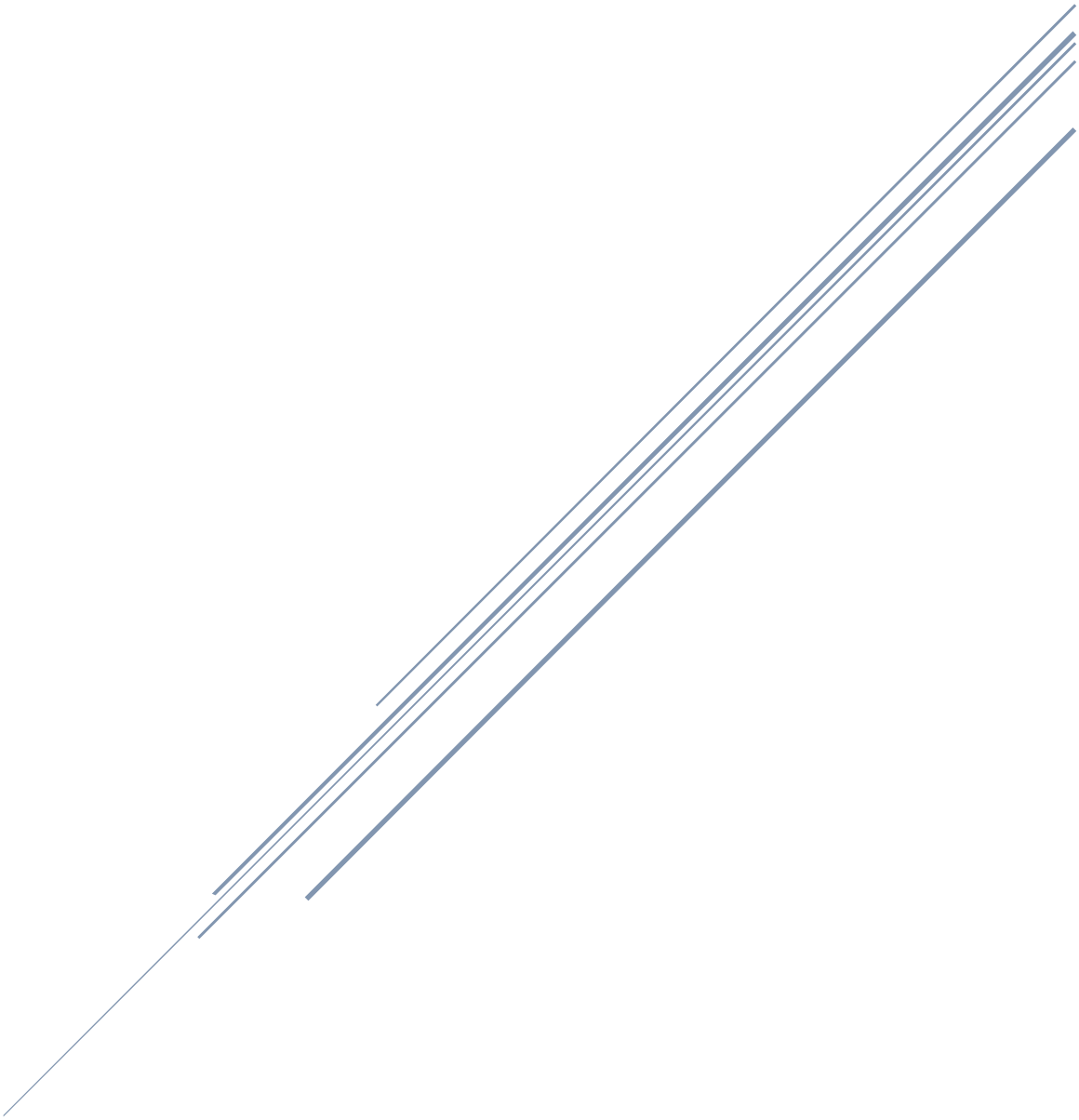
GROUP PROJECT:

Group 10: RRD FINANCE LTD

Rory Byrne 21373851

Rory O Brien 21356706

Dara Purcell 21305373



UCD

MIS20080: Introduction to Programming

Contributions of Each Group Member

- Rory Byrne 21373851: Coded main menu, the sub menus, date selection for both past performance and prediction , quit functions , coded error proofing in every section of the program including past performance and prediction sections , formatted the code to be as easy to use as possible for the user by providing clear instructions on screen for the user and by the using time delays so that the user has time to read the data before being presented with another option. Also split the code into two separate modules to make it easier to read and go through.

