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INNOVATION PARTNER **I!2S**

ORGANIZED BY INDIA'S LEADING FINTECH FESTIVAL

FinTech
Festival India
3rd Edition

6-7-8 MARCH 2024
YASHOBHOOMI (IICC)
HALL - 1C, DWARKA, NEW DELHI



Team Name: **Stockonauts**

Problem Statement: **Real-time Market Insights & Algorithmic Trading Strategies**

Team Member Names:

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Idea Brief

Real-time Market Insights: Unleash AI algorithms that decode complex financial data in real-time, empowering FinTech companies and investors with precise market insights and predictions.

Algorithmic Trading Strategies: Master AI-powered algorithmic trading. Craft strategies that navigate market trends, optimizing portfolios for maximum returns and minimal risks

Our vision is to revolutionize financial insights by decoding complex data in real-time, empowering FinTechs and investors with intelligent tools. Three pillars guide our approach:

- Algorithmic Trading automates bank stock selection using AI analysis of NIM, NPA, P/E, and P/B ratios.
- Multifactor Market Dynamics tracks high-performing collaborations, digitalization impact, and economic trends across all sectors.
- Personalized Investment Insights predicts future stock prices and recommends tailored investments based on user preferences.

Our AI-powered analysis uncovers hidden patterns, providing a multidimensional perspective that considers comprehensive financial, digital, and economic factors using pre-trained LLMs (Large Language Models) .

Users receive tailored recommendations, actionable insights, and a sophisticated platform for navigating financial markets intelligently. Targeted towards FinTech companies and investors, our platform offers a revolutionary approach to decision-making in the dynamic landscape of financial markets.

Technologies Used

Programming Languages

- **Python**

Web Framework

- **Streamlit** – Used for building interactive Web Applications
- **React and Flask** - Under Development

Libraries and Frameworks

Data Analysis & Visualisation

Pandas, NumPy - Data manipulation & Numerical operation

Plotly, Matplotlib – Creating interactive plots & charts

TensorFlow or **PyTorch** - For building ML models to analyse market trends and make predictions

Machine Learning and Deep Learning Models & libraries

- **Prophet** – A forecasting tool used for predicting time series data
- **Scikit-learn** – Machine learning library for Data analysis & Modeling
- **Transformers** – Sentimental Analysis using pre-trained BERT Model – FinancialBERT
- **NLP pipeline** – Transformers from Hugging Face
- **Web Scrapping** – 'BeautifulSoup' used to Scrap news headlines

