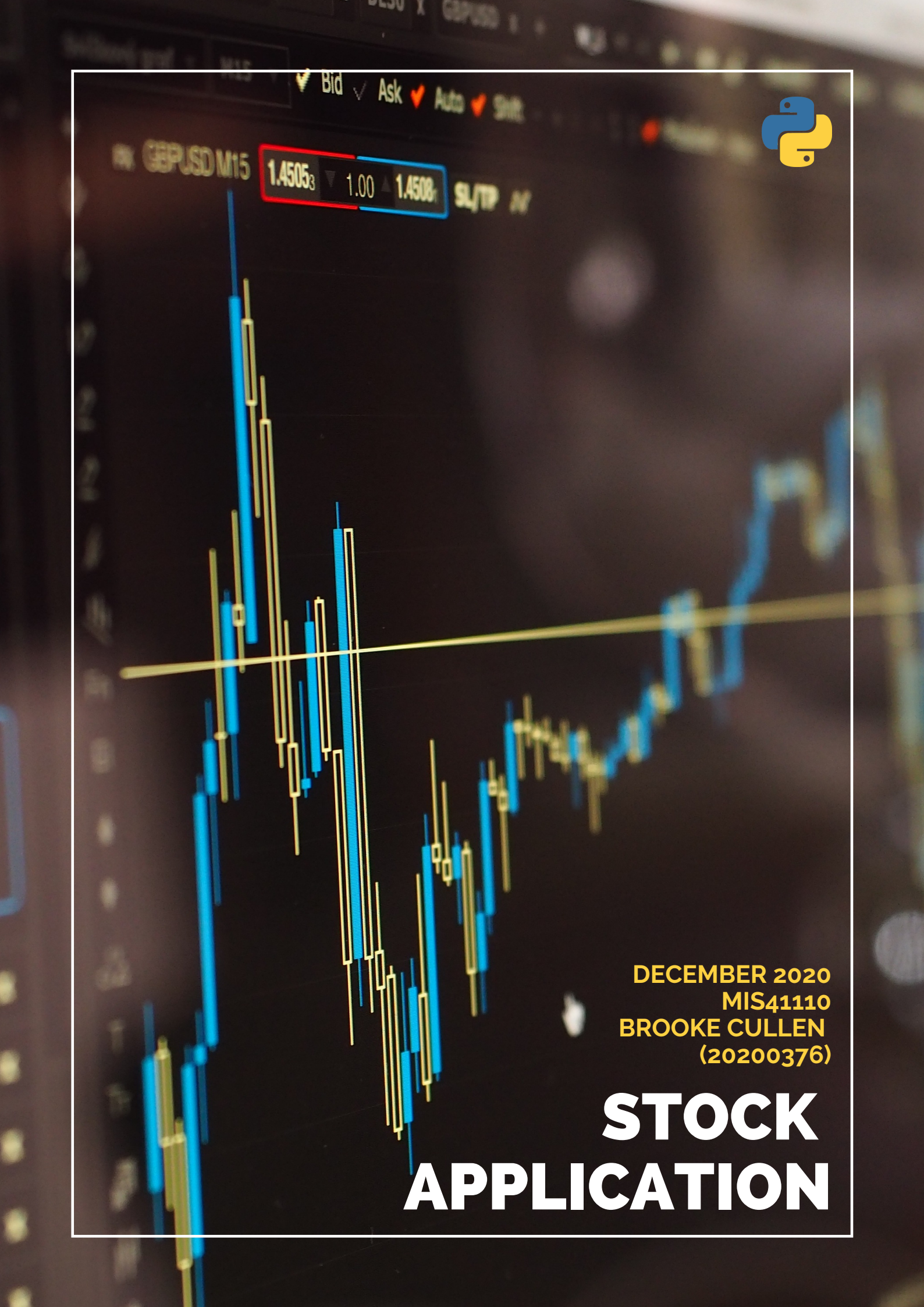


DECEMBER 2020
MIS41110
BROOKE CULLEN
(20200376)

