FINAL PROJECT REPORT

STOCK ANALYSIS APPLICATION

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**FINAL PROJECT REPORT**

1. **Project description:**

This is a stock analysis program that analyze stock data (open value) in 3 years (2016-2018) using API from:

<https://www.alphavantage.co/query?function=TIME_SERIES_WEEKLY&symbol=aapl&apikey=AJXWVVW0CXFUR23F>

The program allows registered user to retrieve or predict price on certain date. The program also allows user to visualize the graph of each month/year and all of 3 years.

Each registered credential will be stored in database and is provided a random-generated pair of PIN and Access Code. Exception: Admin account is default with a pair of PIN: 0000 and Access code: 0000. To comply with high security layer, PIN is required to log in and Access Code is required for data analysis.

Sample credentials which has been created:

|  |  |  |  |
| --- | --- | --- | --- |
| Username | Password | PIN | Access Code |
| admin | admin | 0000 | 0000 |
| mnguye13 | 1234 | 1018 | 97276 |
| bill97 | 2311 | 1005 | 16955 |

1. **Folders and Files:**

img (Folder): Folder to save graph images

randomCode.py: Python file for generating pairs of random PIN and Access Code

AccountStorage.py: Python file for account & credential database CRUD

Pytest.py: Main Python file for stock analysis program

Users.dat: Dat file of random-generated random PIN and Access Code

Accounts.db: Database for user accounts

1. **Program Output:**

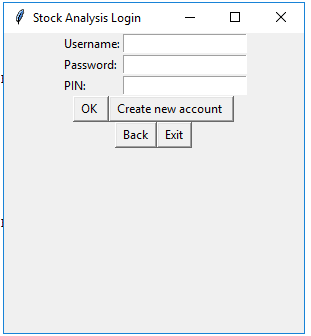
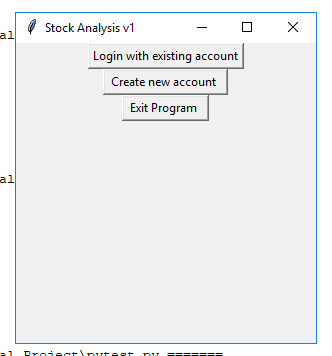


Figure 1: Main Menu Frame Figure 2: Login Frame

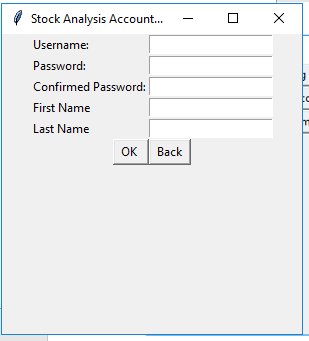
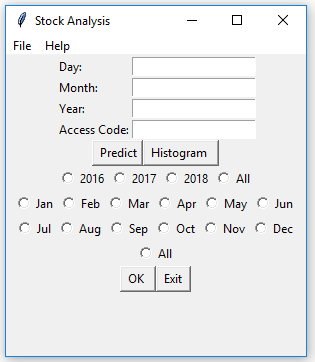
 

Figure 3: Account Registration Frame Figure 4: Main Analysis Frame

1. **General Objective:**
2. ***Create a menu option to allow user choices to enter dates for a variety of predictive outcomes. Ex. allow date entries an entry by day, month,year. Demonstrate at least 2 date outcomes that differ in time (ex. month vs year).***

