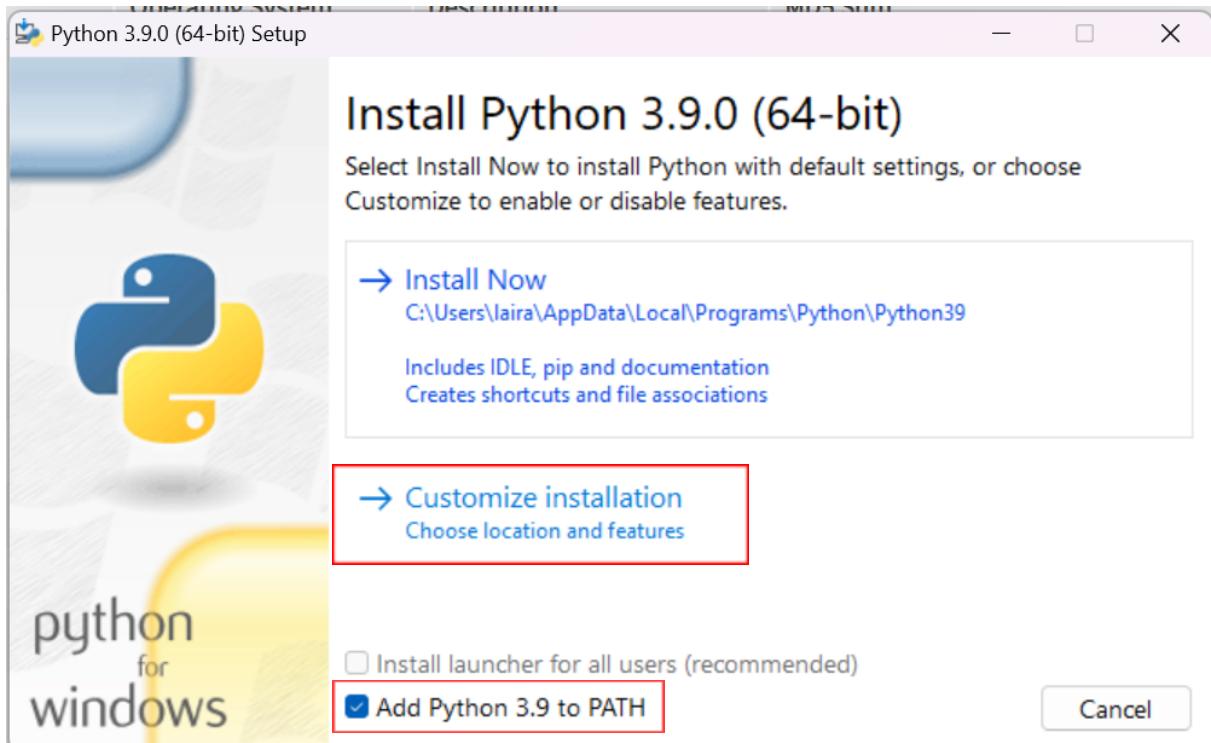


Fig 29. Python Installation 1

- Keep the default features and click “Next”.

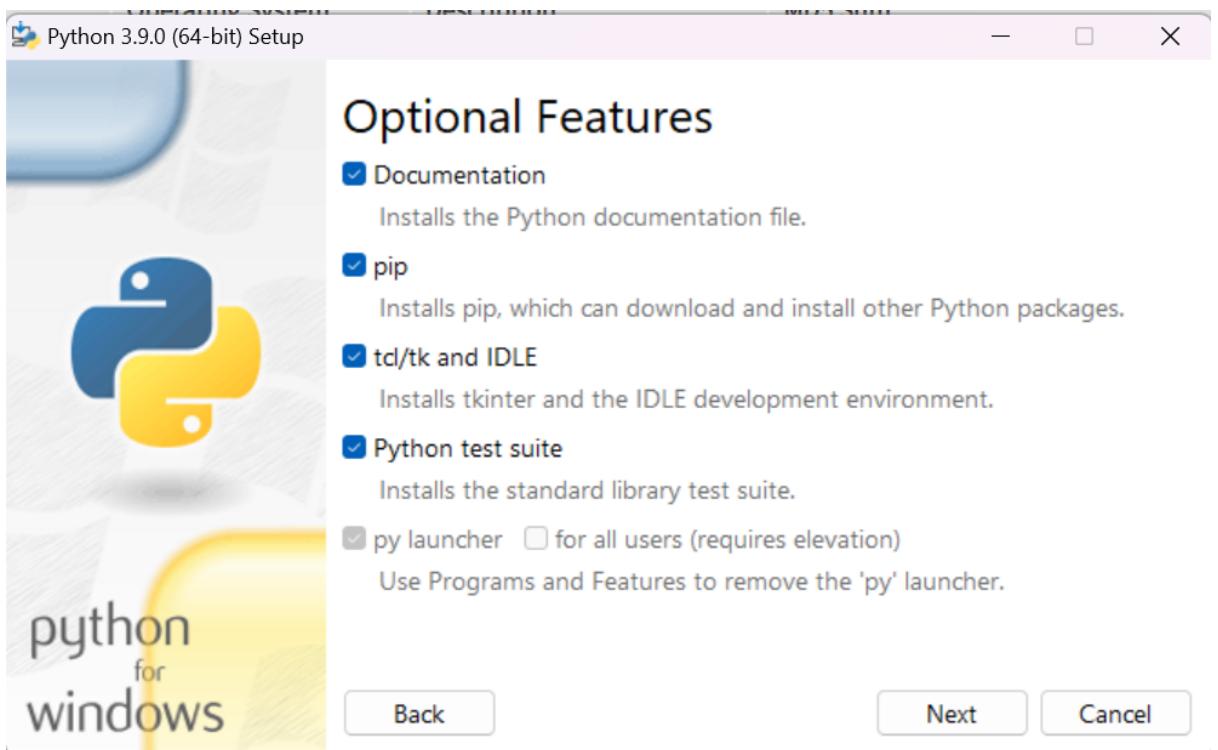


Fig 30. Python Installation 2

5. Click “**Browse**” if you want to customize install location (*Ensure the folder’s name where Python 3.9 is downloaded does not contain spaces). Then click “**Install**”.