STOCK APPLICATION

TABLE OF CONTENTS

GETTING STARTED

PIP INSTALL

yfinance

tkhtmlview

FILES NEEDED

stock.py

message.py

inputs.py

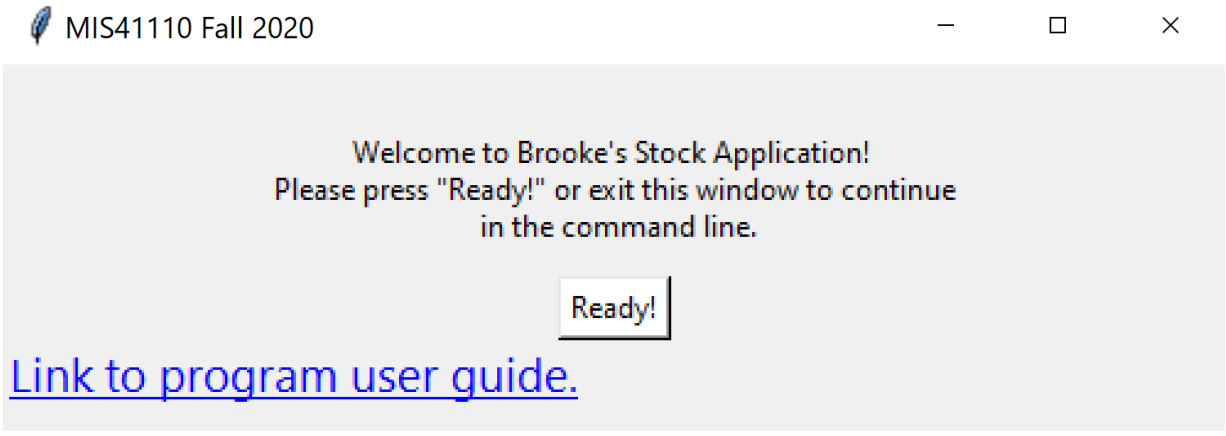
arima.py

descriptivegraphs.py

predict.py

RUN STOCK.PY

RUNNING THE PROGRAM



Must press "Ready!" or exit pop up window to continue

MAIN MENU

```
Main Menu:
1. Historical Data & Summary Statistics
2. Graphical Displays
3. Predict Closing Price (Linear Regression)
4. Export Stock Data to .CSV
5. Quit Program


Please choose a menu option:
```

1. HISTORICAL DATA & SUMMARY STATISTICS

```
Please choose a menu option: 1

Enter Ticker Symbol: googl

Enter Start Date (YYYY-MM-DD): 2020-05-05

Enter End Date (YYYY-MM-DD): 2020-10-10
```

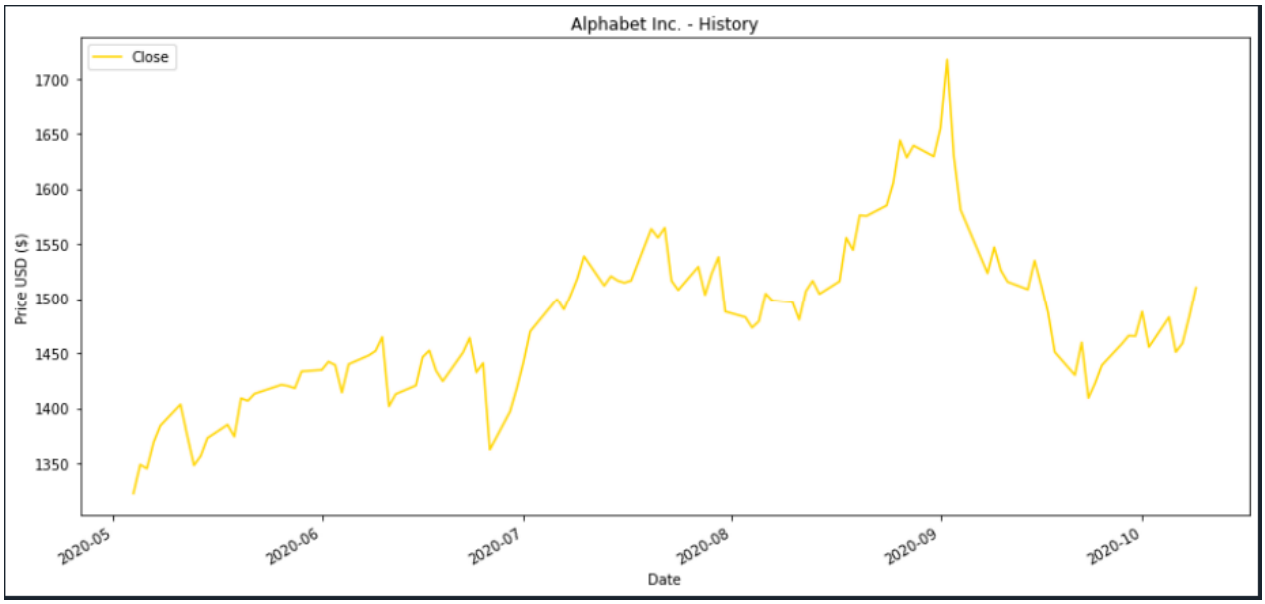
```
 Alphabet Inc.
Ticker = GOOGL
Start Date = 2020-05-05
End Date = 2020-10-10

STOCK INFORMATION:
                Open     High      Low    Close  Adj Close   Volume
Date
2020-05-04  1308.13  1324.47  1296.01  1322.90    1322.90  1540300
2020-05-05  1337.50  1371.01  1335.03  1349.02    1349.02  1983300
2020-05-06  1358.00  1368.69  1345.13  1345.43    1345.43  1586600
2020-05-07  1361.31  1376.00  1352.54  1369.28    1369.28  1532600
2020-05-08  1381.82  1396.64  1372.01  1384.34    1384.34  1666300
...             ...      ...      ...      ...         ...      ...
2020-10-05  1462.65  1484.70  1460.09  1482.83    1482.83  1080100
2020-10-06  1475.50  1484.52  1445.01  1451.02    1451.02  1304800
2020-10-07  1459.31  1468.97  1433.23  1459.14    1459.14  1805400
2020-10-08  1465.45  1488.03  1465.45  1483.43    1483.43  1303800
2020-10-09  1492.86  1511.85  1487.00  1510.45    1510.45  1648300

[112 rows x 6 columns]

SUMMARY STATISTICS:
            Open     High      Low    Close  Adj Close      Volume
count     112.00   112.00   112.00   112.00     112.00      112.00
mean     1477.48  1495.46  1460.45  1479.10    1479.10  1773085.71
std        74.78    75.48    72.53    73.97      73.97   606560.99
min      1308.13  1324.47  1296.01  1322.90    1322.90   999500.00
25%      1426.18  1444.09  1407.67  1428.77    1428.77  1425125.00
50%      1475.83  1489.26  1457.92  1476.20    1476.20  1640050.00
75%      1516.20  1537.85  1502.78  1516.86    1516.86  1987575.00
max      1699.52  1726.10  1660.19  1717.39    1717.39  4882000.00
```

