

Chapter 9

Python–Powered Stock Market Analysis Leveraging Data Science Techniques for Informed Investment Decisions

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ABSTRACT

We might become interested in stock market investment during the course of our lives. But to do that, we first need to have a clear understanding and analysis of the market. We may be unsure of whether to buy or sell stocks; thus, this is vital. It can be challenging to determine whether a stock will rise or decline in value or whether it will be a successful investment. In the event that the stock decreases, we can be unsure about whether to sell or stay on to it. Given the large number of investors who purchase stocks globally and the potential for significant losses, stock market analysis is crucial. The goal is to develop a project that analyzes the stock market and aids in our decision-making when it comes to purchasing and selling stocks.

INTRODUCTION

Understanding the Stock Market is very important in this modern age. With the high inflation and the war happening in Ukraine, it is important to understand how investments work (NeuralNine et al., n.d.; Ahmad Bazzi et al., 2020). By choosing this project we will have an insight investment decision making, by informing the investors the current market trends, and performance on companies or corporates (Abdar et al., 2019; Alippi et al., 2019). By this, investors can identify the investments opportunities and the risks associated with it. The project's goal is to conduct a stock market analysis to assist investors in making purchase and sell choices (Macarty et al., 2021). We have mentioned a dataset with 251 rows and 7 columns that contains information on Tesla's stock values in addition to giving a brief introduction

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to why understanding the stock market is crucial in the present era (Kuznetsov et al., 2018; Qin et al., 2020; Raza et al., 2019). We have provided a 20-step algorithm that downloads and examines historical Tesla stock price data using a variety of libraries and modules, including `plotly.graph_objects`, `plotly.express`, `datetime`, `timedelta`, and `pandas`. A flowchart showing the algorithm's steps was also provided. Last but not least, we provide sample code for the algorithm's first stage, which collects data on Tesla's historical stock price and shows it as a Candlestick chart (Algovibes et al., 2021; Kharwal et al., 2022; James et al., 2017).

DATASET DESCRIPTION

- **Size:** 18974
- **Python code:**

```
from pathlib import Path
sz = Path("/content/TSLA.csv").stat().st_size
print(sz)
```
- **No. of col.: 7 & No. of row: 251**

```
# import module
import pandas as pd
# read the csv file
results = pd.read_csv("/content/TSLA.csv")
# display dataset
print(results)
```

Figure 1 shows Values of Tesla Stock. Figure 2 shows Flowchart of Algorithm from Step all steps.

Input: This project focus on the analysis of the stock market therefore, the input will be different stocks, in order to make a buying or selling decision (Shah et al., 2018; Yoo et al., 2018; Chen et al., 2013).

Excepted Output: The expected output of this will be for us to analyze the stock based on historical data therefore it will be outputting the date and time, the amount it opened, the peak high value and low value of the stock, the time it closed and the volume it was traded (Huang et al., 2019). As well as it will output historical charts to make a better buying or selling decision (Brownlee et al., 2018; Chollet et al., 2018; Fawcett et al., 2018).

ALGORITHM

- Step 1. Importing the essential libraries and modules, such as `plotly.graph_objects`, `plotly.express`, `datetime`, `timedelta`, and `pandas`.
- Step 2. Obtaining the current date using the `date.today()` method, converting it to a string format (YYYY-MM-DD), and then assigning it to the `end_date` variable.
- Step 3. Subtracting 365 days (1 year) from the current date using the `timedelta` method, translating the result to the string format YYYY-MM-DD, and assigning it to the variable `start_date` (Chen et al., 2021; Cheng et al., 2016; De Lima Silva et al., 2020).

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