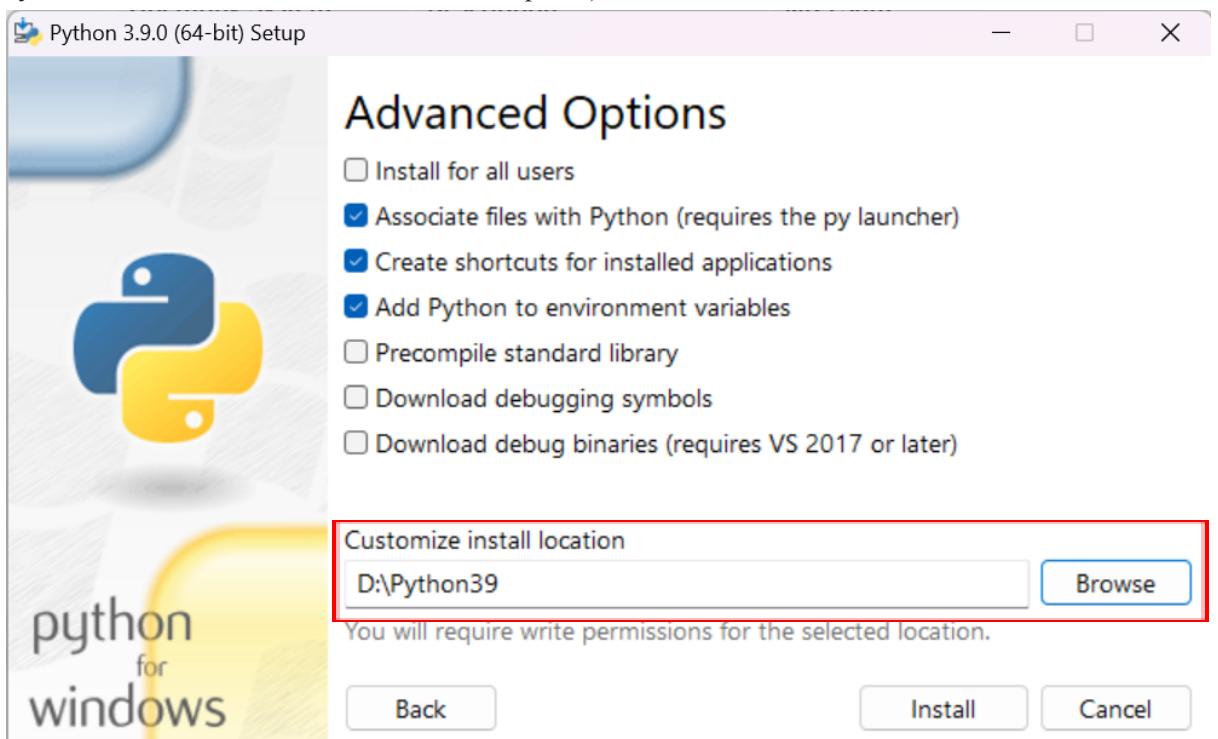


Fig 31. Python Installation 3

6. The window below will be shown if the setup of Python 3.9 is successfully installed. Click “**Close**” to exit.

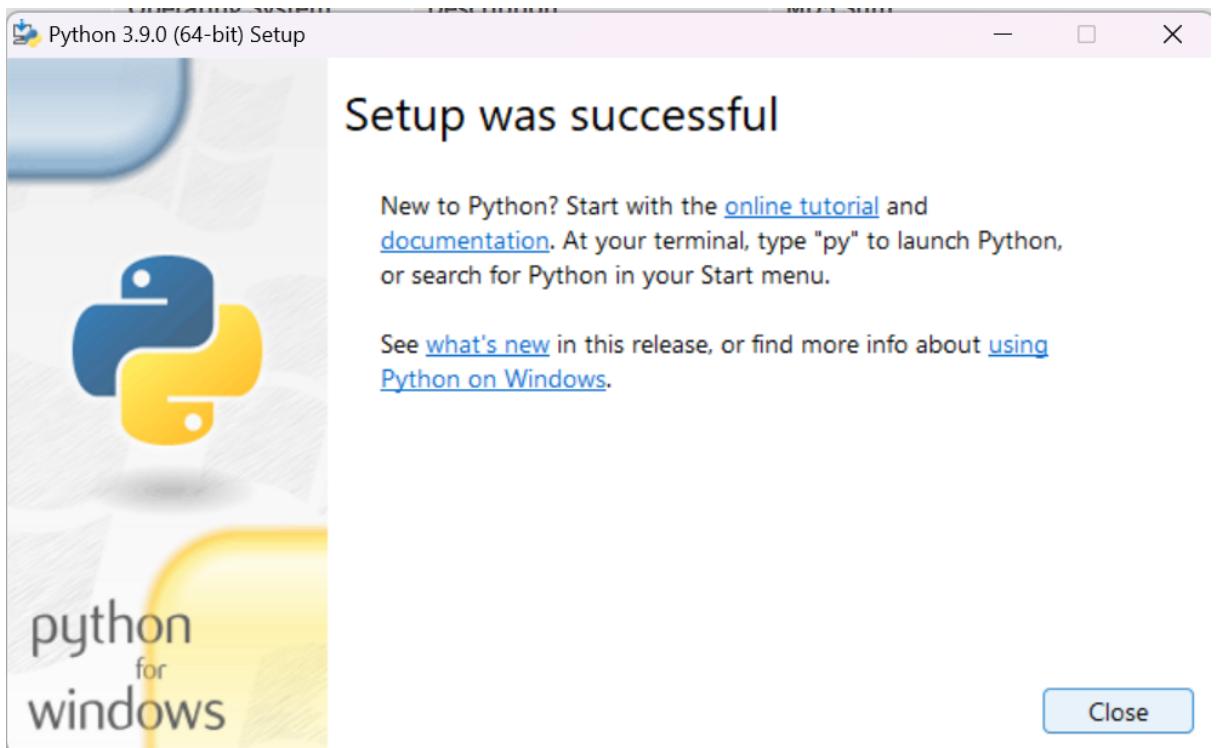


Fig 32. Python Installation 4

2.2 Download and install Node.js

1. Download and install Node.js from <https://nodejs.org/en/download>, select according to Operation System.

A screenshot of the Node.js Downloads page. The top navigation bar includes links for HOME, ABOUT, DOWNLOADS, DOCS, GET INVOLVED, SECURITY, CERTIFICATION, and NEWS. There is also a dark mode toggle icon. The main content is divided into two sections: "LTS Recommended For Most Users" and "Current Latest Features".

LTS
Recommended For Most Users

- Windows Installer (node-v18.18.2-x64.msi)
- macOS Installer (node-v18.18.2.pkg)
- Source Code (node-v18.18.2.tar.gz)

Current
Latest Features

Platform	Architecture
Windows	32-bit
Windows	64-bit
macOS	64-bit / ARM64
Linux	64-bit
Linux	ARM64
ARM	ARMv7
ARM	ARMv8
Source Code (node-v18.18.2.tar.gz)	