2. GRAPHICAL DISPLAY MENU

```
Please choose a menu option: 2
----------------------------------------

What kind of graph would you like to see?

1. Raw Time Series
2. Simple Moving Average
3. Cumulative Moving Average
4. Exponential Moving Average
5. Moving Average Convergence Divergence
6. ARIMA
7. Return to Main Menu


Please choose a menu option:
```

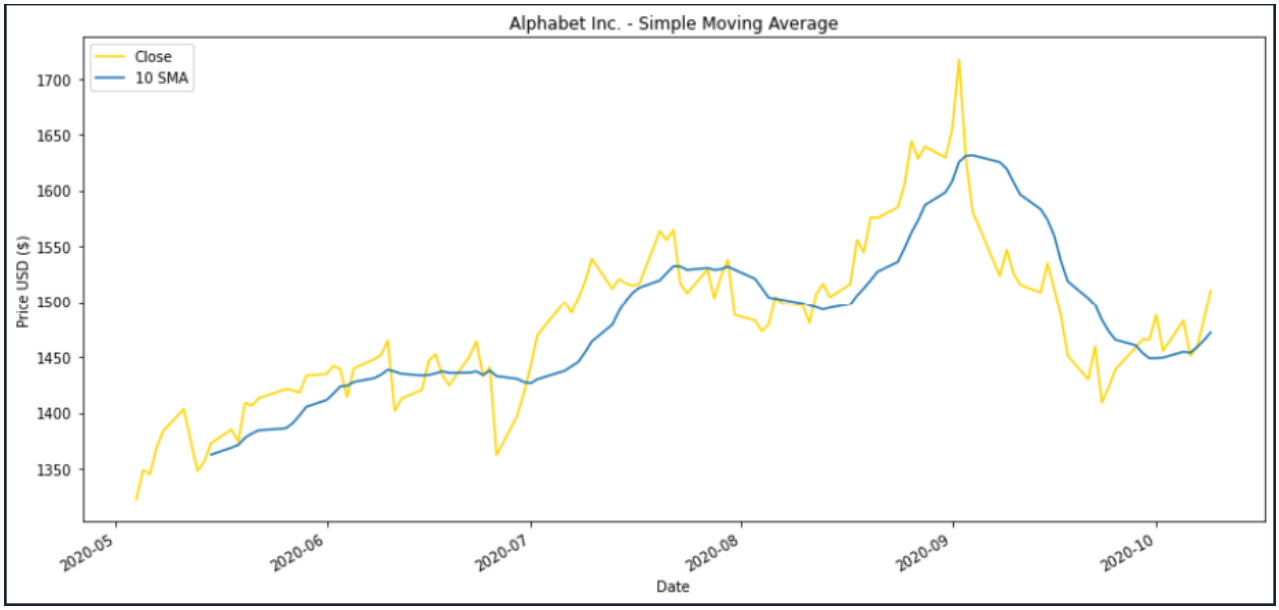
2.1 RAW TIME SERIES GRAPH

```
What kind of graph would you like to see?

1. Raw Time Series
2. Simple Moving Average
3. Cumulative Moving Average
4. Exponential Moving Average
5. Moving Average Convergence Divergence
6. ARIMA
7. Return to Main Menu


Please choose a menu option: 1

Enter Ticker Symbol: googl

Enter Start Date (YYYY-MM-DD): 2020-05-05

Enter End Date (YYYY-MM-DD): 2020-10-10

Enter what you'd like to graph (Open, High, Low, Close): Close
```



