LAB 2 : Report

Sarvesh Waghmare 018319262

GitHub : Link

The Stock Analyzer application *are* designed to manage a stock portfolio, retrieve historical stock datas, generate analytical report, create visual chart, and handle data import/export via CSV file. The applications architecture *were* composed of *an* following key files:

- **stock.py:**
    - Define the core data model for an application.
    - Stock:
        - Represent an individual stock, encapsulate attribute such as symbol, name,
        - share, and a chronological lists of daily_data.
    - DailyData:
        - Store specific daily stock metric, include date, closing_price, and volumes.
- **stock_data.py:**
    - Contain module responsible for data acquisitions and importation.
    - retrieve_stock_web:
        - Fetch historical stock data from Yahoo! Finance, leverage selenium
        - for browser automation and BeautifulSoup for HTML parse.
    - import_stock_web_csv:
        - Facilitate a import of stock data from a CSV file into Stock object.
- **stock_console.py:**
    - Implement the console-based user interface for a application.
- **stock_GUI.py:**
    - Implement a graphical user interface (GUI) use the tkinter librarys.

Dependencies

The application *rely* on several external *library*:

- **selenium**
    - and BeautifulSoup4 (bs4) for web scrape functionality.
- **matplotlib**
    - for generate chart.

- **tkinter**
    - for a GUI version (typically include with standard Python
    - distribution).
- **chromedriver**
    - (or a similar WebDriver for other browser) *are* required for selenium *too*
    - interface with an web browser.

Step-by-Step Walkthrough of Features

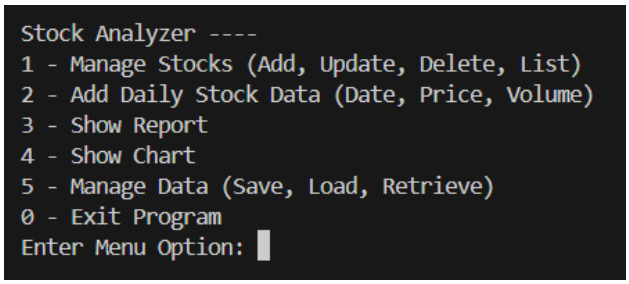
Feature 1: Manage Stocks

Allow users to add, update shares of, delete, and list stock in *they're* portfolio.

Console (stock_console.py)

Steps:

1. **Main Menu:**
    - display_main_menu *print* options; user *enter* 1 for "Manage Stocks".
    - Code: choice = self.display_main_menu() → if choice == "1": self.manage_stocks_menu().



2. **Manage Stocks Menu:**
    - manage_stocks_menu *present* option: Add (1), Update (2), Delete (3), List (4), Exit (0).
    - Example: User *enter* 1 (Add Stock).
    - Code: if choice == "1": self.add_stock().
3. **Add Stock:**
    - add_stock *prompt* for ticker, name, shares (e.g., AAPL,GOOG).
    - A Stock object *are* created and *append* to self.stock_list.
    - Code: stock = Stock(symbol, name, shares); self.stock_list.append(stock).
    - *Prompt* to add another or exits.

```
Manage Stocks ----
1 - Add Stock
2 - Update Shares
3 - Delete Stock
4 - List Stocks
0 - Exit Manage Stocks
Enter Menu Option: 1

Add Stock ----
Enter Ticker Symbol: APPL
Enter Company Name: Apple
Enter Number of Shares: 120
Stock Added - Enter to Add Another Stock or 0 to Stop: 0
```

4. **Update Shares:**
    - User *select* 2 → update_shares_menu (Buy (1), Sell (2), Exit (0)).
    - Buy Shares (buy_shares): Show stock list; *prompt* for symbol, shares (e.g., AAPL, 50). *Update* stock.shares += shares.
    - Sell Shares (sell_shares): Similar to buy, but *validate* against owned share (e.g., AAPL, 30). *Update* stock.shares -= shares.

```
Update Shares ----
1 - Buy Shares
2 - Sell Shares
0 - Exit Update Shares
Enter Menu Option: 2

Sell Shares ----
Stock List: ['AAPL']
Which stock do you want to sell?: AAPL
How many shares do you want to sell?: 60
Updated shares for AAPL: 60.0
```

