

AI & Machine Learning Systems Engineering (MSE) Report

Name: Ananya Bharti

University Roll No: 202401100400035

Email id: ananya.2428cseaiml16@kiet.edu

Branch: CSEAIML

Section: A

Class roll no: 35

Problem Statement

Stock Price Movement – Plot and analyze short-term stock price movement and identify trends.

Breaking Down the Problem Statement:

1. Plotting Stock Price Movement

- Collect stock price data over a short period (e.g., daily or intraday prices).
- Visualize the price changes using charts such as line graphs, scatter plots, or bar charts.

2. Analyse Short-Term Stock Price Movement

- Identify patterns in the price movement (e.g., sudden spikes, gradual increases or decreases).
- Examine factors influencing these changes, such as earnings reports, market news, or investor behavior.

3. Identify Trends

- Determine whether a stock is in an **upward trend (bullish)**, **downward trend (bearish)**, or **moving sideways (neutral/consolidation)**.
- Use statistical techniques, moving averages, or trend lines to predict future movement.

1. Data Collection

- **Source:** Obtain stock market data from financial APIs (e.g., Yahoo Finance, Alpha Vantage) or CSV datasets.

◦ METHODOLOGY

- **Data Points:** Include stock name, date, opening price, closing price, highest and lowest prices, and percentage change.
 - **Timeframe:** Short-term movements (intraday, daily, or weekly price changes).
-

2. Data Preprocessing

- **Handling Missing Values:** Remove or impute missing data points.
 - **Data Formatting:** Convert date columns to proper datetime format.
 - **Calculate Short-Term Price Movements:** Compute percentage changes in price to analyze volatility.
-

3. Data Visualization

- **Scatter Plot:** Shows short-term price movements for different stocks.
 - **Line Graph:** Displays stock price fluctuations over time.
 - **Histogram:** Analyzes the frequency of specific price changes.
 - **Trend Line:** Helps detect patterns in stock price movement.
-

4. Identifying Trends

- **Moving Averages:** Use Simple Moving Average (SMA) or Exponential Moving Average (EMA) to identify trends.
 - **Regression Analysis:** Fit a trend line using linear regression to observe upward or downward movement.
 - **Volatility Check:** Analyze price swings to determine stability or fluctuations in stock price.
-

5. Interpretation & Insights

- **Bullish Trend:** Consistent upward movement, indicating a good buying opportunity.
 - **Bearish Trend:** Continuous decline, signaling caution for investors.
 - **Sideways Movement:** No significant change, meaning market consolidation.
 - **Volatile Stocks:** Identify stocks with frequent large price swings, suitable for short-term traders.
-

6. Conclusion & Future Work

- Use insights from the analysis to make better trading decisions.
- Extend the study to longer timeframes for a broader perspective.
- Implement machine learning models for predictive trend analysis.