Fig 33. Page to download Node.js

2. Click "Next".

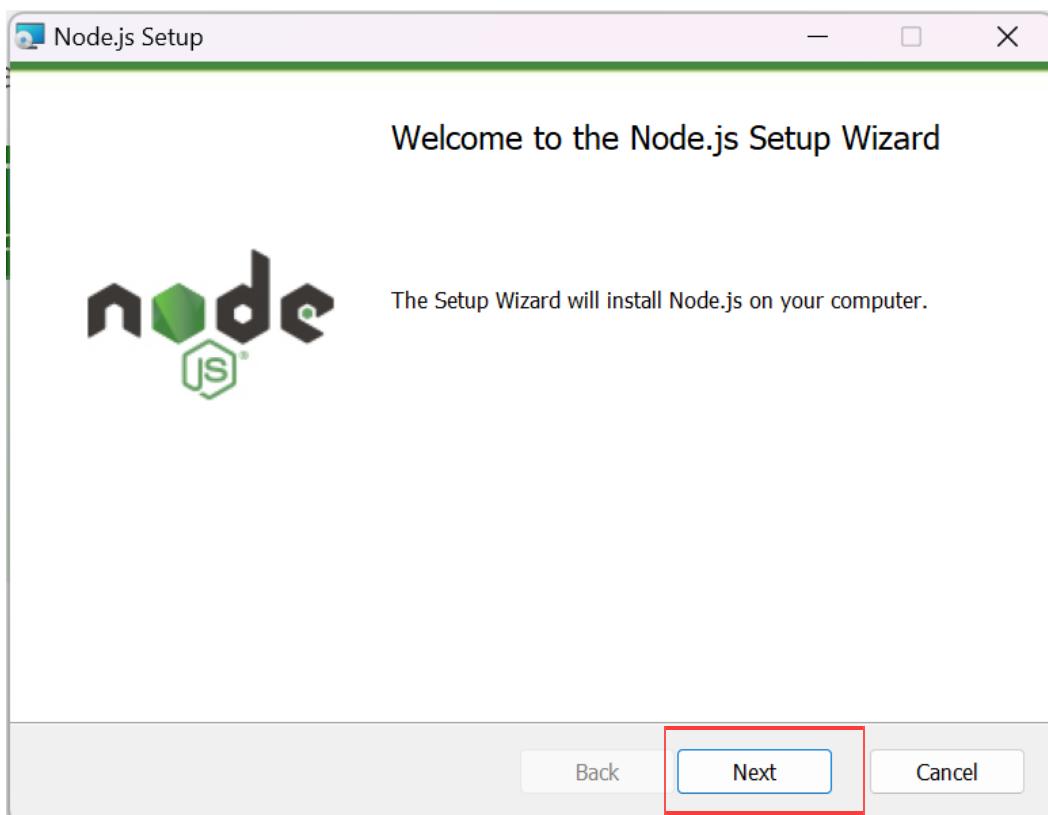


Fig 34. Node.js Installation 1

3. Check the checkbox and click "Next".

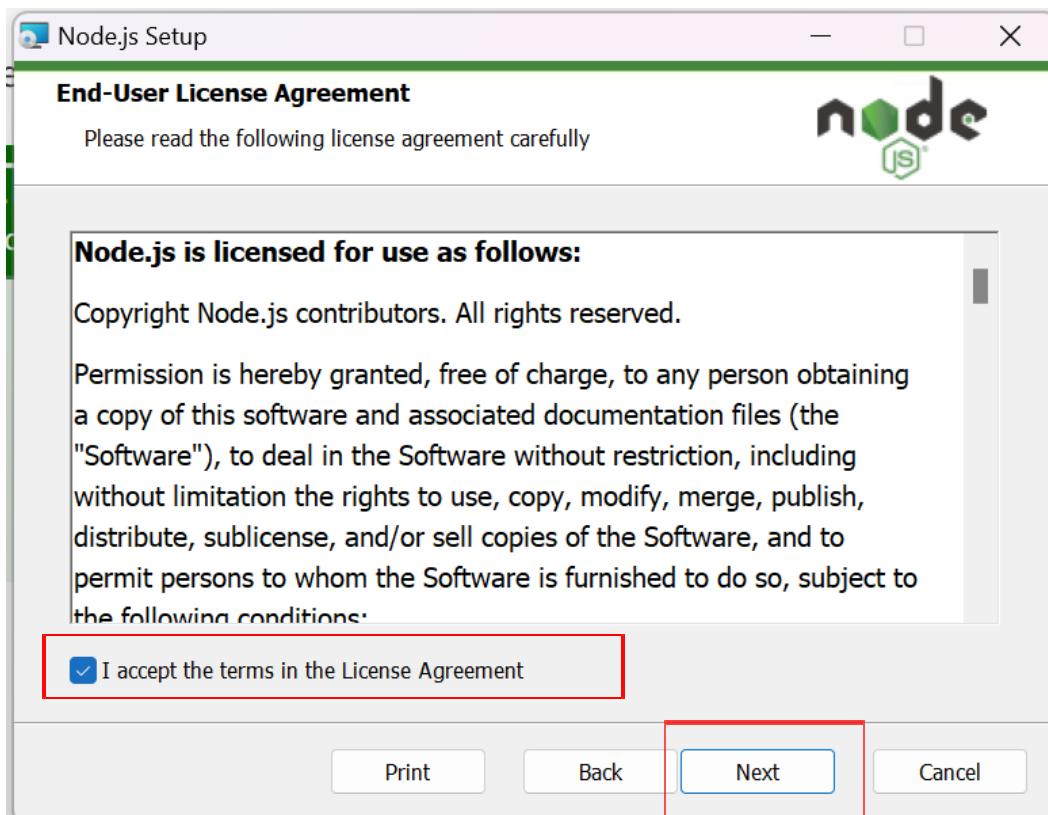


Fig 35. Node.js Installation 2

4. Select a folder to install Node.js. *Ensure the folder's name where Node.js is downloaded does not contain spaces). Then, click “Next”.

