Project Report: Analyzing Historical Stock Prices and Forecasting

1.Introduction

This project aims to analyze the historical stock prices of a given stock symbol and perform a linear regres
The project utilizes the Alpha Vantage API to retrieve the necessary stock data and employs various data a
pandas, matplotlib, random,& scipy.

2. Data Retrieval and Preprocessing

The Alpha Vantage API is used to fetch the daily adjusted stock prices for the past 60 trading days.
The API response is obtained through a GET request using the provided API key and the stock symbol.
The JSON response is parsed to extract the relevant data, specifically the adjusted close prices.
The extracted data is stored in a pandas DataFrame for further analysis.

3. Data Analysis

The pandas DataFrame is used to calculate the average price and standard deviation of the adjusted close
Linear regression analysis is performed to determine the relationship between the trading days and adjuste
The slope, intercept, R-squared value, and other regression statistics are calculated using the scipy library
The results of the analysis, including the DataFrame, regression results, and R-squared value, are displaye

4. Visualization

The historical stock prices are plotted along with the regression line to visualize the trend.
The forecasted prices for the next 10 trading days are also plotted.
The plot includes axis labels, a title, and a legend for better interpretation.
The plot is saved as an image file named "stock_prices.png" for future reference.

5. Forecasting and Random Sequence

The forecasted stock prices for the next 10 trading days are printed.
A random sequence of integers is generated using the forecasted prices and the standard deviation.
The random sequence represents potential fluctuations in the stock prices based on the forecast.