Brief Report on 5130Of2022 IWS1 Project

Group Members

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Introduction

At the beginning of the semester, me and my group mates decided on creating a react web app for crypto currency tracking and visualization, where a user would be able to enter his/her transactions, see them on the dashboard and have access to their total portfolio analysis, with total investment, profit/loss ratios and their portfolio outlook into the future, as stated in the project proposal. We have created the web application now that lets users add transactions to their portfolio, and a portfolio analysis button, where users will be able to see the visualization of his/her investments, in terms of profit/loss, total value.

Problem and our Approach

The problems, we aim to address with our application are: -

1. There are apps for making investments, and there are apps like Coinstats to track investments, but per my knowledge and research, an app to track investments and analyze the same investment to decide(buy/sell/hold) is lacking. The root of my motivation for the project stems from this. As mentioned above, we aim to create an application that solve the problem of tracking and analysis within the same platform without having to go back and forth.

2. The first problem of designing the tracking system for cryptocurrency would be straight forward, the second part of providing portfolio analysis would be challenging, we would have to research about ML algorithms that would produce the best results against non-stationary data, an algorithm like random Forrest or SVM would help, but also our feature space has to be rich for ideal predictions, for crypto data, features can be 52 week high/low, trading volume, average open price, social media interaction volume(via sentiment analysis) and the output would be price(closing) on a time period in the future(60 day/90 day). We would have to add more features to make the model more robust, but this is a good starting point.

   We ended up going with LSTM or Long Short-Term Memory deep learning model for forecasting, the model was developed by my group mate Sahithi Nallani.

Tools Used

For the backend code, I used the flask API framework and build the endpoints with python. For the database, I build it using docker postgresql and docker compose as mentioned in my weekly reports and coingecko API for crypto live prices

I was responsible for building the backend/server-side code for the app. In doing so, I build the following API end points

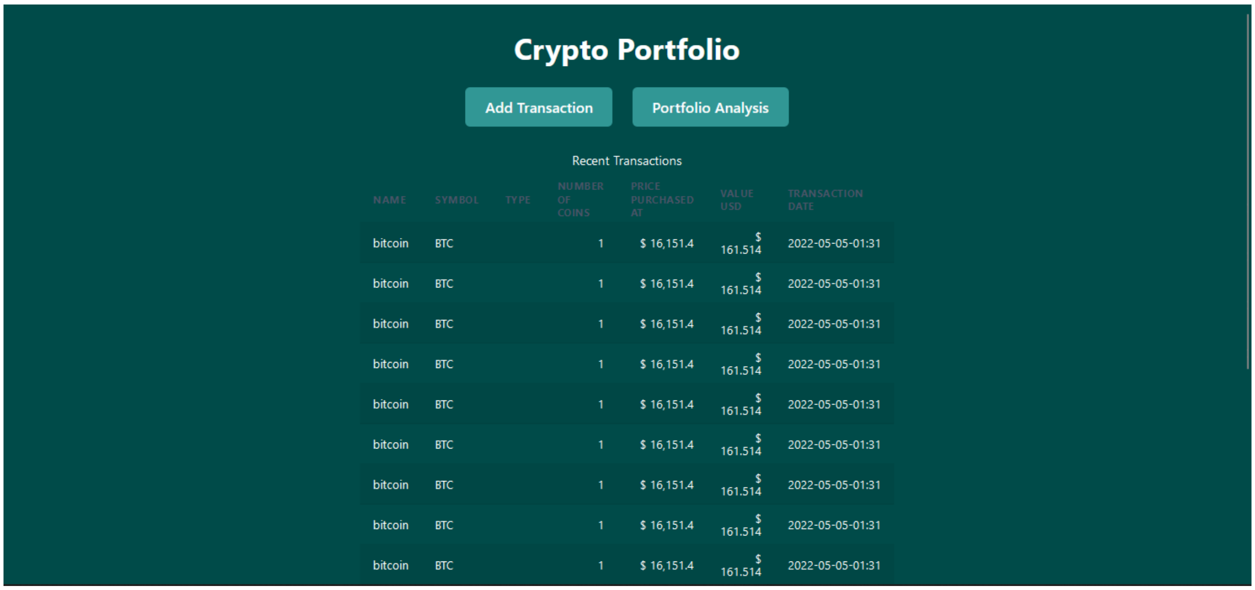
1. get_transactions – the endpoint is used to retrieve transactions from the database, using a select query, the endpoints return a JSON response, which is used by the frontend to display transactions
2. post_transactions – the endpoint is used to add a transaction that the user wishes to add, I wrote this endpoint to check if the user is adding a buy or sell transaction and based on that check if the transaction is valid (so the user cannot add a transaction to sell 2 bitcoins when he only has 1).
3. get_details_coinwise – the endpoints gets the total coins, total investment in terms of equity and value and live price. I put a check in place where only transactions where status='active' are selected, and ones with 'delete' are ignored. The endpoint returns a JSON response which is used by the frontend code for the portfolio analysis function.

4. delete_transaction – the endpoint is used to remove a transaction, in a case that the user accidentally adds a transaction, I did not remove the transaction from the database, but set a flag called status and set it to delete if the user decides to remove the transaction from his portfolio.

The database for the application was built using Docker, a containerized PostgreSQL database was created using docker compose. And the server-side infrastructure and code was connected to the database using psycopg python library to make PostgreSQL connection pools

Current Progress

We as a team are happy with our progress so far, and our app is doing what we intend, below is the image of our app, in its current state



As seen above, we have a button to add transaction, and another for portfolio analysis, once the user clicks on portfolio analysis, the second picture would open.

We are left with the following things to complete

1. Sometimes, when I click on the back button, and open portfolio analysis it takes time or fails to load. Must investigate this bug and find/fix it
2. We are thinking of changing the background of the app to teal color, right now we just went with the basic black color. Also thinking of changing the visualization(charts) color to something that matches teal background
3. In portfolio analysis, we wish to add a forecast for bitcoin, the model is already built by, and the endpoint is created, we are looking for the ideal place to display it on the application

Distribution of Work

Group members

Nagarjuna Kocharla

Sahithi Nallani

Niharika Chundury

Nagarjuna Kocharla

I was responsible for writing the backend code for the app, all the code written by me is under backend directory, apart from prediction_model.py, with instructions and comments in the code

Sahithi Nallani

was responsible for building and testing the LSTM model to predict bitcoin future price, and the code is under backend in prediction_model.py

Niharika Chundury

was responsible for building and testing frontend code for the app, and the code is under frontend.