5. **Delete Stock:**
    - User *selects* 3 → delete_stock. *Prompts* for symbol (e.g., AAPL). *Remove* stock from self.stock_list.
    - Code: self.stock_list.pop(i).

```
Manage Stocks ----
1 - Add Stock
2 - Update Shares
3 - Delete Stock
4 - List Stocks
0 - Exit Manage Stocks
Enter Menu Option: 3

Delete Stock ----
Stock List: ['AAPL', 'GOOG']
Which stock do you want to delete?: GOOG
Stock GOOG deleted.
```

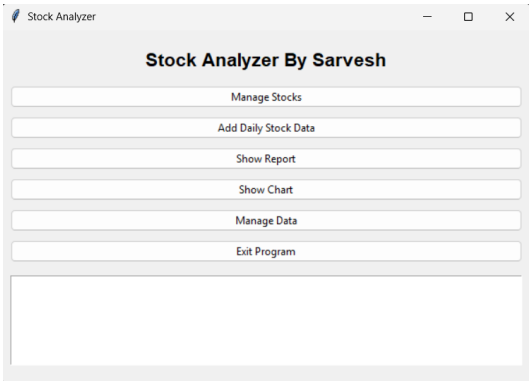
6. **List Stocks:**
    - User *selects* 4 → list_stocks. *Print* a formatted table: SYMBOL NAME SHARES.
    - Example Output: AAPL APPLE 120.

```
Manage Stocks ----
1 - Add Stock
2 - Update Shares
3 - Delete Stock
4 - List Stocks
0 - Exit Manage Stocks
Enter Menu Option: 4

Stock List ----
SYMBOL  NAME            SHARES
AAPL    APPLE           60.0
Press Enter to Continue ***
```

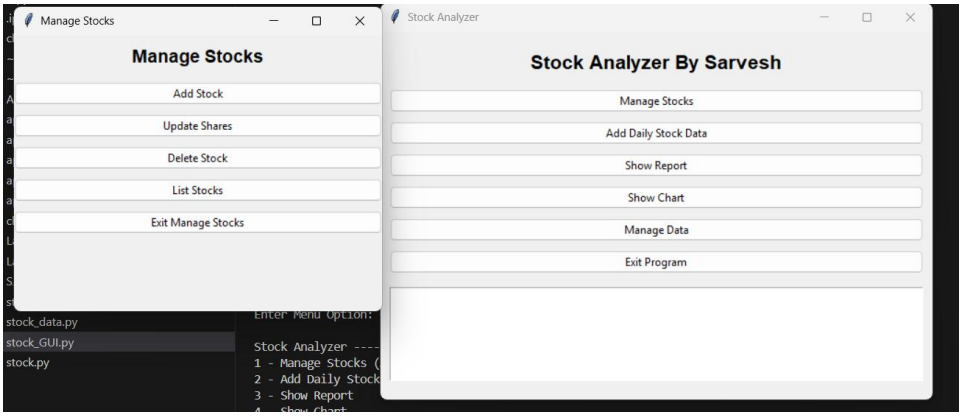
GUI (stock_GUI.py)

Steps:

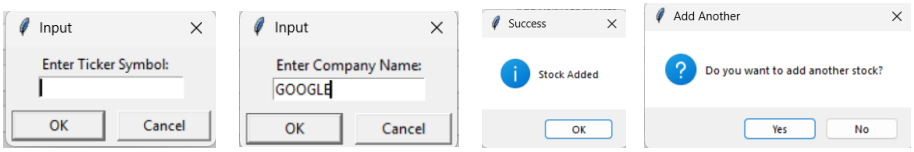
1. **Main Window: User *click* the "Manage Stocks" button.**
    - Code: ttk.Button(..., command=self.manage_stocks_menu) *call* manage_stocks_menu.