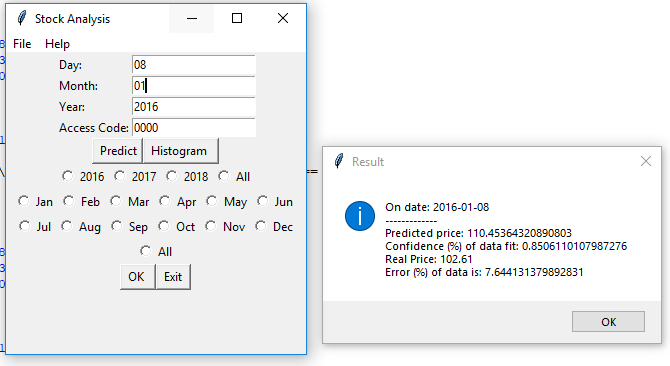


Figure 5: Predicted vs real prices on 2016-01-08

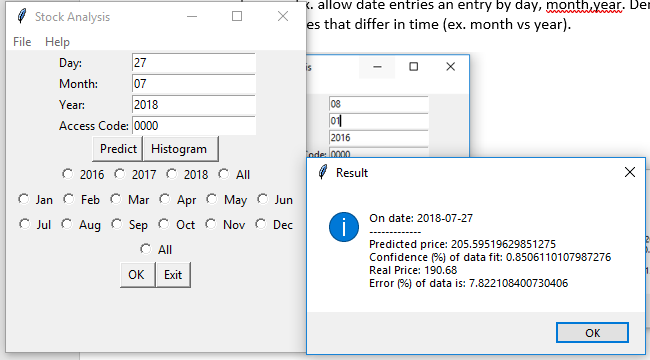


Figure 6: Predicted vs real prices on 2018-07-27

Notes: Since real prices are the prices that are collected from actual data on certain dates, prices on other dates are predicted only.

1. ***Chart details. Show at least two ‘scatter’ charts detailing your data. Ex. chart 1 can show price by a given year(s) and chart 2 can display monthly charted data.***

***Create a histogram (bar chart) showing the frequency distribution of data. Bar stock prices. Good idea may be to have your data sorted by date for example.***

***X plots will be dates, Y plots will show corresponding price points. Label your charts accordingly.***

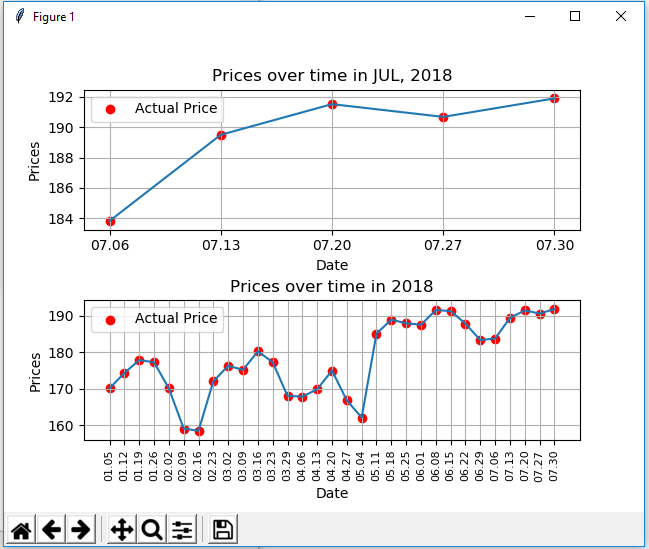


Figure 6: Prices over time graph. Prices over July 2018 graph and Prices over whole 2018 graph