- Rory O Brien 21356706: Coded the past performance and prediction sections, utilising suitable modules and concise but clear code. Added options for the user for each of the various statistics and graphs available. Added inputs for users to decide within the visualisation what they wanted the moving average and exponential moving average to be calculated over. Similarly added input for the user to decide how far in the future they want to predict for the prediction section. Also wrote out the user manual corresponding to the code and drew out the user manual activity diagram on paper to align it correctly.

- Dara Purcell 21305373: Created the layout of the menu for the companies, designed the calendar which allows the user to choose a date they would like to view, and also the code for the various options that the user would like to find out about their chosen company. Designed the UML diagram so that the user would have a clear layout of our code. Checked the code for errors regarding loop errors or other errors that we encountered whilst running the code.

User Manual

1. Initial Instructions
2. Past Performance
3. Prediction
4. Closing the Program

1. Initial instructions:

The name of the file of our code that you run in the terminal is " RRDFinance.py" .
You will also need to download "RRDmodule.py " as code from this file is used in the " RRDFinance.py" file.

1.1 Homepage:

```
(base) roryobrien@dhcp-892bfcf9 MIS20080 % python finaldraft1.py
=======Welcome to RRD Finance LTD=======
We are an industry leading financial analytics firm providing in depth analysis
and statistics on our stock portfolio
Please avail of the information on our stocks below.
============================
| 1.Walmart          | WLM  |
| 2.Oracle           | ORCL |
| 3.Intel            | INTL |
| 4.ETSY             | ETSY |
| 5.Ralph Lauren     | RL   |
| 6.Pfizer           | PFE  |
| 7.Merck            | MRK  |
| 8.Microsoft        | MSFT |
| 9.Quit             |      |
============================
At any stage if you wish to change the stock you are analysing please return to
this page to select a new one.
Please select the stock you wish to view:
```

Once you have run the code, you will be prompted with this homepage. It will ask you to select the stock that you would like to view further information on.
Please type the **number** of the stock that you would like to view. For example, if you want to view Ralph Lauren (RL), you press 5 then enter.

If you would like to quit the program, you press 9. If you do decide to quit, you will first be asked if you're sure about this decision before the program shuts down.

1.2 Option of Type of Analysis:

```
Please select the stock you wish to view: 2
1. Past Performance
2. Prediction
3. Return to homepage
Please select option:
```

Once the stock is selected, you will now be asked if you want to view Past Performance, Prediction or to Return to the homepage. Once again, please select the **number** corresponding to your choice.

1.3 Dates

```
Please input what date you would like to begin analysis
Please only input numerical values (Example: 1st June 2022= 01-06-2022)

At RRD Finance LTD we provide data from 2014 up to and including 2022
From which year would you like to begin?
If you wish to return to the previous menu please input b: 2018

From which month would you like to begin? (Example June= 06): 08
==================================
| M  | T  | W  | T  | F  | S  | S  |
----------------------------------
| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
----------------------------------
| 08 | 09 | 10 | 12 | 13 | 14 | 15 |
----------------------------------
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
----------------------------------
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
----------------------------------
| 30 | 31 |
==================================

From which day of the month would you like to begin?
Input b to return to month selection.:09
```

If your choice is to view either Past Performance or Prediction, you will be asked to insert the dates you would like to start the analysis from. You will first be asked to put in the year, then the month, and finally the day.