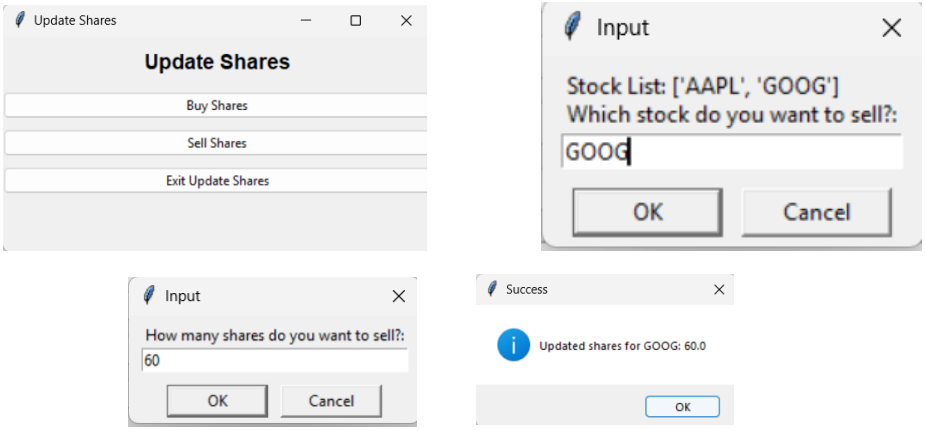
2. **Manage Stocks Window:**
    - manage_stocks_menu *open* a Toplevel window with buttons: Add Stock, Update Shares, Delete Stock, List Stocks, Exit.
    - User *click* "Add Stock".
    - Code: ttk.Button(..., command=lambda: [manage_window.destroy(), self.add_stock()]).



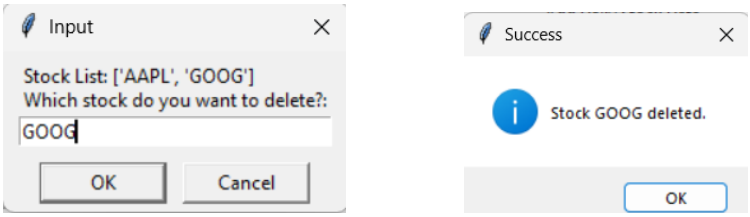
3. **Add Stock:**
    - add_stock *use* simpledialog to get ticker, name, shares (e.g., AAPL, APPLE, 100).
    - *Create* Stock object, *add* to self.stock_list. (Code: stock = Stock(symbol, name, shares)).
    - *Show* success message; messagebox.askyesno("Add Another", ...) to add more.



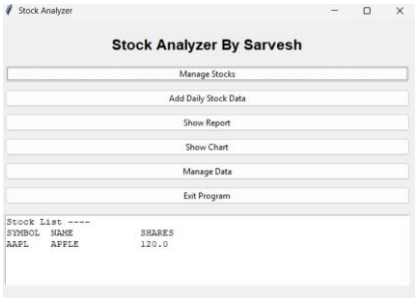
4. **Update Shares:**
    - User *clicks* "Update Shares" → update_shares_menu *open* a new window.
    - Buy Shares (buy_shares): Dialogs *prompt* for symbol, shares (e.g., AAPL, 50). *Updates* shares, *show* success.
    - Sell Shares (sell_shares): Similar, with *validations*. *Update* shares (e.g., AAPL, 30).



5. **Delete Stock:**
    - User *clicks* "Delete Stock" → delete_stock. Dialog *prompt* for symbol. *Removes* stock, *show* success.



6. **List Stocks:**
    - User *clicks* "List Stocks" → list_stocks. *Display* the stock list in the main *window* Text widget.
    - Code: self.display_output(output) with formatted *tables*.



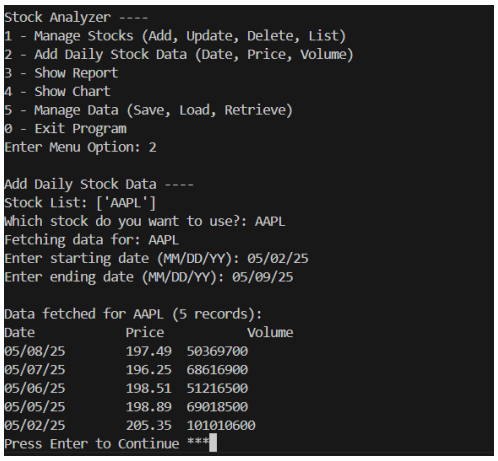
Feature 2: Add Daily Stock Data

Fetch historical stock data from Yahoo! Finance for a specific stock within a date *ranges*.