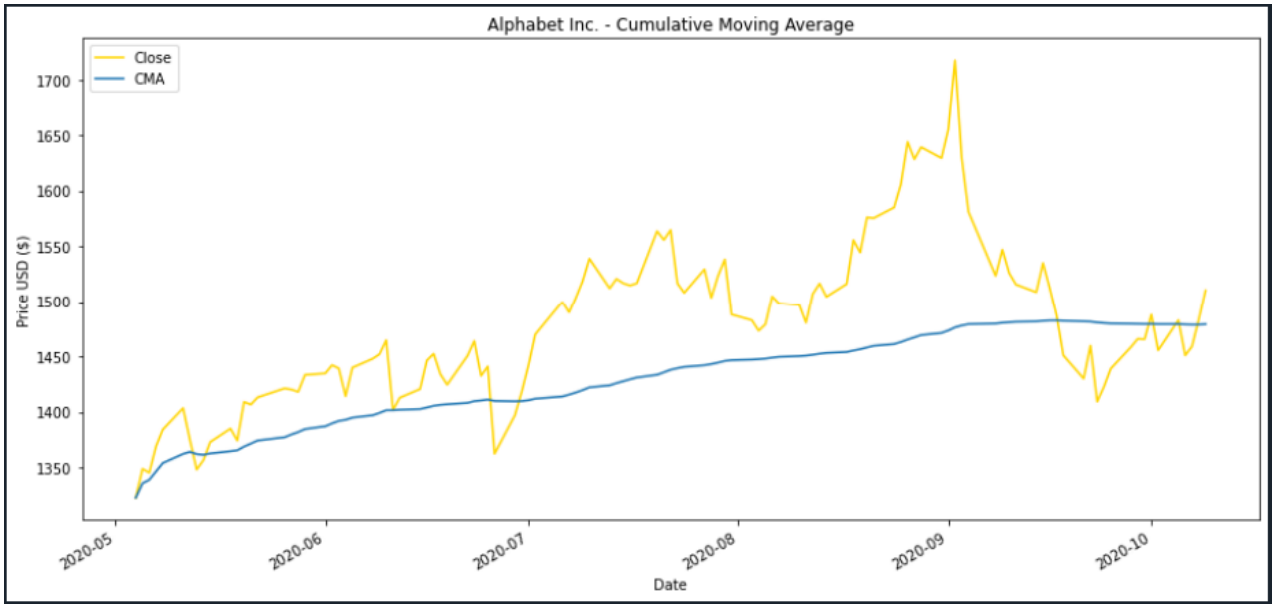
2.2 SIMPLE MOVING AVERAGE GRAPH

```
What kind of graph would you like to see?

1. Raw Time Series
2. Simple Moving Average
3. Cumulative Moving Average
4. Exponential Moving Average
5. Moving Average Convergence Divergence
6. ARIMA
7. Return to Main Menu


Please choose a menu option: 2

Enter Ticker Symbol: googl

Enter Start Date (YYYY-MM-DD): 2020-05-05

Enter End Date (YYYY-MM-DD): 2020-10-10

Enter what you'd like to graph (Open, High, Low, Close): Close

Enter number of days for the moving average: 10
```