** From this point onwards, there is a separation depending on whether you chose Past Performance or Prediction. Please read whichever one is relevant to your choice

2. Past Performance

If you have previously selected Past Performance, you will now be led to seeing how the company's stock has fared in the past

2.1 Continuation of Dates for Past Performance

```
Would you like to conclude analysis on today's date?:
Please input Yes or No: Yes
Start date = 2018-08-09
End date = 2022-11-26 21:26:25.854979
```

After you have put in the dates in 1.3, you will be asked if you want to conclude the analysis on today's date, or choose another date in the past to conclude the analysis on. If you choose another date, you will be taken through the exact same process as with the **Dates** section above

2.2 Option of format of Past Performance

```
Would you like to see the statistical or visual description of past performance?

 1. Statistics
 2. Visuals
 3. Back
Please select option:
```

You will now be asked if you want to view statistics or visuals, or to go back to the selection of dates again. Once again, please choose the **number** corresponding to the option you want to choose.

2.2.1 Statistics

```
Please select option: 1
Statistics:
1. Mean
2. Max
3. Min
4. Quartiles
5. Standard Deviation
6. Range
7. Coefficient of Variation
8. Back
Please select option:
```

If you choose statistics , you will get the opportunity to view 7 different statistics taken from the stock price of your chosen company, and calculated during the time period of your chosen

dates. Please choose the **number** corresponding to the statistic you would like to get the result of. There is also an option to go back to the previous menu (2.3)

2.2.2 Visuals

```
Please select option: 2
1. Raw time series
2. Trend lines
3. Moving Averages
4. Weighted Moving Averages
5. Back

Please close the graph window after viewing in order to proceed with further ana
lysis

Please select option:
```

If you choose visuals, you will have the option of viewing 4 different graphical tools. Once you have selected the number of the option you would like to view, the graph of the indicator corresponding to the time frame selected will pop up onto your screen.
* You must "x" out of this new graph window before trying to continue the program.*

3. Prediction

If you have previously selected Prediction, you will now be led to seeing how the company's stock is predicted to do in the future by our highly sophisticated algorithm.

3.1 Continuation of Dates for Prediction

```
How many days would you like this prediction to be for?:
```

After you have put in the dates in 1.3, you will then be asked how many days you would like to predict in the future.

3.2 Type of Model

```
Would you like to view a Linear Regression Model or a Tree Regressor Model?
1.Linear Regression Model
2.Tree Regressor Model
3.Return to time selection
Please select option:
```

Now, you will be asked whether you would like to use a tree regressor model or linear regression model for calculating the future stock prices to your chosen date.

3.3 Option of format of Prediction

```
Would you like to see a statistical or visual represenation ?
1.Statistics
2.Visualisation
3.Back
Please select option:
```

Next, you will be asked if you want to view the statistics or the visualisation of the type of prediction chosen, or to return to the menu in 3.2

3.3.1 Statistics

```
Prediction Statistics:
1.Price prediction
2.Error statistics
3.Back
Please select option:
```

If you have chosen statistics, you will be asked if you want to see the price prediction or the error statistics. You will also have the option to return to 3.3.

```
Please select option: 1


The price($) of ['MRK'] stock 57 days from now is predicted to be:
84.88273995367065
```

If you choose price prediction, like above, the predicted stock price in the amount of days chosen in 3.1 will be printed to the screen.

```
Please select option: 2


Linear Regression Model Error Statistics:
Mean Absolute Error: 4.077348049107105
Mean Squared Error: 30.51927881032179
Root Mean Squared Error: 5.524425654339263
```

If you choose error statistics, the mean absolute error, mean squared error, and root mean squared error will all print to the screen, and once again these statistics correspond to the time in the future inputted in 3.1.

3.3.2 Visualisation

If you choose visualisation, a graph of the chosen type of predicted stock performance, from today's date, up until the number of days in the future inputted in 3.1 will show up in a new window.