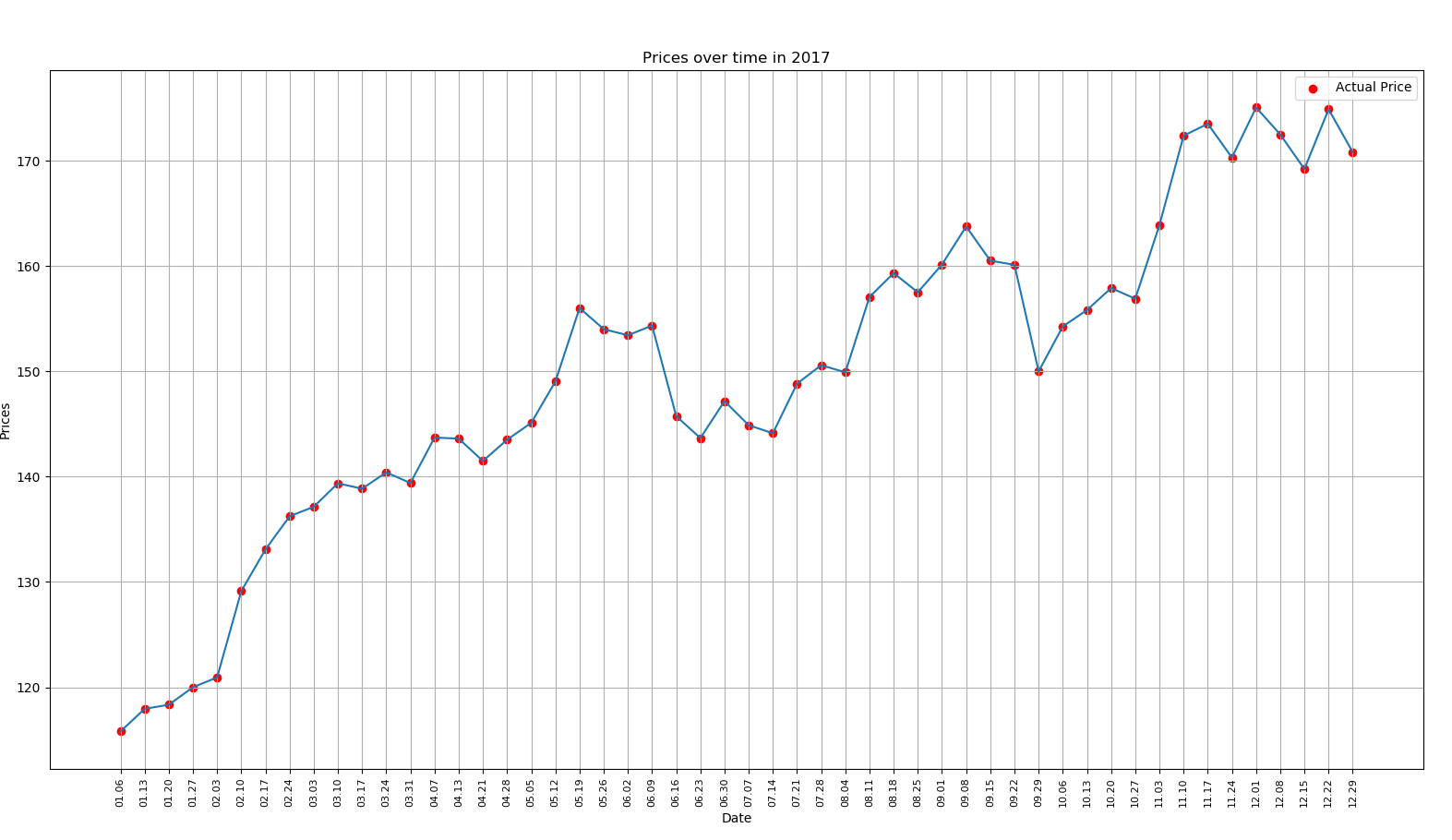


Figure 6: Prices over whole 2017 graph

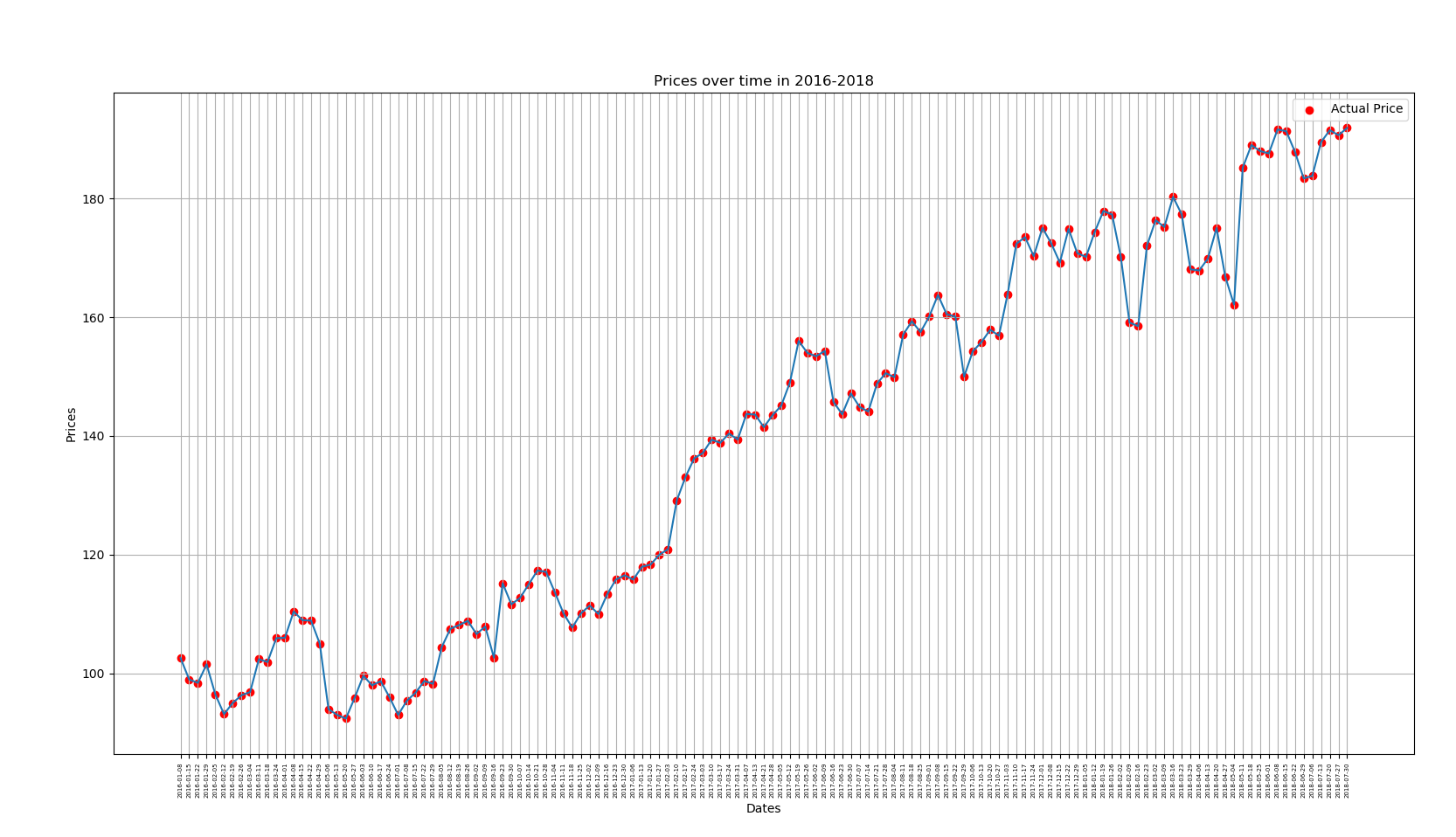


Figure 6: Prices over 3 years from 2016-2018 graph

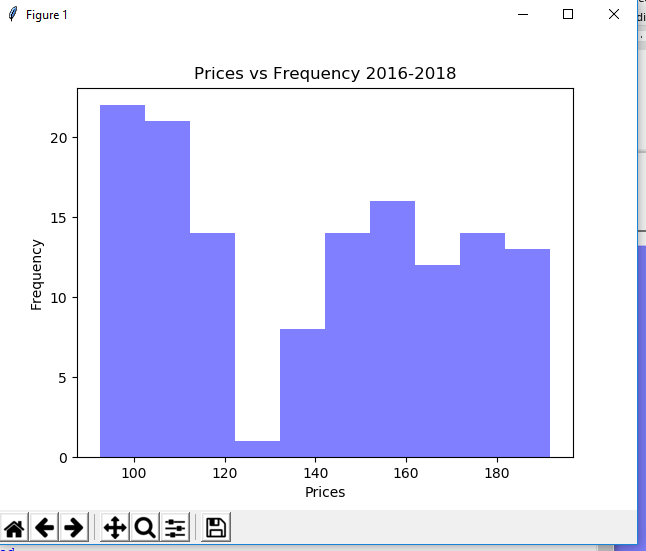


Figure 7: Prices vs Frequency in 3 years (2016-2018) graph

1. ***Present the following summary stats in your console.***