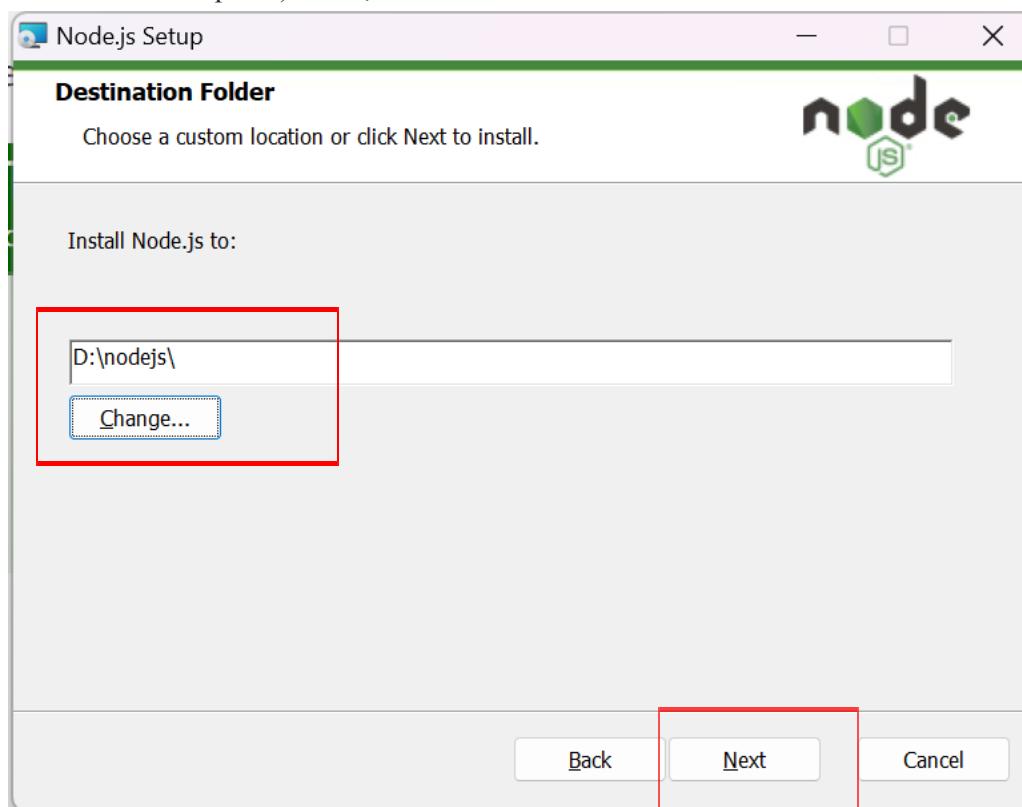


Fig 36. Node.js Installation 3

7. Keep the default setup and click “Next”.

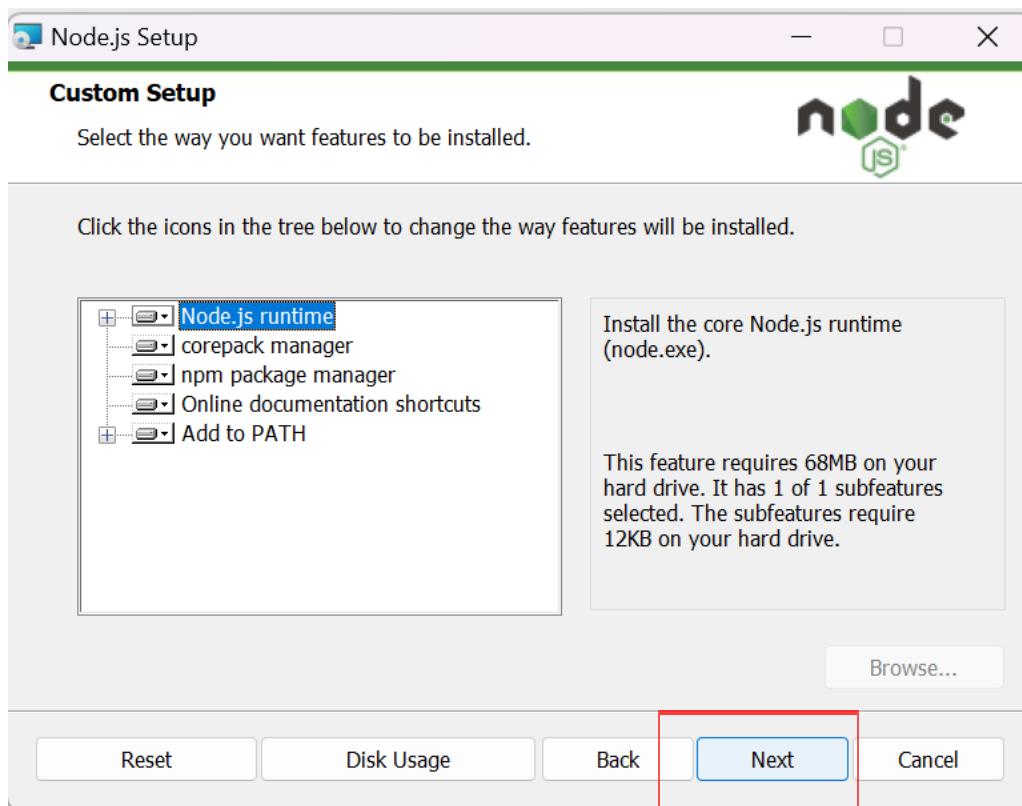


Fig 37. Node.js Installation 4

8. Installing tools for native modules is optional. Click “Next”.