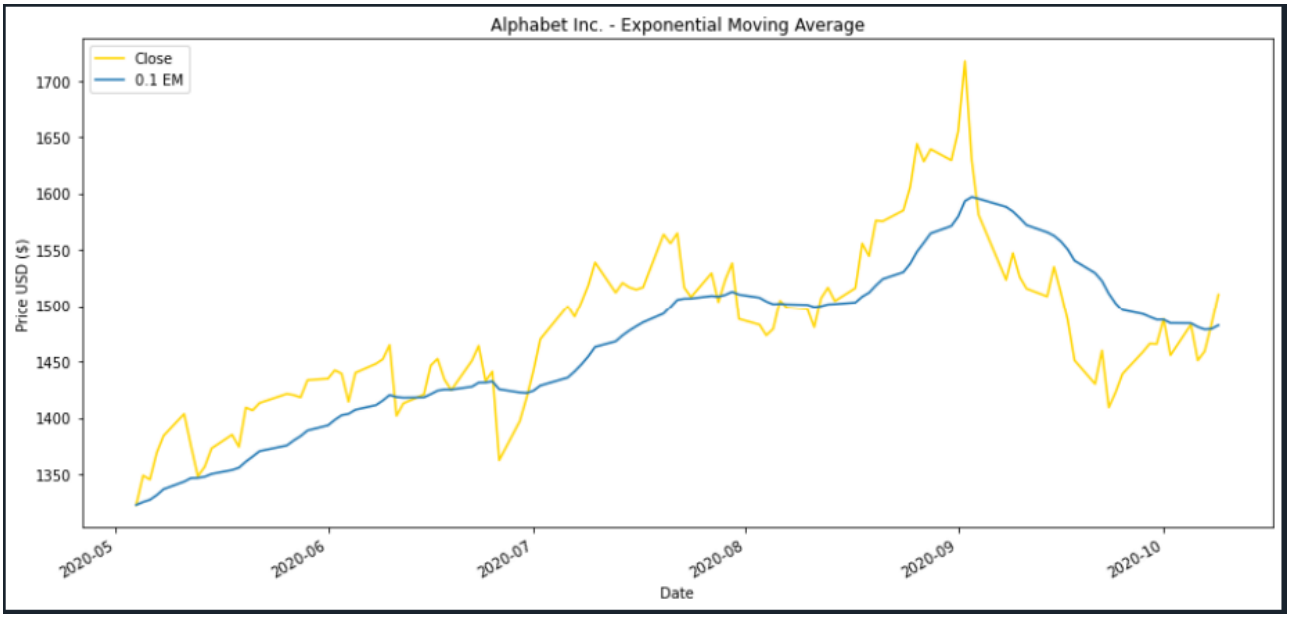
2.3 CUMULATIVE MOVING AVERAGE GRAPH

```
What kind of graph would you like to see?

1. Raw Time Series
2. Simple Moving Average
3. Cumulative Moving Average
4. Exponential Moving Average
5. Moving Average Convergence Divergence
6. ARIMA
7. Return to Main Menu


Please choose a menu option: 3

Enter Ticker Symbol: googl

Enter Start Date (YYYY-MM-DD): 2020-05-05

Enter End Date (YYYY-MM-DD): 2020-10-10

Enter what you'd like to graph (Open, High, Low, Close): Close
```