2. ***Median of some data points. Ex. Median of opening prices.***
3. ***Highest value amongst data points. Ex. Highest price / corresponding date.***
4. ***Lowest price value amongst data points. Ex. Lowest price / corresponding date.***

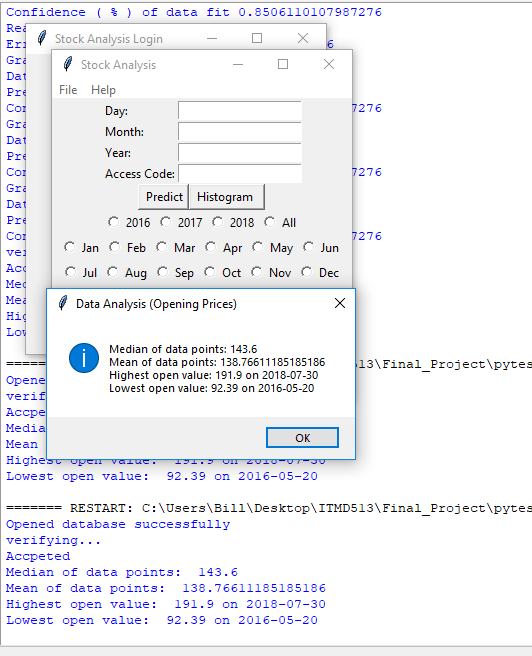


Figure 7: Data analysis for opening prices.

