Business Cases with Data Science – Case 5

MASTER DEGREE PROGRAM IN DATA SCIENCE AND ADVANCED ANALYTICS

Cryptocurrency Data Visualization – Investments4Some

Group AA

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1. Introduction

Data Visualization is a technique that uses graphs and charts to answer questions. A large portion of a data scientist's work involves data visualization, and while some skills may have obvious applications, data visualization is not a one size fits all skill. Each data visualization task is dependent on the type of information being explored, how the visualization will be used, the intended audience, and how the data will be obtained and processed.

2. Business Understanding

Working as AA finance, a department of Investments4Some, the goal of this project is to develop a financial dashboard with visualizations for assets. The goal is to have a flexible dashboard, that fetches daily updated data about any arbitrary financial asset. The objective is to create some visualizations with important insights about the assets, in the dashboard should be possible to analyse and compare any type of asset.

The dashboard was ordered by Warner Buffer and Gil Bates, partners of Investments4Some, and they expect to use this dashboard to inform the investment decisions of their internal financial team and external stakeholders. They expect that this dashboard will be available for as many assets as possible.

3. Datasets

2.1 Data sources and generation of the Datasets

For this project no dataset was provided. With this on mind we used the Yfinance library that extracts Data for any asset that is available at Yahoo finance and this data must be updated daily.

2.2 Datasets description

Regarding the datasets that we extracted from yahoo finance, we choose to work with datasets from the last five years. These datasets are updated daily, and they contain the same information as the following example:

	Open	High	Low	Close	Volume	Dividends	Stock Splits
2017-05-26	36.4466	36.5034	36.2833	36.3543	87710400	0.0000	0.0000
2017-05-30	36.3094	36.5484	36.2881	36.3685	80507600	0.0000	0.0000
2017-05-31	36.4395	36.4869	36.0632	36.1532	97804800	0.0000	0.0000
2017-06-01	36.2502	36.2881	36.0254	36.2526	65616400	0.0000	0.0000
2017-06-02	36.3472	36.7898	36.1839	36.7898	111082800	0.0000	0.0000
2017-06-05	36.5271	36.5532	36.3189	36.4301	101326800	0.0000	0.0000
2017-06-06	36.4230	36.8750	36.3946	36.5531	106499600	0.0000	0.0000
2017-06-07	36.6881	36.9152	36.5602	36.7709	84278400	0.0000	0.0000
2017-06-08	36.7425	36.8111	36.5413	36.6809	85003200	0.0000	0.0000
2017-06-09	36.7283	36.7283	34.5580	35.2586	259530800	0.0000	0.0000

All the tables have the following information:

-Open: The value, in USD, of the asset when the stock market opened

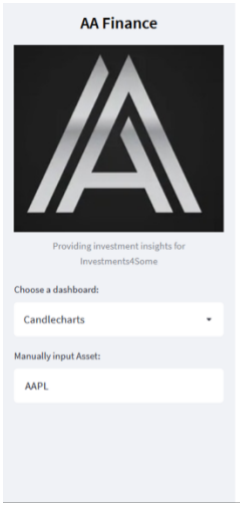
-High: The higher vale, in USD, of the asset registered on that day
-Low: The lower vale, in USD, of the asset registered on that day
-Close: The value, in USD, of the asset when the stock market closed
-Volume: The number of transactions registered on that day
-Dividends: Represents the days where the companies give dividends.

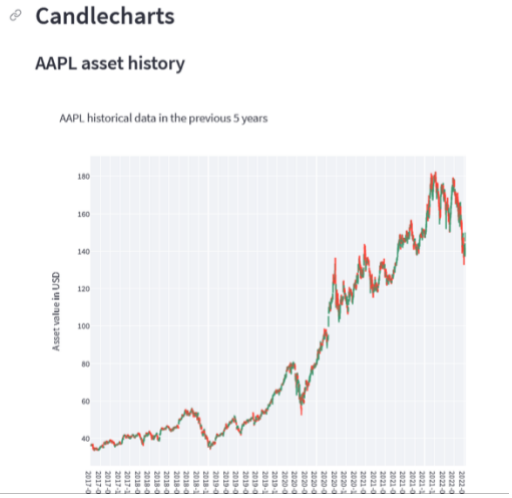
4. Dashboard Layout and Interactivity

Regarding our dashboard implementation, we tried to develop it based on the knowledge that we acquire during the classes of Data Visualization Course but also with some layouts available in the Streamlit Gallery.

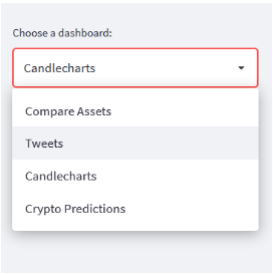
In our project, we used html components to divide the areas in our dashboard. To provide a general view of the data before presenting the theme itself, we decided to incorporate a sidebar with descriptive text of the AA department.

Regarding the layout, there are some considerations to be done:





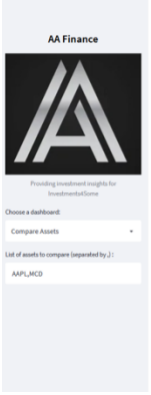
This example shows the view of the dashboard when it's open. First, we include a drop-down column with the different visualizations that are included:



On this drop-down, the visualizations are the Candle charts for each asset, the tweets about the assets, the comparison of assets and the crypto predictions done in the business case 4.