Console

Steps:

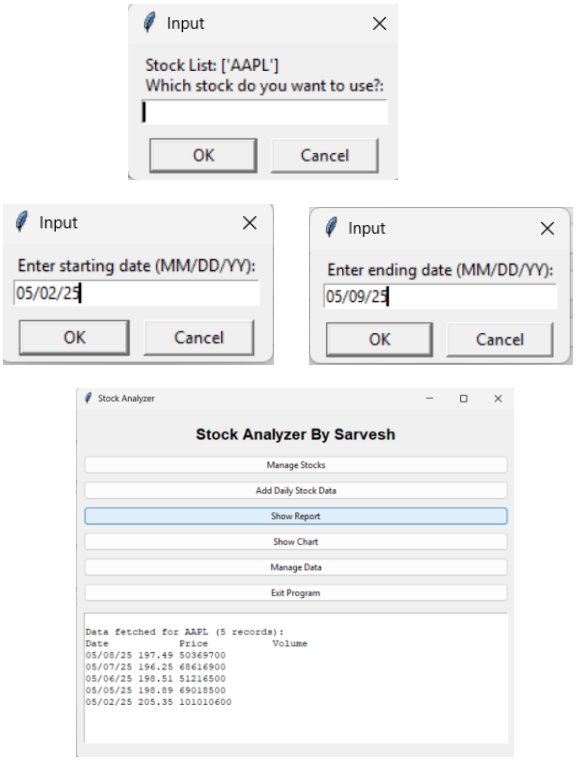
1. **Main Menu** → User *enter* 2 → add_daily_stock_data.
2. ***Prompts* for stock symbol, start date, end date** (e.g., AAPL, 05/02/25, 05/09/25).
3. *Call* stock_data.retrieve_stock_web(dateFrom, dateTo, [stock]) to fetch data.
4. *Displays* fetched data in a table format: Date Price Volume.
    - Example Output: 05/08/25 197.49 50369700.



GUI

Steps:

1. **Main Window** → User *clicks* "Add Daily Stock Data" button → add_daily_stock_data.
2. **Dialog *box* prompt for symbol, start date, end date** (e.g., AAPL, 05/02/25, 05/09/25).
3. *Fetch* data using stock_data.retrieve_stock_web.
4. *Display* the data in the main Text widget via self.display_output(output).



Feature 3: Show Report

Generate and *display* a report of all stocks in the portfolio and *they're* daily historical data.

Console

Steps:

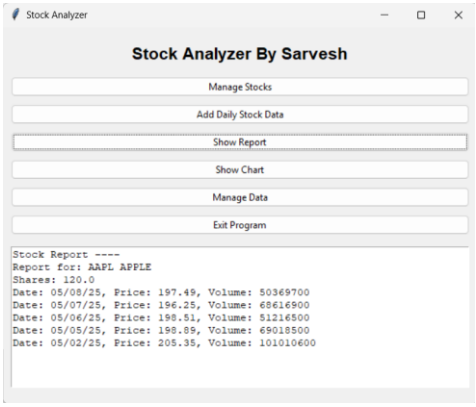
1. **Main Menu** → User *enters* 3 → show_report.
2. *Loop* through self.stock_list, printing detail for each stock *include* share count and daily data.
    - Example Output:
    - Report for: AAPL APPLE
    - Shares: 120
    - Date: 05/08/25 197.49 50369700.

```
Stock Analyzer ----
1 - Manage Stocks (Add, Update, Delete, List)
2 - Add Daily Stock Data (Date, Price, Volume)
3 - Show Report
4 - Show Chart
5 - Manage Data (Save, Load, Retrieve)
0 - Exit Program
Enter Menu Option: 3

Stock Report ----
Report for: AAPL APPLE
Shares: 60.0
Date: 05/08/25, Price: 197.49, Volume: 50369700
Date: 05/07/25, Price: 196.25, Volume: 68616900
Date: 05/06/25, Price: 198.51, Volume: 51216500
Date: 05/05/25, Price: 198.89, Volume: 69018500
Date: 05/02/25, Price: 205.35, Volume: 101010600
---- Report Complete ----
Press Enter to Continue
```

GUI

Steps:

1. **Main Window** → User *click* "Show Report" button → show_report.
2. *Execute* the same underlying logic as a console version but *direct* the formatted output to the Text widget *use* self.display_output(output).