1. **GRAD Objectives:**

***Create a GUI login / menu driven system***

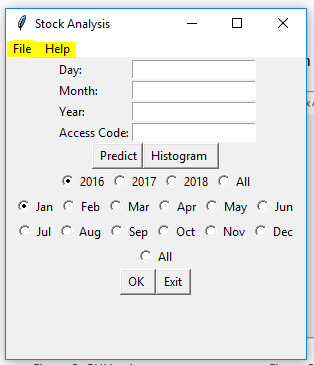
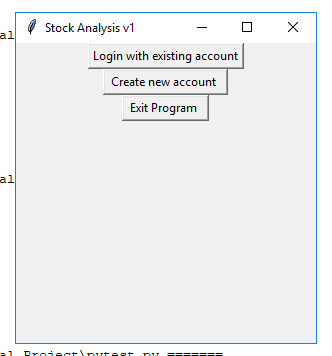
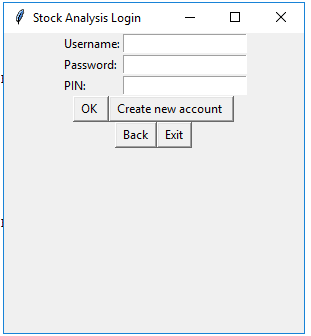


Figure 8: GUI Login Figure 9: Menu Driven 1 Figure 10: Menu Driven 2

***Create access codes for users in a separate file called users.dat. Include a list of tuples consisting of randomized access codes in the form of (access code, pin number).***

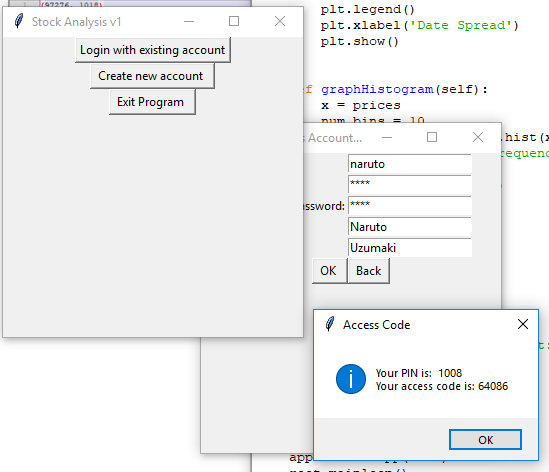
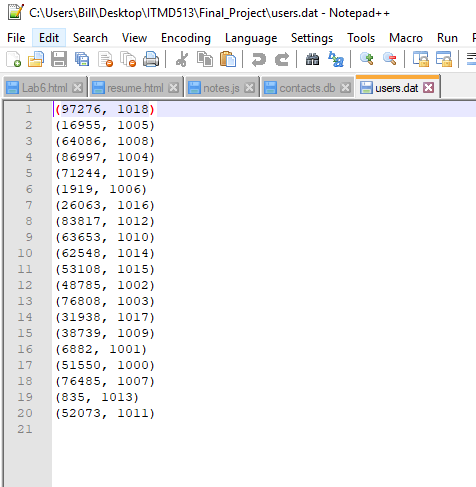