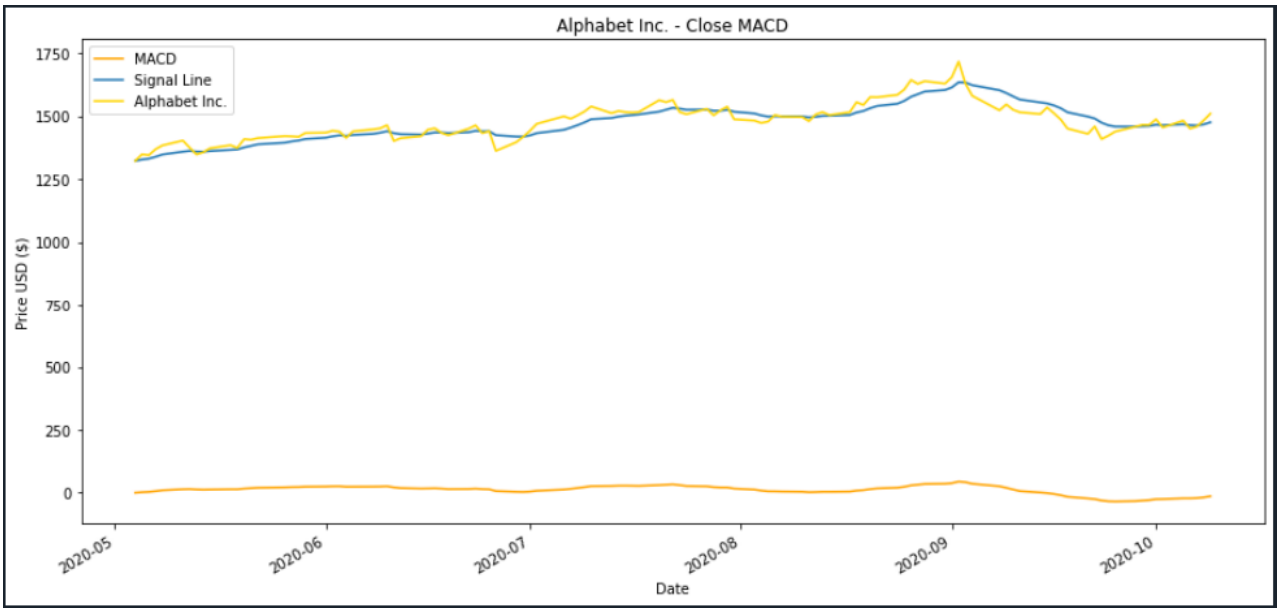
2.4 EXPONENTIAL MOVING AVERAGE GRAPH

```
What kind of graph would you like to see?

1. Raw Time Series
2. Simple Moving Average
3. Cumulative Moving Average
4. Exponential Moving Average
5. Moving Average Convergence Divergence
6. ARIMA
7. Return to Main Menu


Please choose a menu option: 4

Enter Ticker Symbol: googl

Enter Start Date (YYYY-MM-DD): 2020-05-05

Enter End Date (YYYY-MM-DD): 2020-10-10

Enter what you'd like to graph (Open, High, Low, Close): Close

Enter Smoothing Factor between 0 & 1 (eg 0.1): 0.1
```



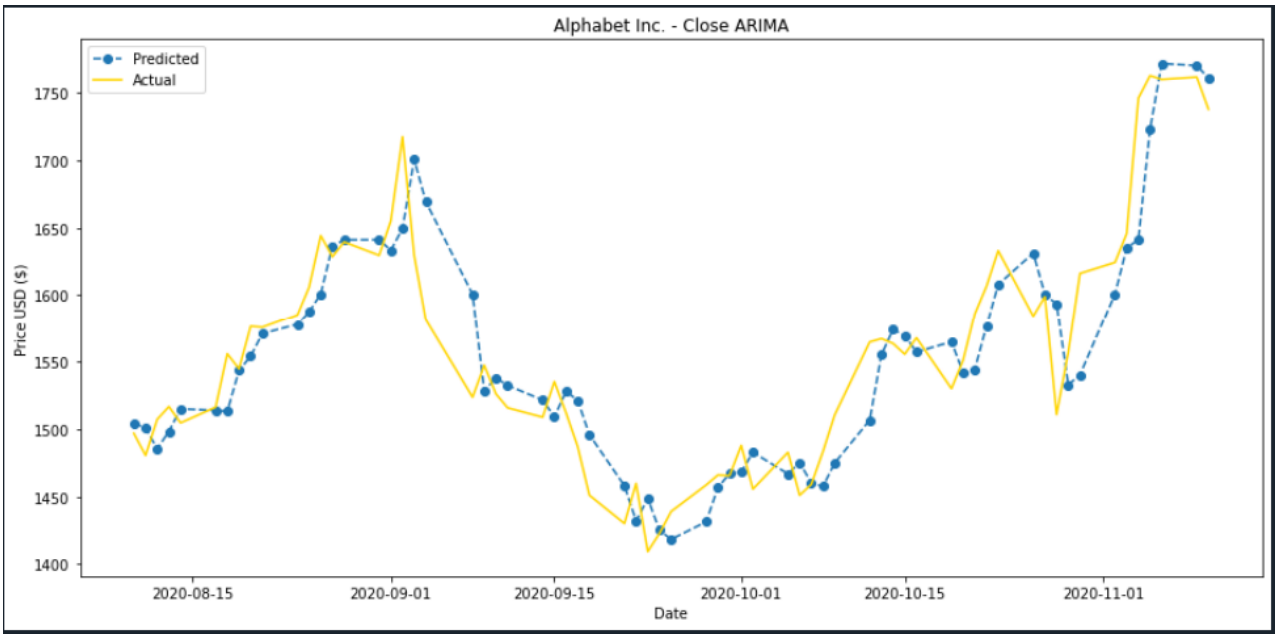
2.5 MOVING AVERAGE CONVERGENCE DIVERGENCE GRAPH

```
What kind of graph would you like to see?

1. Raw Time Series
2. Simple Moving Average
3. Cumulative Moving Average
4. Exponential Moving Average
5. Moving Average Convergence Divergence
6. ARIMA
7. Return to Main Menu


Please choose a menu option: 5

Enter Ticker Symbol: googl

Enter Start Date (YYYY-MM-DD): 2020-05-05

Enter End Date (YYYY-MM-DD): 2020-10-10

Enter what you'd like to graph (Open, High, Low, Close): Close
```



