STOCK PRICE PREDICTION

Unveiling Market Trends

TABLE OF CONTENTS

ABSTRACT

- Time series forecasting has been widely used to determine the future prices of stock, and the analysis and modelling of finance time series importantly guide investors' decisions and trades
- This work proposes an intelligent time series prediction system that uses sliding-window optimization for the purpose of predicting the stock prices
- The system has a graphical user interface and functions as a stand-alone application.
- The proposed model is a promising predictive technique for highly non-linear time series, whose patterns are difficult to capture by traditional models.

“ I never attempt to make money on the stock market. I buy on the assumption that they could close the market the next day and not reopen it for five years."

—WARREN BUFFETT

WHAT IS STOCKS?

Stock (also known as equity) is a security that represents the ownership of a fraction of a corporation. This entitles the owner of the stock to a proportion of the corporation's assets and profits equal to how much stock they own. Units of stock are called "shares." A stock is a general term used to describe the ownership certificates of any company. Stock prices change everyday by market forces.

IMPORTANCE OF STOCK PRICE PRIDICTION

- Informed Decision
- Risk Management
- Opportunity Identification
- Optimizing Portfolios
- Enhanced Performance
- Adaptability

CHALLENGES OF STOCK PRICE PRIDICTION

- Uncertainty and Speculation
- Risk of Losses
- Missed Opportunities
- Reactive Decision-Making
- Lack of Strategic Planning:
- Increased Emotional Influence

OBJECTIVE

The objective of the presentation is to provide a comprehensive exploration of various methods employed in stock price prediction. By the end of the session, the audience should gain a clear understanding of the data-driven approaches, machine learning models, technical indicators, and evaluation metrics utilized in predicting stock prices. The goal is to equip attendees with insights that enable informed decision-making in navigating the complexities of financial markets

METHODOLOGY

STATISTICAL METHODS

Statistical Methods

Simple Moving Average

Weighted Moving Average

Exponential Smoothing

Naïve Approach (Last Value Method)

MECHINE LEARING

Regression (Simple Linear, Lasso, Ridge)

K-Nearest Neighbour

Random Forest

Support Vector Machine (Support Vector Regression)

Neural Network Models (Single Layer Perceptron, Multilayer Perceptron, Long Short Term Memory)