Figure 11: Pairs of random-generated access code & PIN

Figure 12: Pairs of random-generated access code & PIN provided to new user

1. **Extra Credit**

***Include multiplot graphs (ex. scatter plot by year, scatter plot by month) as one image***

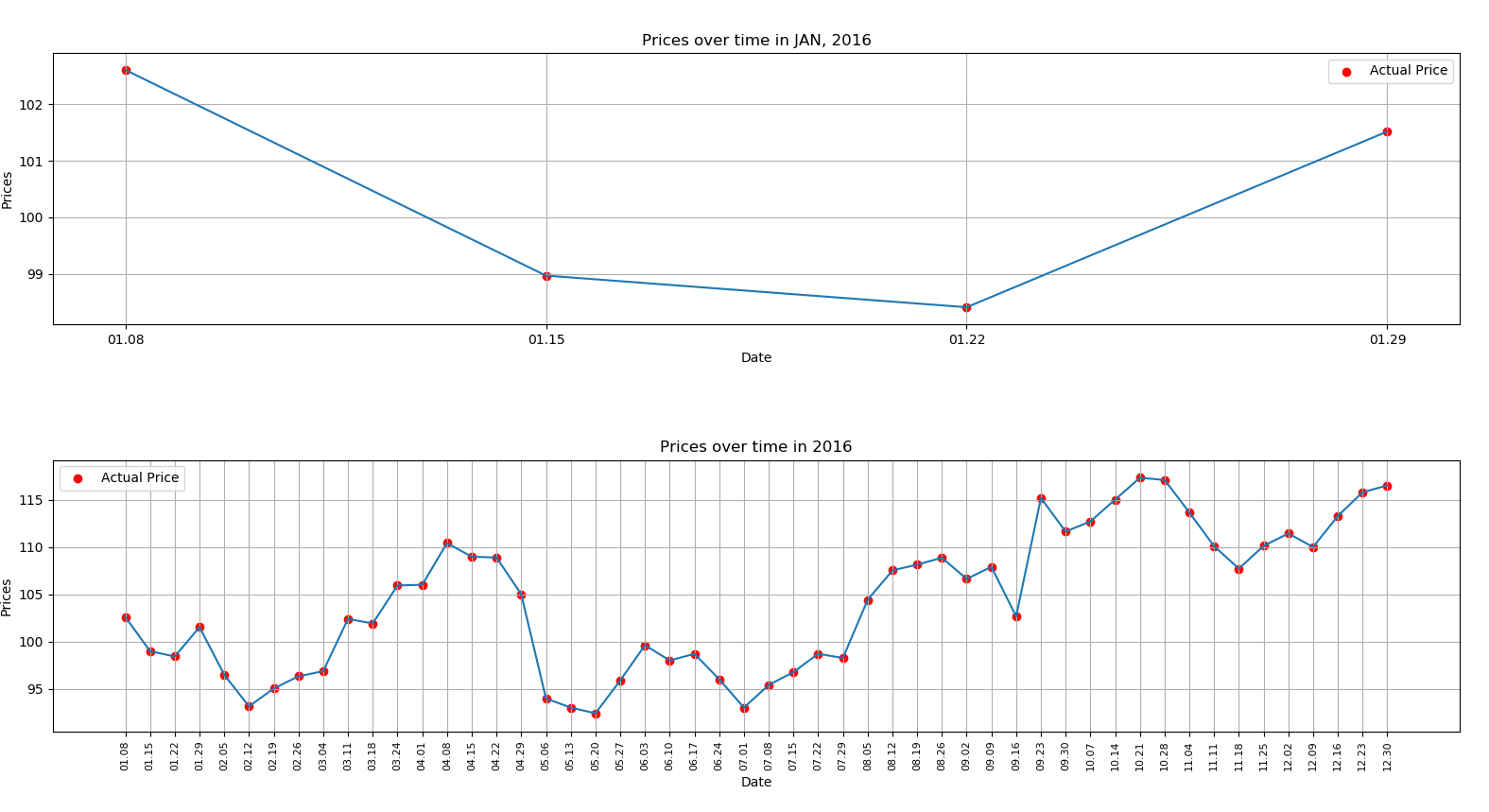


Figure 11: 2 subplots 1 plot

***Database (sqlite3, etc.) of dataset***

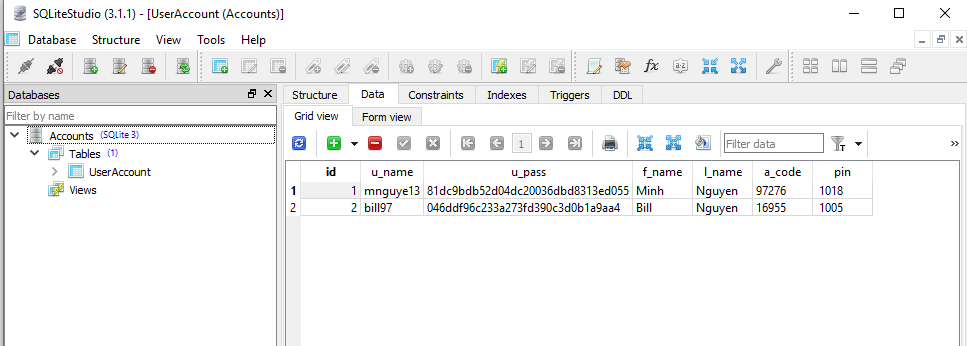


Figure 12: User Account database



Figure 13: Insert queries to insert new user to the database



Figure 14: Load user from database to the program for processing (using ‘SELECT \* FROM …’ query)