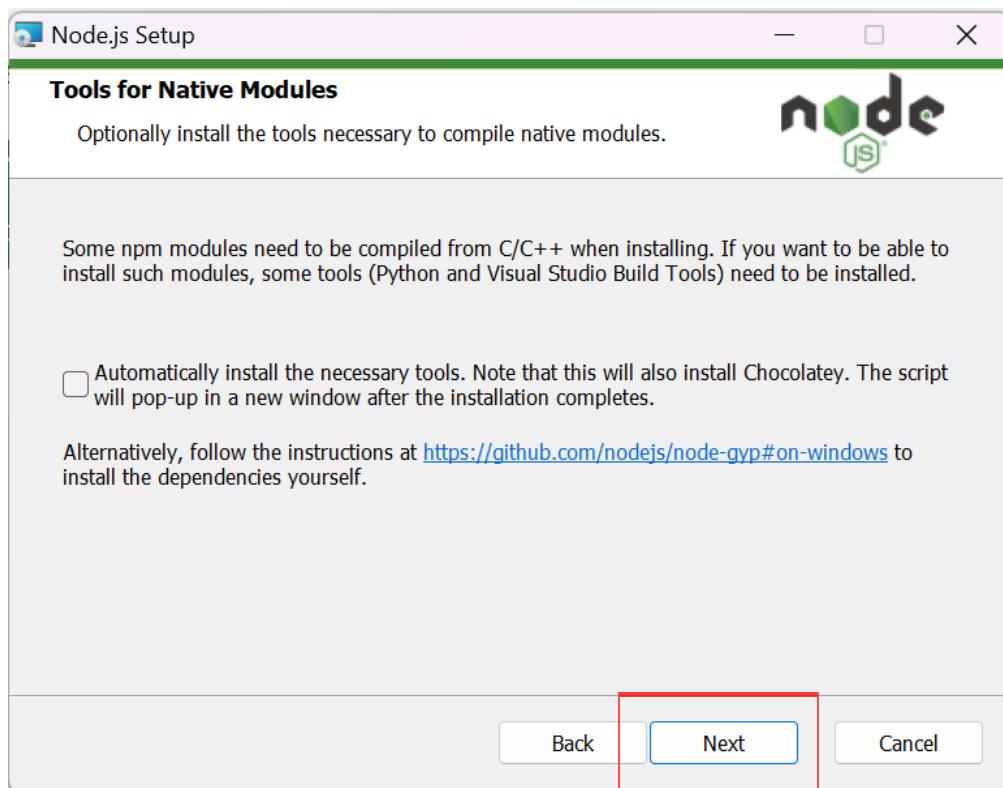


Fig 38. Node.js Installation 5

9. Click “Install”.

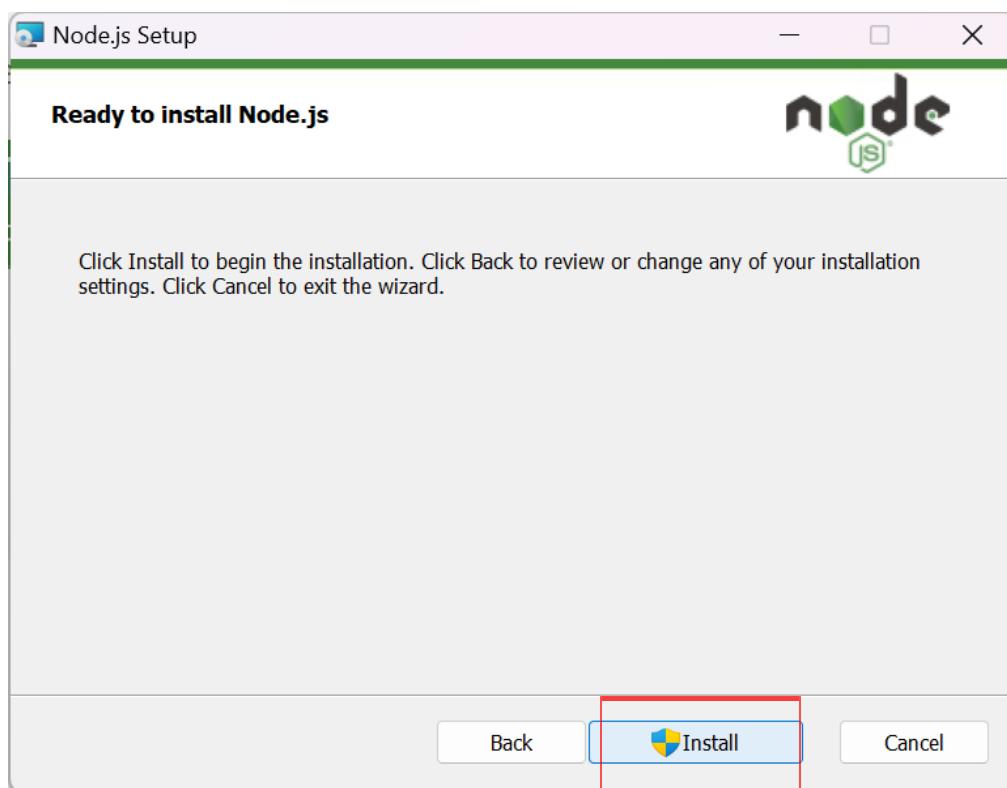


Fig 39. Node.js Installation 6

10. The window below will be shown if installation of Node.js is successfully installed. Click “Finish” to exit.