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STOCK

```python
def analyze_stock(current_price, pe_ratio, debt_to_equity, roe, quick_ratio):
    """
    This function analyzes a stock based on various financial ratios and provides an estimated price and

    Args:
        current_price (float): The current price of the stock.
        pe_ratio (float): The price-to-earnings (PE) ratio of the company.
        debt_to_equity (float): The debt-to-equity (DE) ratio of the company.
        roe (float): The return on equity (ROE) of the company.
        quick_ratio (float): The quick ratio of the company.

    Returns:
        tuple: A tuple containing the estimated price and risk rating (low or high).
    """

    # Initialize estimated price change
    estimated_price_change = 0

    # Analyze PE ratio
    if pe_ratio > 25:
        estimated_price_change += 0.1  # 10% increase
    elif pe_ratio >= 15:
        estimated_price_change += 0.07  # 7% increase
    else:
        estimated_price_change += 0.01  # 1% increase

    # Analyze debt-to-equity ratio
    if debt_to_equity > 1:
        estimated_price_change += 0.1  # 10% increase
    elif debt_to_equity == 1:
        estimated_price_change += 0.07  # 7% increase
    else: to
        estimated_price_change += 0.01  # 1% increase

    # Analyze ROE
    if 15 <= roe < 20:
        estimated_price_change += 0.1  # 10% increase
    elif 20 <= roe < 30:
        estimated_price_change += 0.07  # 7% increase
    elif roe >= 30:
        estimated_price_change += 0.02  # 2% increase

    # Analyze quick ratio
    if quick_ratio > 1:
        estimated_price_change += 0.1  # 10% increase
    elif quick_ratio == 1:
        estimated_price_change += 0.06  # 6% increase
    else:
        estimated_price_change += 0.01  # 1% increase

    # Calculate estimated price
```

```python
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    else:
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    # Calculate estimated price
    estimated_price = current_price * (1 + estimated_price_change)

    # Determine risk rating
    if estimated_price_change > 0.1:
        risk_rating = "Low"
    else:
        risk_rating = "High"

    return estimated_price, risk_rating

# Get user input
current_price = float(input("Enter the current stock price: "))
pe_ratio = float(input("Enter the PE ratio: "))
debt_to_equity = float(input("Enter the debt-to-equity (DE) ratio: "))
roe = float(input("Enter the return on equity (ROE): "))
quick_ratio = float(input("Enter the quick ratio: "))

# Analyze the stock
estimated_price, risk_rating = analyze_stock(current_price, pe_ratio, debt_to_equity, roe, quick_ratio)

# Print the results
print("Estimated price:", estimated_price)
print("Risk rating:", risk_rating)
```
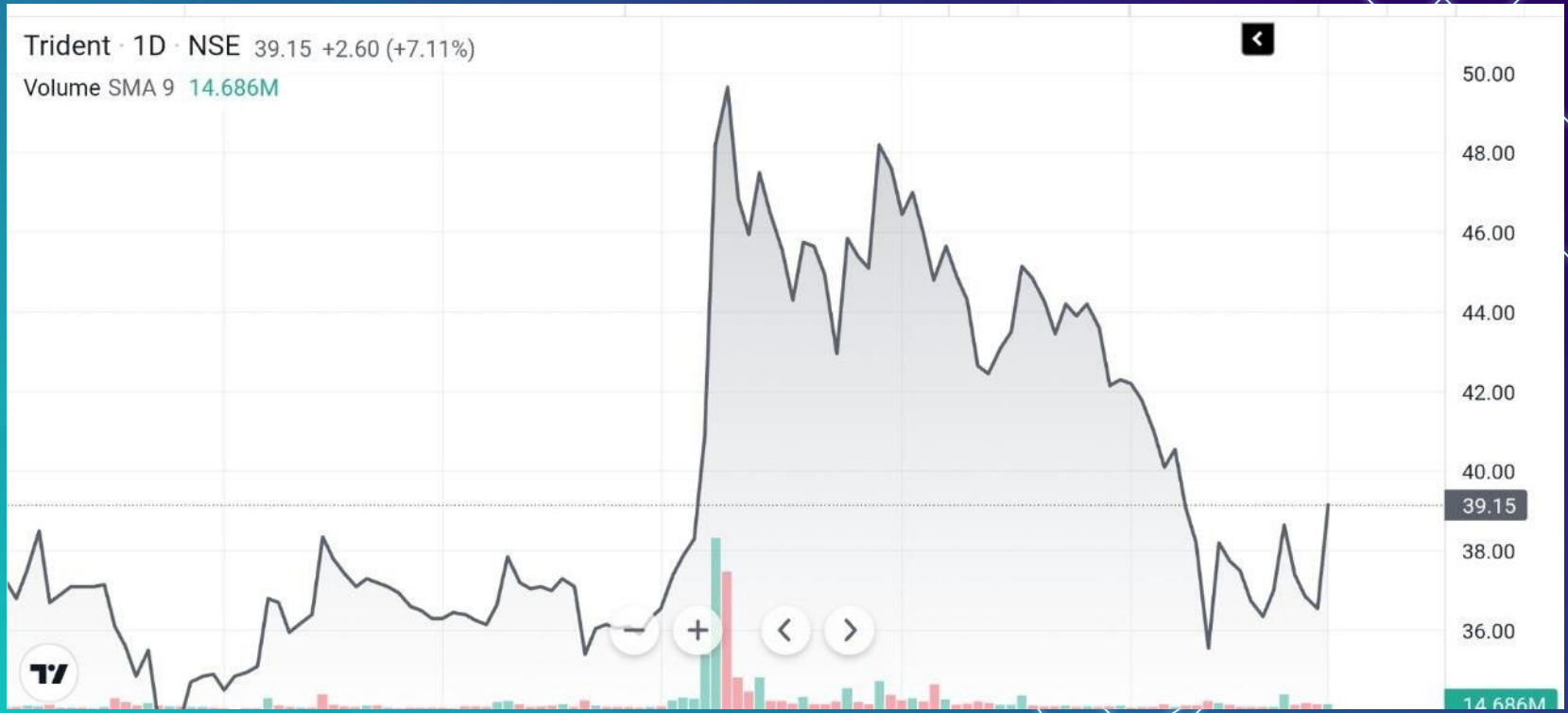

Output

```
Enter the current stock price: 39.30
Enter the PE ratio: 46.24
Enter the debt-to-equity (DE) ratio: 0.33
Enter the return on equity (ROE): 10.99
Enter the quick ratio: 0.64
Estimated price: 44.016
Risk rating: Low

=== Code Execution Successful ===
```


Trident · 1D · NSE 39.15 +2.60 (+7.11%)
Volume SMA 9 14.686M
50.00
48.00
46.00
44.00
42.00
40.00
39.15
38.00
36.00
14.686M

FUTURE WORK

Future work in stock price prediction involves exploring advanced machine learning algorithms, such as deep learning and reinforcement learning, to enhance predictive accuracy. Incorporating alternative data sources like social media sentiment analysis can provide nuanced insights into market behavior. Real-time data integration and adaptive learning mechanisms aim to make predictions more dynamic and responsive to evolving market conditions. Collaboration between financial experts and data scientists is key to refining models and developing innovative risk management strategies. Ongoing research into novel evaluation metrics and ethical considerations will contribute to the continual improvement and responsible application of stock price prediction methods

CONCLUSION

In conclusion, our exploration of stock price prediction has unveiled the crucial role of data-driven methodologies in empowering investors with insights for strategic decision-making. From understanding the challenges faced without predictive tools to decoding technical indicators and evaluation metrics, we have navigated the landscape of informed investing. The journey emphasized the importance of robust data collection, preprocessing, and the application of diverse prediction models. As we conclude, the dynamic nature of stock price prediction calls for continuous learning and adaptation to emerging trends, positioning investors to navigate the complexities of financial markets with confidence and foresight.

THANKS!

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