***Password hashing***





Figure 14: Hash password then store in user database

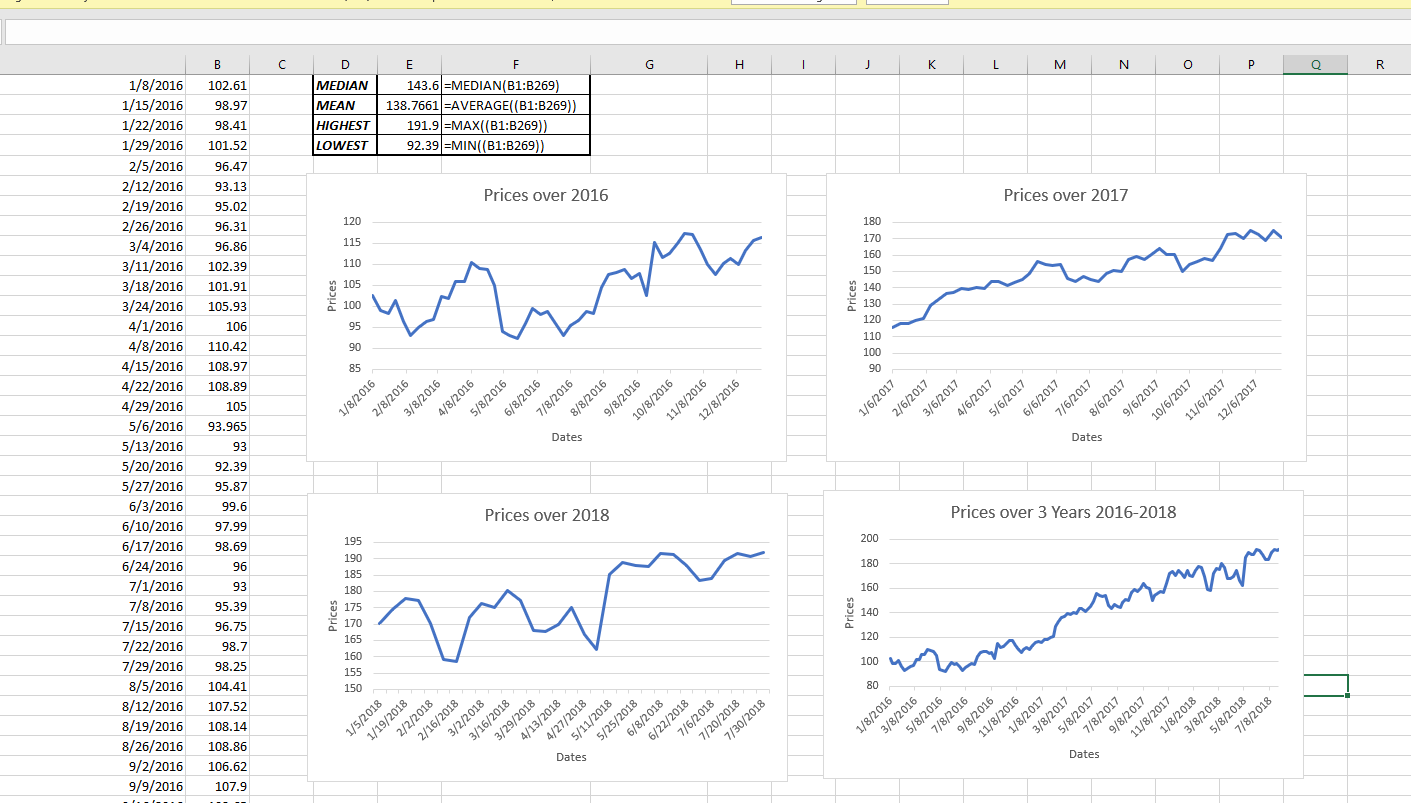
1. **Extra Notes:**

Please enter date by correct format DD/MM/YYYY

The program also has various error traps to prevent unexpected bugs and various credential checking mechanism to enhance security and performance.

Example: existed username checking, double password checking, data retrieve error traps, save to csv error traps, …

Excel Output:



1. **References:**

<https://www.alphavantage.co/query?function=TIME_SERIES_WEEKLY&symbol=aapl&apikey=AJXWVVW0CXFUR23F>

Demo video:

<https://drive.google.com/file/d/1WlqFscJqYVGomNPpJenyRwjiSNMNDZ_3/view?usp=sharing>