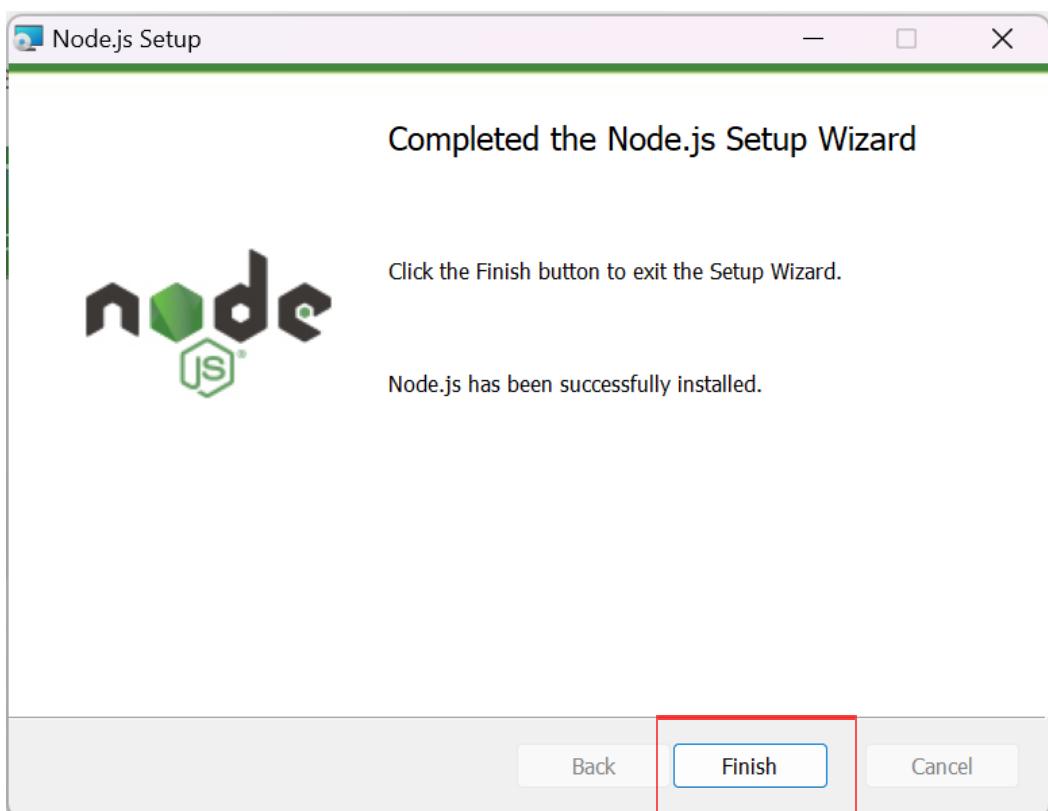


Fig 40. Node.js Installation 7

2.3 Download Stock Market Forecasting Software

1. Download the software from

<https://drive.google.com/file/d/1wmWdxPMJrOH0eLFq49B1c61nhZWFWfZY/view?usp=sharing>