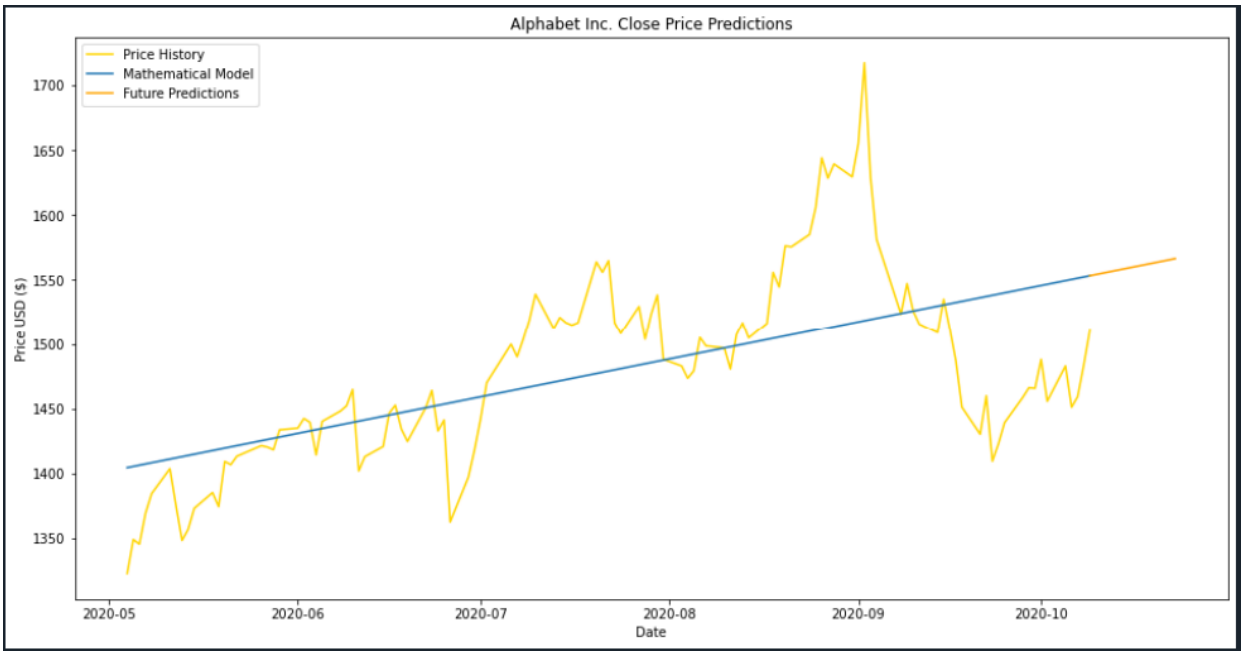
2.6 ARIMA GRAPH

```
What kind of graph would you like to see?

1. Raw Time Series
2. Simple Moving Average
3. Cumulative Moving Average
4. Exponential Moving Average
5. Moving Average Convergence Divergence
6. ARIMA
7. Return to Main Menu


Please choose a menu option: 6

Enter Ticker Symbol: googl

Enter Start Date (YYYY-MM-DD): 2020-05-05

Enter End Date (YYYY-MM-DD): 2020-10-10

Enter what you'd like to graph (Open, High, Low, Close): Close

MSE =  1205.3173
R2 =  0.8054
```