CODE OF THE PROBLEM STATEMENT

```
#importing
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
#google colab linking
from google.colab import drive
drive.mount('/content/drive')
#my drive
df = pd.read_csv('/content/drive/MyDrive/mse dataset.csv')
# Display the first few rows of the dataset
print(df.head())
# Display the first few rows of the dataset
print(df.head())
# Convert string to list
df["Short Term Price Movement (%)"] = df["Short Term Price Movement (%)"].apply(eval)

# Plot first 5 stocks
plt.figure()
for i in range(5):
    plt.plot(df["Short Term Price Movement (%)"][i], label=df["Stock Name"][i])

plt.legend()
plt.show()
# Plot histogram directly using pandas
df.explode("Short Term Price Movement (%)")["Short Term Price Movement (%)"].hist(bins=10, edgecolor='black')
plt.xlabel("Price Change (%)")
plt.ylabel("Frequency")
plt.title("Distribution of Short-Term Price Changes")
plt.show()
# Calculate average short-term price movement for each stock
df["Average Movement"] = df["Short Term Price Movement (%)"].apply(lambda x: sum(x) / len(x))

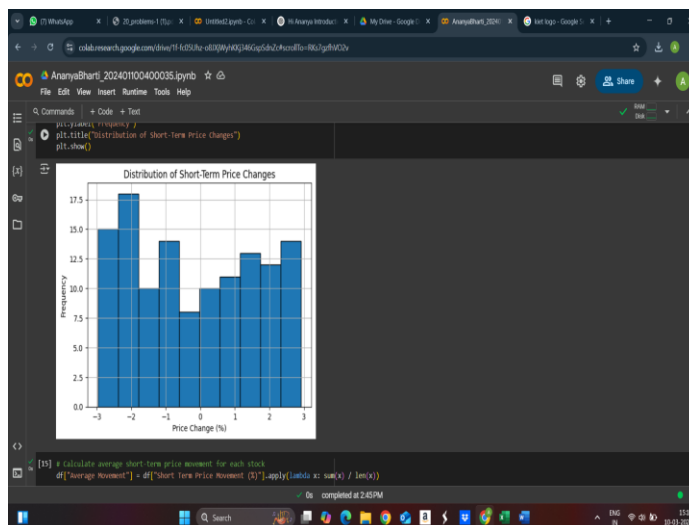
# Plot bar graph
plt.figure(figsize=(12, 6))
plt.bar(df["Stock Name"], df["Average Movement"], color='skyblue')
plt.xlabel("Stock Name")
plt.ylabel("Average Price Change (%)")
```

```
plt.title("Average Short-Term Price Movement by Stock")
plt.xticks(rotation=90)
plt.show()

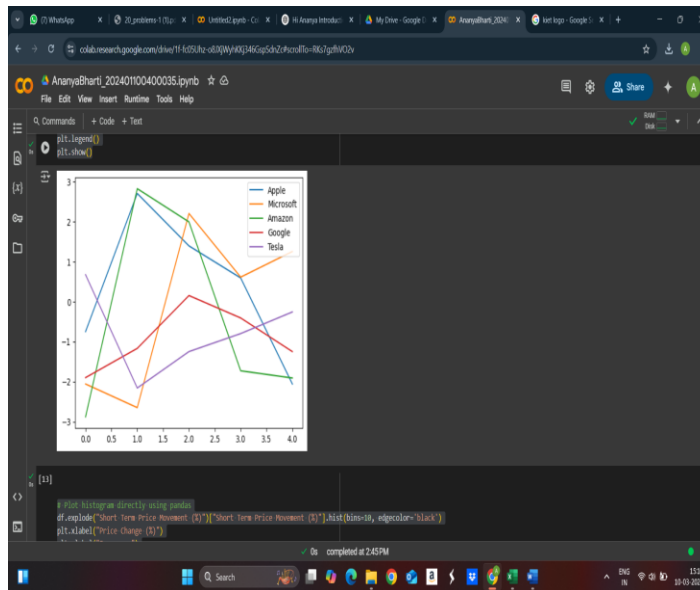
# Calculate average short-term price movement for each stock
df["Average Movement"] = df["Short Term Price Movement (%)"].apply(lambda x: sum(x) / len(x))

# Plot scatter plot
plt.figure(figsize=(12, 6))
plt.scatter(df["Stock Name"], df["Average Movement"], color='blue',
alpha=0.7)
plt.xlabel("Stock Name")
plt.ylabel("Average Price Change (%)")
plt.title("Average Short-Term Price Movement by Stock")
plt.xticks(rotation=90)
plt.grid(True)
plt.show()
```

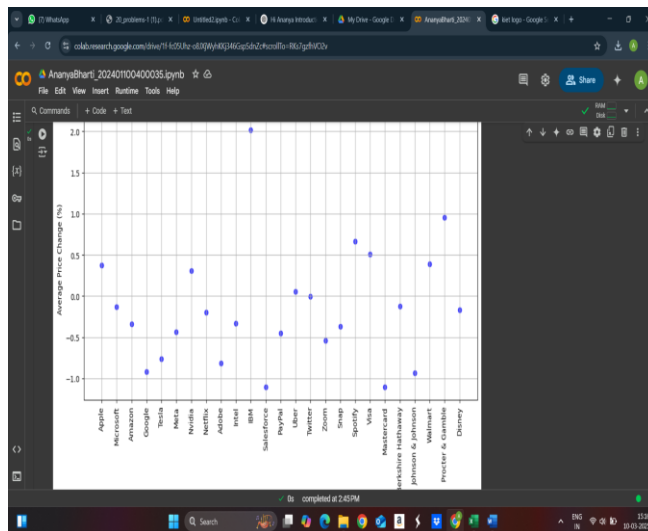
OUTPUT:



The bar graph representation of price changes.



Trend analysis of daily price change.



Average short term price movement of the stock.

REFERENCES:

1 VS CODE

2 WIKIPEDIA

3 LIBRARY USED :

PANDAS, NUMPY, SEABORN, MATPLOTLIB

4 GOOGLE COLAB