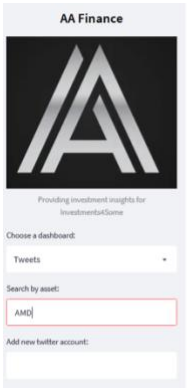
5. Visualizations

In what concerns to our first visualization, the candle chart, once the user manually input the asset, he will see the historical values for the asset that was chosen. On the following example, with the Apple stock, the user can see all the historical values, by passing with the mouse in some day, the values for that day will appear. On this visualization the user can also select a period and see a table with the detailed values for the asset.



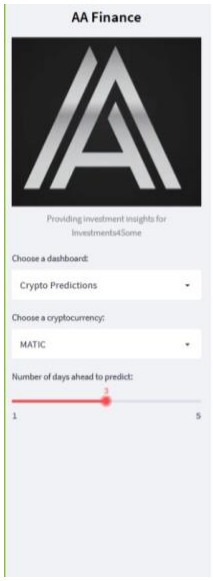
About the second visualization, the comparison of assets, the user must manually input the name of the assets that he/she wants to compare. After that, the graphic will show a chart with the close value for each asset that was inputted.

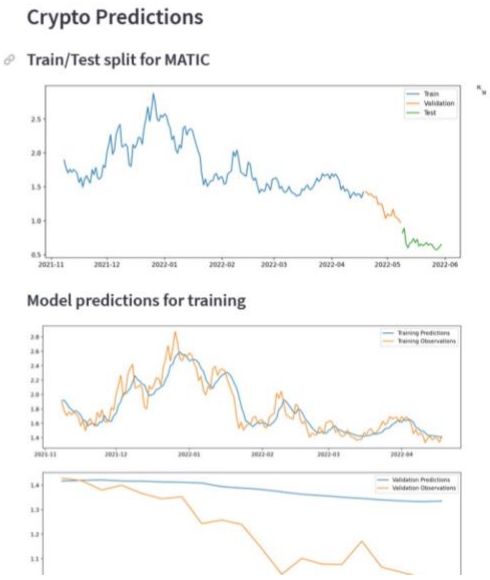
Regarding the tweets visualization, we stick to filter the tweets of the users that are known as good traders on tweet. Once the user chooses this view, the last tweets of these users will be shown, not only the ones about assets but all of them. With this on mind, it's important to highlight that:



On the first filter, the user must introduce the asset he/she wants to search. After this, the dashboard will show the tweets of the pre-defined list of users for that asset. Once a tweet mentioned the asset it will be available with the candle chart of the asset. Lastly, if the user wants to add other account to search for tweets, it can be done by adding the username without the "@", this user will be stored for all the searches until the dashboard is closed again.

Lastly, in what concerns to our final visualization about the crypto currencies forecasting (done one BC4), we can say that it works as the follow example:

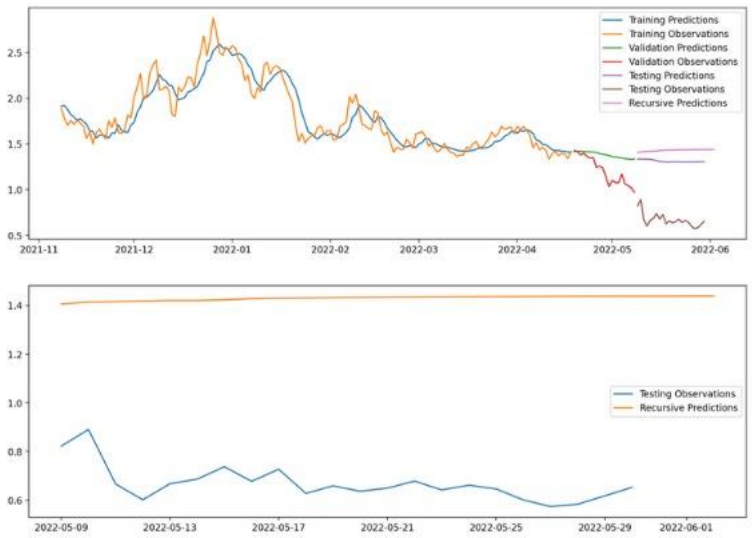




After select the dashboard "Crypto Predictions", the user must use the second drop down and choose one of the ten currencies that are available. Then, the user must use the slider to choose the number of days that he/she wants to predict. The maximum number of days to predicted was limited to 5 days for accuracy reasons.

In the end of this step, the user will be able to see the Train/Test split for the currency, the model predictions for training and the following charts:

Predicted value of MATIC in the next 3 days




```
[
  0 : "array([1.4386287], dtype=float32)"
  1 : "array([1.4388225], dtype=float32)"
  2 : "array([1.4389873], dtype=float32)"
```


Besides the two presented charts, the user will be able to see an array with the values for each day that the prevision was done.

6. Conclusions, Limitations and Future Work

After implementing our dashboard, we can say that we achieved the aim of the project. Our dashboard it's able to compare any type of asset (Stocks, funds, cryptos, etc.) and with the tweets visualizations, we think that we added valuable information to the project. In conclusion, we believe that our dashboard contained all the necessary elements to do a good analysis.

Regarding the limitations, we think that one can be the size of our charts, because when the asset exists from a long time ago, the user can have the need of extend the chart. Other limitation could be that the input of the assets that the user wants to visualize needs to be done manually, by introducing the ticker of the asset, in this case, for us this is not a limitation because we are providing a dashboard for financial analysts, that must have knowledge about the topic.

Lastly, concerning the future work, we have the opinion that this dashboard could become more visual interactive and responsive. These things could be achieved by becoming the dashboard faster and better designed.

7. References

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[5] - https://algotrading101.com/learn/yfinance-guide/

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[7] - https://pypi.org/project/yfinance/

[8] - https://www.youtube.com/watch?v=0ESc1bh3eIg