**STOCK PRICE PREDICTION—ABSTRACT**

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Stock price prediction is a significant application in the field of financial data analysis and machine learning. This project focuses on predicting future stock prices using **Linear Regression**, a supervised learning algorithm. By utilizing historical stock price data—specifically the closing prices—this model attempts to forecast the stock value for a short range of future dates.

**Description of the Dataset**

The dataset used for this project is named **adaniports.csv**, which contains historical stock data of **Adani Ports** downloaded from Yahoo Finance. It includes features such as Date, Open, High, Low, Close, Adj Close, and Volume. For this project, only the Date and Close columns are used. The Date column is converted to datetime format and set as the index to support time series analysis, while the Close column serves as the main feature for training the model and predicting future prices.

**Algorithm Details**

The algorithm used for prediction is **Linear Regression**, which models the linear relationship between the current stock closing price and its future values. The data is split into training and testing sets using an 80:20 ratio. The model is trained using the training data and then evaluated on the test data. The approach assumes that future prices can be approximated as a linear function of past prices, which, while simple, provides a solid baseline for comparison with more complex models.

**Accuracy**

To evaluate the model’s performance, three metrics are used:

* **Mean Absolute Error (MAE)**: Measures average magnitude of errors without considering their direction.
* **Root Mean Squared Error (RMSE)**: Gives higher weight to larger errors.
* **R² Score**: Indicates the proportion of variance in the dependent variable that is predictable from the independent variable.

The Linear Regression model achieves moderate accuracy with an **R² Score typically between 0.6 and 0.9**, depending on the dataset size and stock volatility, suggesting a reasonable prediction capability for short-term trends.