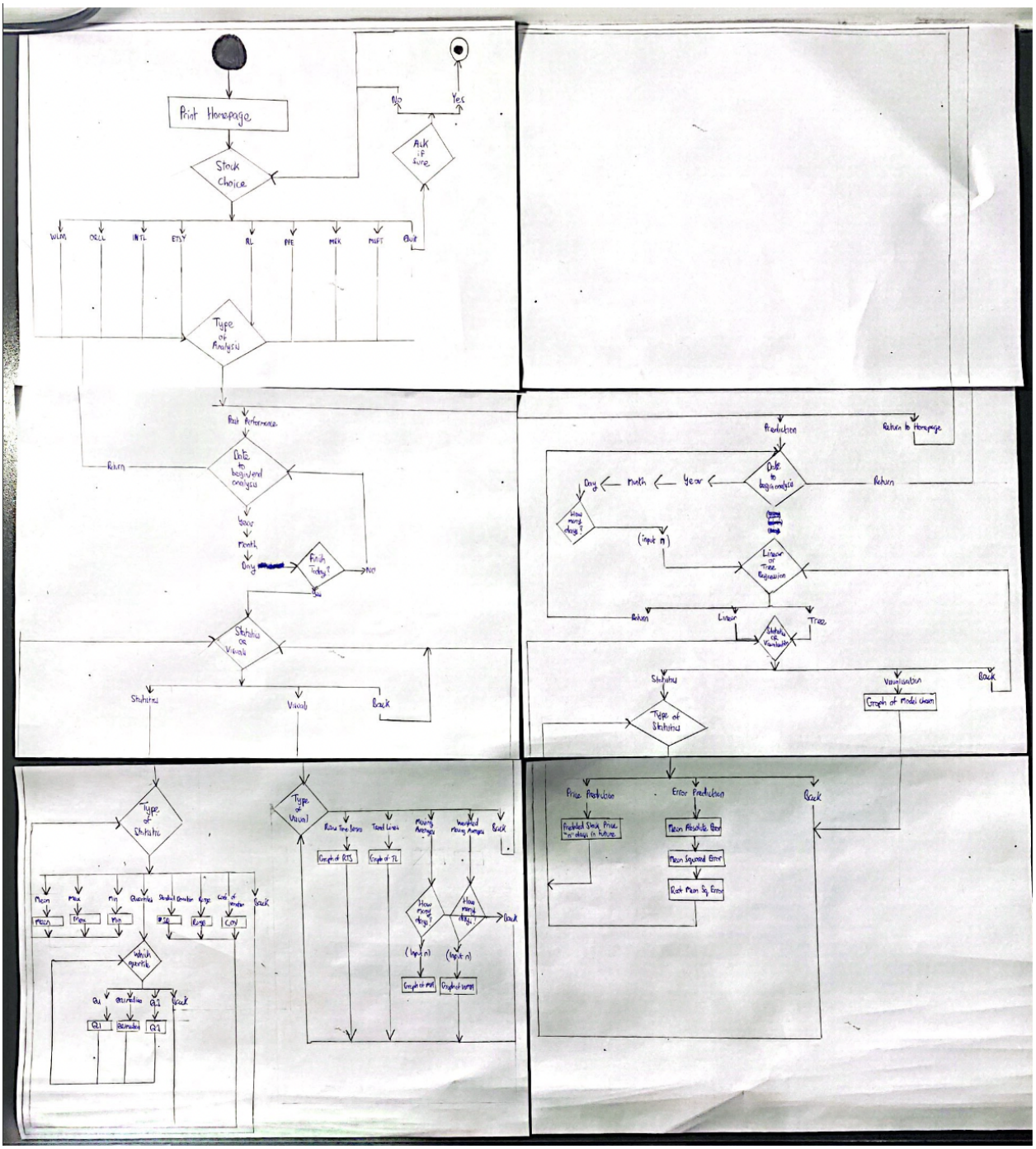
* You must "x" out of this new graph window before trying to continue the program.*

4. Closing the Program

If at any point you would like to close the program abruptly, please input CTRL+C. Otherwise you can close the program by manually following the instructions printed on the screen at each point of the code to return to the homepage and then quitting.

UML Activity Diagram

**I have also attached the PDF of this diagram below to make it easier for you to zoom in to view the specific parts in greater detail



[UML Diagram]