Feature 4: Show Chart

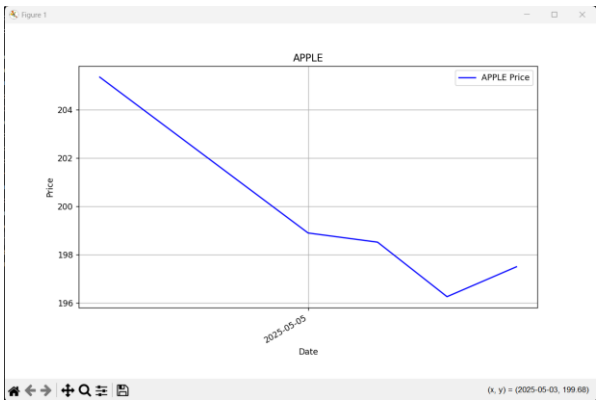
Generate a price chart for a selected stock *use* matplotlib.

Console

Steps:

1. **Main Menu** → User *enter* 4 → show_chart.
2. ***Prompts* for stock symbol** (e.g., AAPL).
3. ***Parse* dates and prices** from stock.daily_data and *use* matplotlib to create a plot.
    - Code: plt.plot(dates, prices, 'b-', label=f"{stock.name} Price").
4. ***Display* the chart** in a new matplotlib window and typically *save* it as an image file (e.g., PNG).

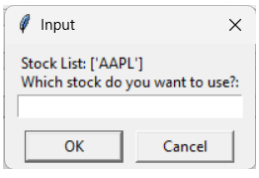
```
Stock Analyzer ----
1 - Manage Stocks (Add, Update, Delete, List)
2 - Add Daily Stock Data (Date, Price, Volume)
3 - Show Report
4 - Show Chart
5 - Manage Data (Save, Load, Retrieve)
0 - Exit Program
Enter Menu Option: 4

Show Chart ----
Stock List: ['AAPL']
Which stock do you want to use?: AAPL
```

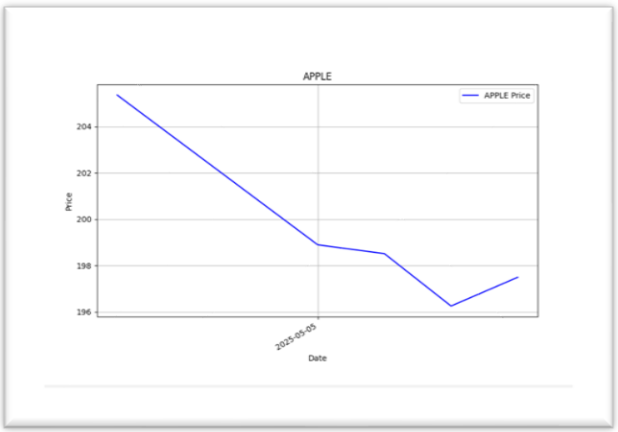


GUI

Steps:

1. **Main Window** → User *click* "Show Chart" button → show_chart.
2. **A dialog box *prompt* for the stock symbol** (e.g., AAPL).
3. *Utilize* the same matplotlib plotting logic as the console version, *display* the chart in *a new windows*.





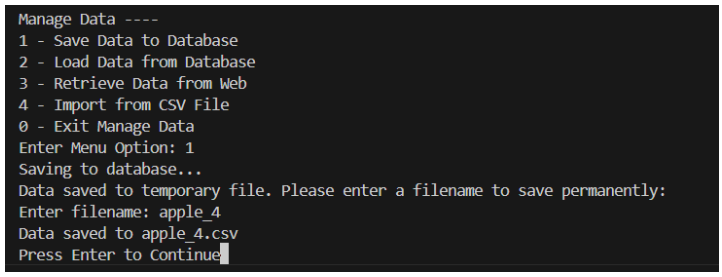
Feature 5: Manage Data

Handle data operations such as saving to/loading from CSV, retrieving data from *a* web, and importing from *a* CSV file.