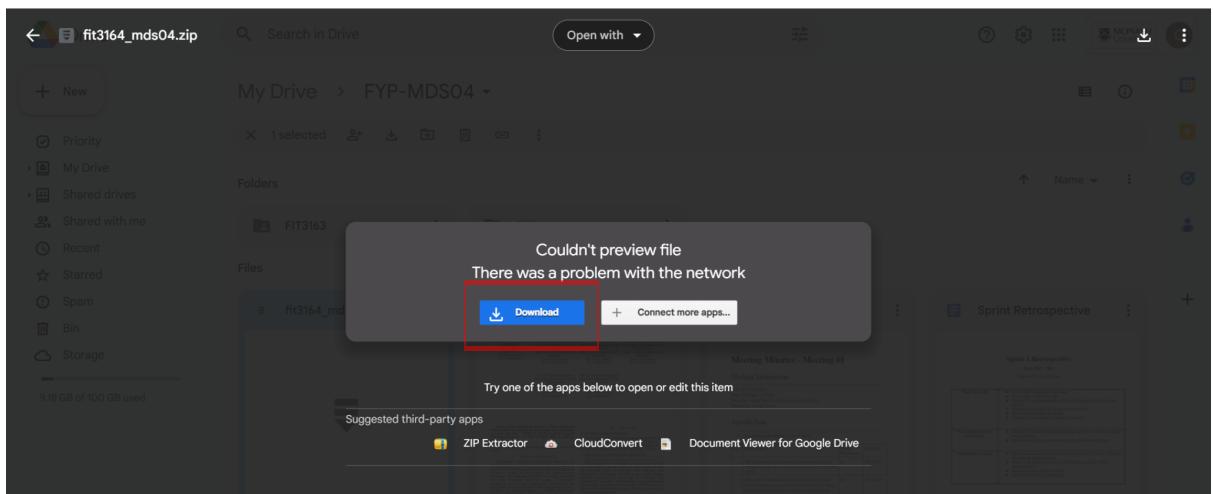


Fig 41. Download software folder

2. Unzip the software folder.

2.4 Launch Stock Market Forecasting Software

2.4.1 Windows User

1. Double click **windows_start_app.bat** file.

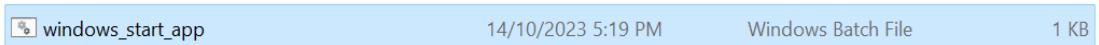


Fig 42. Window start app file

2. Enter the **PATH** where your **Python3.9** (or any other versions, but must be a 64-bit version) **is installed** (e.g. C:\Python39). Then, press Enter.

*Ensure sure all file directory names in the PATH do not contain spaces.

```
Please provide the path to your Python 3.9 installation directory (e.g., C:\Python39):  
Enter path: D:\Python39|
```

Fig 43. Python directory example

3. The window below will be shown in the terminal if the launching of software is successful.

*All required Python and Node libraries will be installed during first launch hence it requires a longer time.

```
Start dashboard...  
Start servers...  
  
> web-dashboard@0.1.0 dev  
> next dev  
  
> heroku-cra-node@1.0.0 start  
> node server  
  
Node dev server: listening on port 5000  
- ready started server on 0.0.0.0:3000, url: http://localhost:3000  
* Serving Flask app 'flask_server'  
* Debug mode: on  
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.  
* Running on all addresses (0.0.0.0)  
* Running on http://127.0.0.1:7000  
* Running on http://192.168.100.90:7000  
Press CTRL+C to quit
```

Fig 44. Terminal when launch is successful

4. Open <http://localhost:3000/> in the web browser.

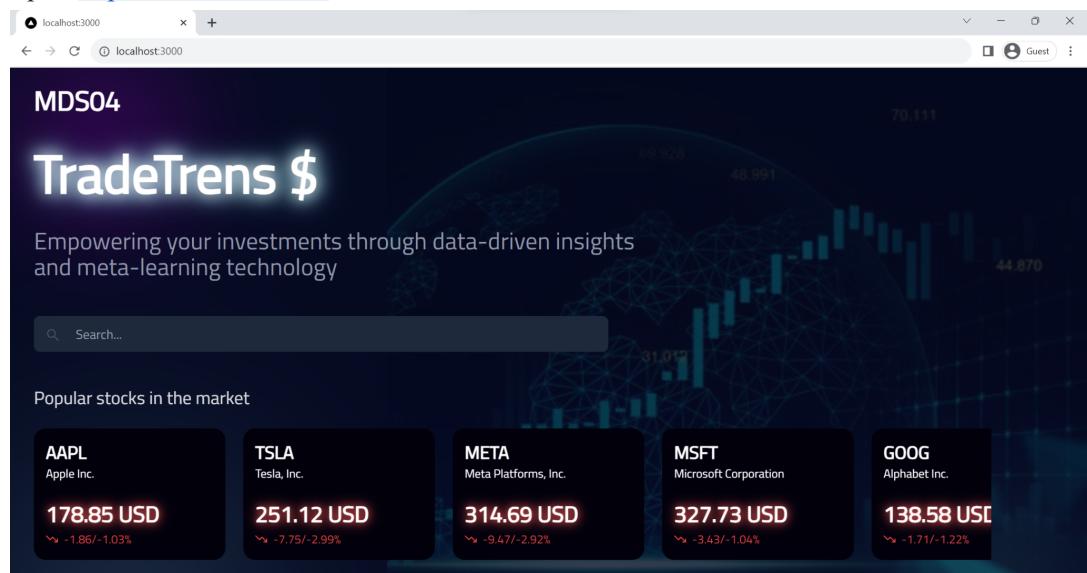


Fig 45. Web dashboard

2.4.2 MacOS User

1. Open Terminal and make sure ports 3000, 5000, and 7000 are not in use, if yes kill the processes in these ports.

2. Navigate to the software folder's directory `cd "Replace with software folder's directory"`

```
----  
[base] karenxia@Cool-MacBook-Air ~ % cd desktop/FIT3164-MDS04  
[base] karenxia@Cool-MacBook-Air FIT3164-MDS04 %
```

Fig 46. Change directory example

3. Run `chmod +x macos_start_app.sh macos_stop_app.sh`

```
(base) karenxia@Cool-MacBook-Air fit3164-mds04 % chmod +x macos_start_app.sh macos_stop_app.sh
```

Fig 47. Launch software using command 1

4. Run `sh macos_start_app.sh`

```
(base) karenxia@Cool-MacBook-Air fit3164-mds04 % sh macos_start_app.sh
```

Fig 48. Launch software using command 2

5. Enter the **PATH** where your **Python3.9** (or any other versions, , but must be a 64-bit version) **is installed** (e.g., /usr/local/bin/python3.9).