3. PREDICT CLOSING PRICE (LINEAR REGRESSION)

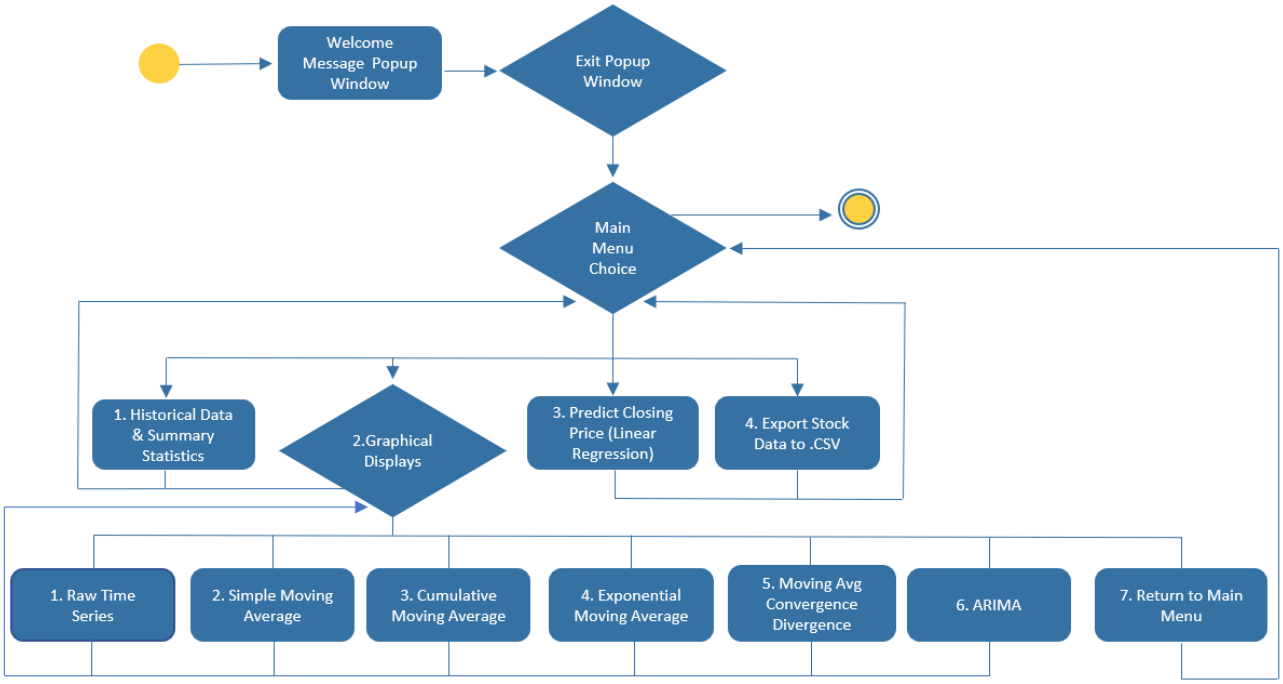
```
Please choose a menu option: 3

Enter Ticker Symbol: googl

Enter Start Date (YYYY-MM-DD): 2020-05-05

Enter End Date (YYYY-MM-DD): 2020-10-10

Enter what you'd like to graph (Open, High, Low, Close): Close

Please type how many days in the future you'd like a prediction for: 15

Closing price in 15 days should be $ [1566.46]
Linear Root MSE =  7.6936
Linear R2 =  0.3539
```



4. EXPORT STOCK DATA TO .CSV

```
Main Menu:
1. Historial Data & Summary Statistics
2. Graphical Displays
3. Predict Closing Price (Linear Regression)
4. Export Stock Data to .CSV
5. Quit Program


Please choose a menu option: 4

Enter Ticker Symbol: googl

Enter Start Date (YYYY-MM-DD): 2020-05-05

Enter End Date (YYYY-MM-DD): 2020-10-10
[**********************100%**********************]  1 of 1 completed

Data has been downloaded as: Alphabet Inc..csv
```

PROGRAM UML


Welcome Message Popup Window
Exit Popup Window
Main Menu Choice
1. Historical Data & Summary Statistics
2.Graphical Displays
3. Predict Closing Price (Linear Regression)
4. Export Stock Data to .CSV
1. Raw Time Series
2. Simple Moving Average
3. Cumulative Moving Average
4. Exponential Moving Average
5. Moving Avg Convergence Divergence
6. ARIMA
7. Return to Main Menu

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3. https://pandas.pydata.org/pandas-docs/stable/reference/api/pandas.DataFrame.rolling.html
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5. https://numpy.org/doc/stable/reference/generated/numpy.around.html#:~:text=The%20real%20and%20imaginary%20parts,a%20float%20is%20a%20float.&text=For%20values%20exactly%20halfway%20between,0.5%20round%20to%200.0%2C%20etc.

user guide

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