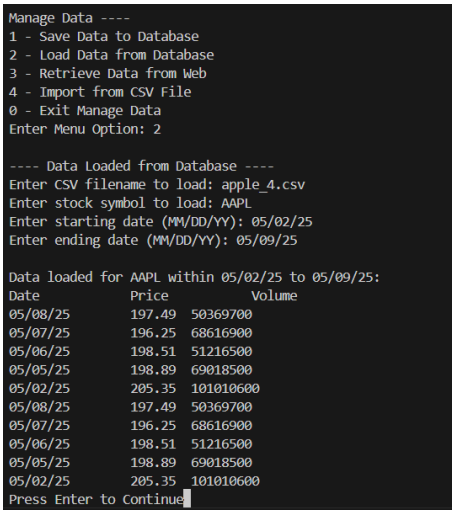
Console

Steps:

1. **Main Menu** → User *enters* 5 → manage_data_menu.
2. ***Present* submenu: Save (1), Load (2), Retrieve (3), Import (4), Exit (0).**
3. **Save Data to Database (save_to_database):**
    - Typically *fetch* current data for all stocks *use* retrieve_stock_web.
    - *Saves* data to a CSV file, prompting *an* user for a filename (e.g., apple_4.csv).



4. **Load Data from Database (load_from_database):**
    - *Prompts* for filename, symbol, start/end dates (e.g., apple_4.csv, AAPL, 05/02/25, 05/09/25).
    - *Load* and *display* the filtered data.



5. **Retrieve Data from Web (retrieve_from_web):**
    - *Prompts* for start/end dates (e.g., 05/02/25, 05/09/25).
    - *Fetch* data for all stocks in *an* portfolio and *report* the number of records retrieved (e.g., Records Retrieved: 5).

```
Manage Data ----
1 - Save Data to Database
2 - Load Data from Database
3 - Retrieve Data from Web
4 - Import from CSV File
0 - Exit Manage Data
Enter Menu Option: 3

Retrieving Stock Data from Yahoo! Finance ----
This will retrieve data from all stocks in your stock list.
Enter starting date (MM/DD/YY): 05/02/25
Enter ending date (MM/DD/YY): 05/09/25
Records Retrieved: 5
Press Enter to Continue
```

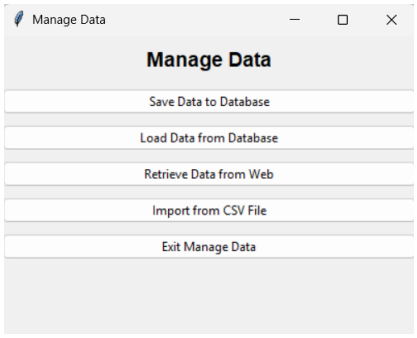
6. **Import from CSV File (import_csv):**
    - *Prompts* for filename and symbol (e.g., apple_4.csv, AAPL).
    - *Import* data from *a* specified CSV and *display* it or a confirmation messages.

```
Manage Data ----
1 - Save Data to Database
2 - Load Data from Database
3 - Retrieve Data from Web
4 - Import from CSV File
0 - Exit Manage Data
Enter Menu Option: 4

Import CSV file from Yahoo! Finance ----
Stock List: ['AAPL']
Which stock do you want to use?: AAPL
Enter filename: apple_1.csv
CSV Header: ['Symbol', 'Date', 'Price', 'Volume']
Imported (custom format): ['AAPL', '05/08/25', '197.49', '50478900']
Imported (custom format): ['AAPL', '05/07/25', '196.25', '68616900']
Imported (custom format): ['AAPL', '05/06/25', '198.51', '51216500']
Imported (custom format): ['AAPL', '05/05/25', '198.89', '69018500']
Imported (custom format): ['AAPL', '05/02/25', '205.35', '101010600']
Imported (custom format): ['AAPL', '05/09/25', '198.53', '33161940']
Imported (custom format): ['AAPL', '05/08/25', '197.49', '50478900']
Imported (custom format): ['AAPL', '05/07/25', '196.25', '68616900']
Imported (custom format): ['AAPL', '05/06/25', '198.51', '51216500']
Imported (custom format): ['AAPL', '05/05/25', '198.89', '69018500']
Imported (custom format): ['AAPL', '05/02/25', '205.35', '101010600']
Imported (custom format): ['AAPL', '05/01/25', '213.32', '57365700']
```

GUI

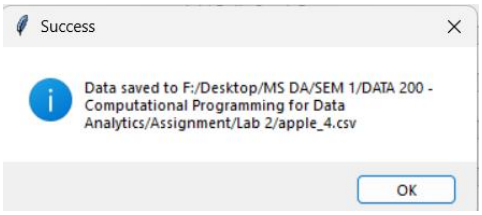
Steps:

1. **Main Window** → User *clicks* "Manage Data" button → manage_data_menu.
2. ***Open* a new window with buttons: Save, Load, Retrieve, Import, Exit.**



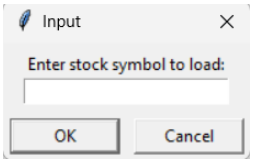
3. **Save Data to Database:**

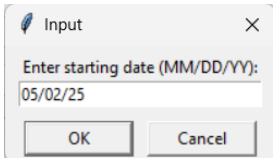
- *Fetches* data, then *open* a standard file save dialog (filedialog.asksaveasfilename(...)) for *an* user to specify *a* filename and location (e.g., apple_4.csv).

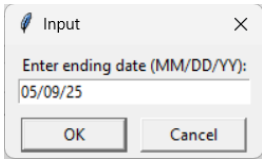


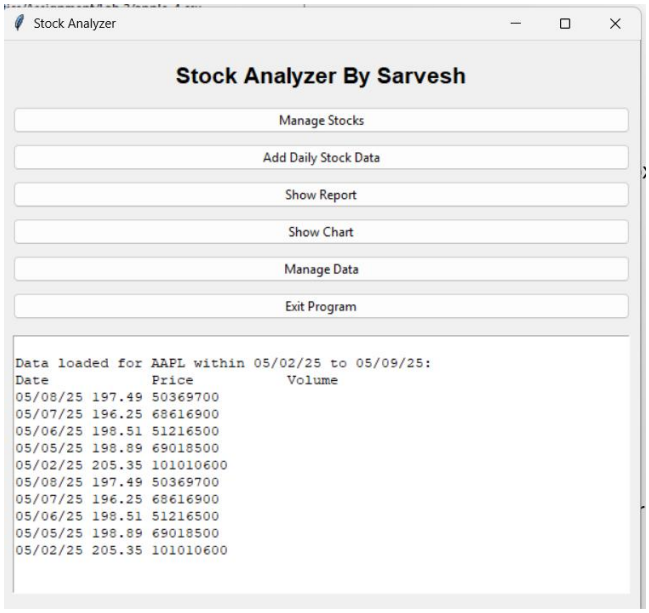
4. **Load Data from Database:**

- *Use* a file open dialog for *select* the CSV file, followed *by* dialog boxes for symbol and date range input.
- *Displays* loaded data in *a* Text widget.



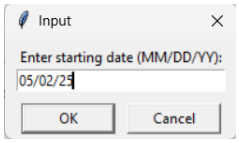


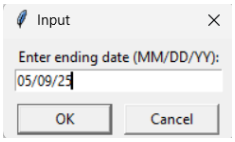


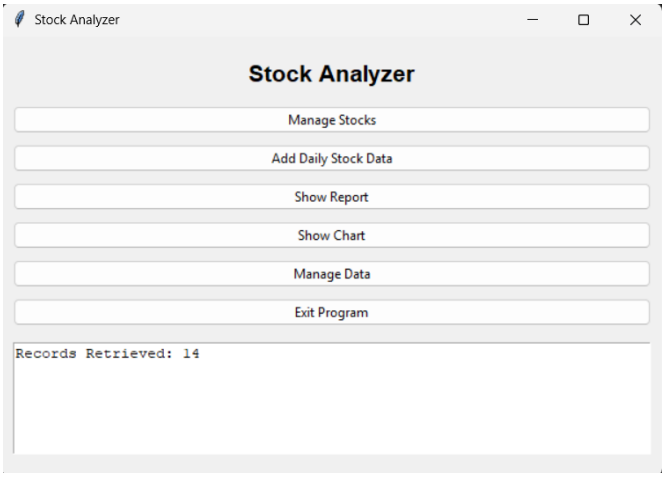


5. **Retrieve Data from Web:**

- *Use* dialog boxes to get start/end dates, *fetch* data, and *show* the record count, typically in a message *boxs*.







6. **Import from CSV File:**

   - *Use* a file open dialog for CSV selection, a dialog for *a* stock symbol, and then *display* imported data or a confirmation in *a* Text widget or a message box.