*Make sure all file directory names in the PATH do not contain spaces.

```
(base) karenxia@Cool-MacBook-Air fit3164-mds04 % sh macos_start_app.sh  
Please provide the path to your Python 3.9 installation directory (e.g., /usr/local/bin/python3.9):  
/karenxia/applications/python3.9
```

Fig 49. Python directory example

6. The window below will be shown in the terminal if the launching of software is successful.

*All required Python and Node libraries will be installed during first launch hence it requires a longer time.

```
(base) karenxia@Cool-MacBook-Air fit3164-mds04 %  
> web-dashboard@1.0.0 dev  
> next dev  
  
> heroku-cra-node@1.0.0 start  
> node server  
  
Node dev server: listening on port 5000  
- ready started server on 0.0.0.0:3000, url: http://localhost:3000  
* Serving Flask app 'flask_server'  
* Debug mode: on  
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.  
* Running on all addresses (0.0.0.0)  
* Running on http://127.0.0.1:7000  
* Running on http://192.168.0.189:7000  
Press CTRL+C to quit
```

Fig 50. Terminal when launch is successful

7. Open <http://localhost:3000/> in the web browser.

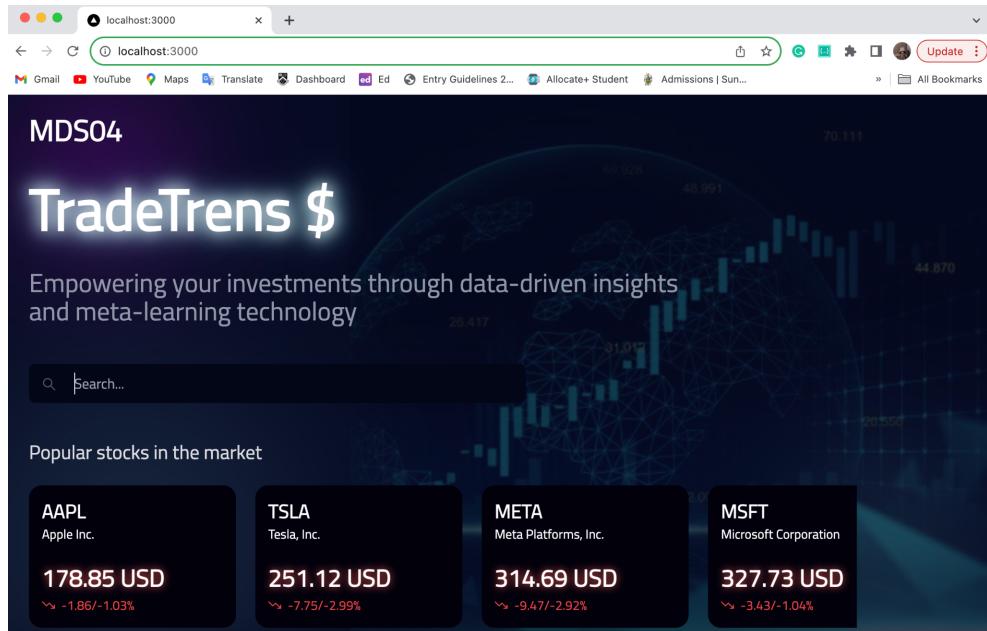


Fig 51. Web dashboard

2.5 Exit Stock Market Forecasting Software

2.5.1 Windows User

1. To exit the software, click the X button on the tab of <http://localhost:3000/>

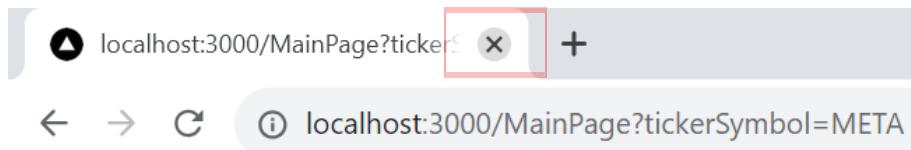


Fig 52. Close tab

2. Double click **windows_stop_app.bat** file.



Fig 53. Exit software 1

2.5.2 MacOs User

1. To exit the software, click the X button on the tab of <http://localhost:3000/>

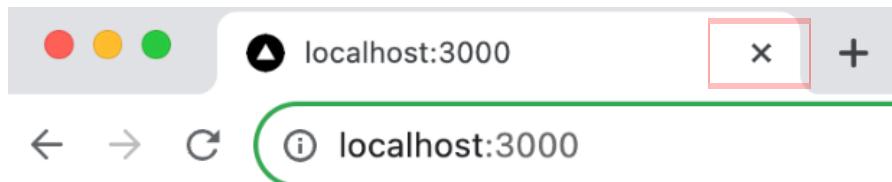


Fig 54. Close tab

2. Run `sh macos_stop_app.sh` in terminal

```
(base) karenxia@Cool-MacBook-Air fit3164-mds04 % sh macos_stop_app.sh
```

Fig 52. Exit software using command