Database Storage

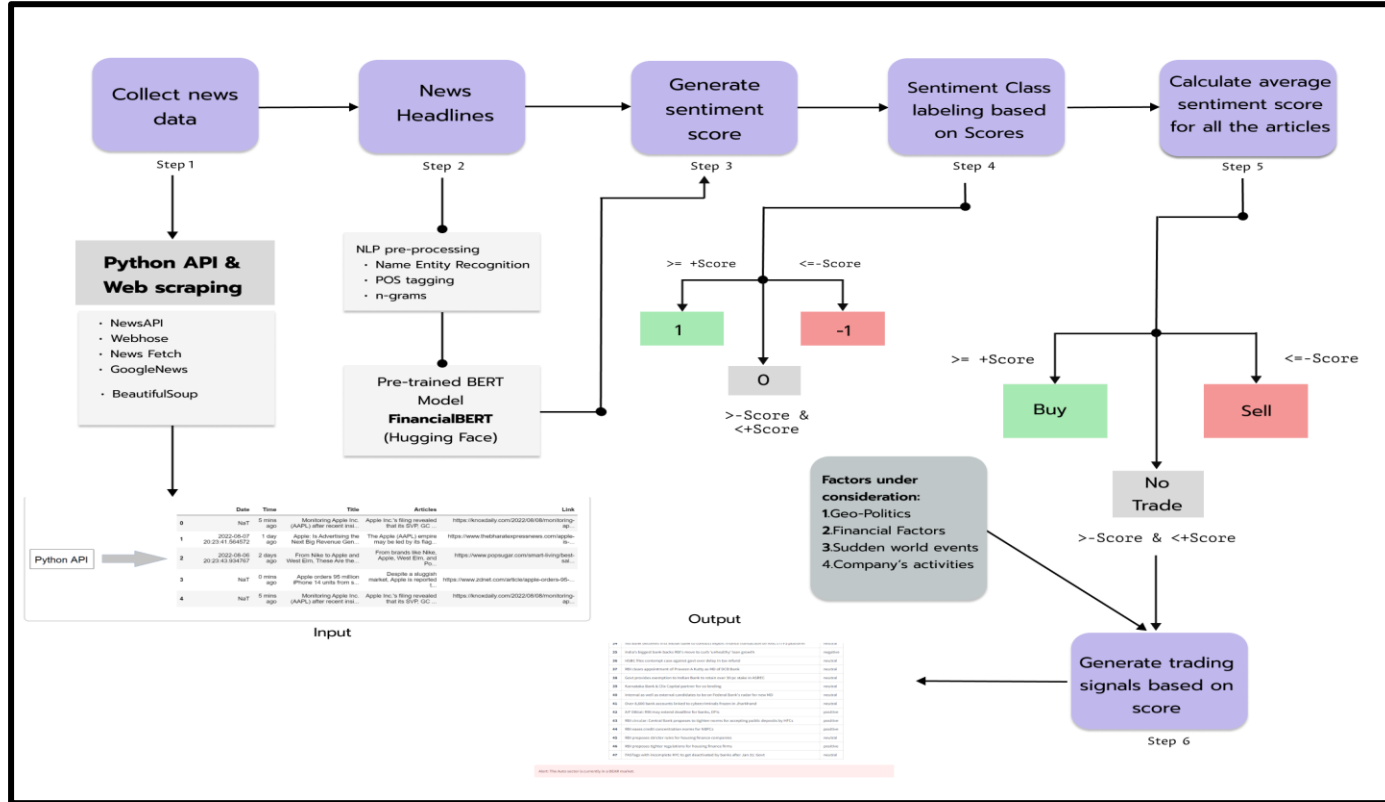
- **Relational databases** – Django(Development phase)
- **Data Feeds & APIs:** Replicate, News url data feed
- **Financial APIs** - Yahoo Finance API to access Market data & Company financials
- **News APIs** – NewsAPI

Version control

- Git & GitHub

Architecture Design

Algorithm1



Architecture Design

Algorithm 2 & 3

Algorithmic Trading

Using algorithms in buying and selling decisions in the financial market.



Programmer

Develop

Investing in Secondary Markets



Algorithms

Algorithmic Trading Engine

Database



Note

Please note that this is a high-level algorithm, and the specific thresholds for P/E ratios and scoring can be adjusted based on individual risk tolerance and investment objectives.

Integrated Adaptive Trading Algorithm (IATA)

- Higher Net Interest Margin (NIM)
- Lower Non-Performing Assets (NPA)
- $NIM - NPA > 0$ (Positive) - Financial robustness
- P/B (Price to Book Ratio) ratios under 1 are considered solid investments
- A high P/E (Price to Earnings) Ratio could mean that a stock's price is high relative to earnings and possibly overvalued.

The goal is to make investment decisions by considering the fundamental financial health of the bank.

Algorithm 2

```
momentum_score = 0
if NIM > 0:
    momentum_score += 1
if NPA < 0:
    momentum_score += 1
# Set a threshold based on your risk tolerance
if PE_ratio < threshold_PE:
    momentum_score += 1
if PB_ratio < 1:
    momentum_score += 1
if momentum_score > 0:
    return "buy_stocks"
else:
    return "sell_stocks"
```

Momentum investing

Buying stocks or other securities that have had high returns over a period, and selling those that have had poor returns over the same period.

How?

Momentum - Dual Moving Average Crossover of closing price

Algorithm 1

```
if momentum_score is +ve:
    result --> buy_stocks
else:
    result --> sell_stocks
```



EquiAlgo: Precision in Indian Equities Algorithmic Trading

Algorithm 3

- Calculate the Price-to-Earnings (P/E) ratio by dividing the stock price by earnings per share (EPS)
- If P/E is high, it may signal market optimism. Assign a positive score.
- If P/E is low, it may suggest undervaluation. Assign a positive score.
- Compare the company's P/E against the sector average.
 - If the company's P/E is high compared to the sector, and justified by strong performance, assign a positive score.
 - If the P/E is low compared to the sector, warrant investigation for potential undervaluation.
- Analyze macroeconomic trends (e.g., economic conditions, industry outlook).
- Assess micro-level factors (e.g., company fundamentals, competitive positioning, management quality).
- If the overall score is positive, consider it a signal to invest.
- Positive Collaboration and Degree of digitalization.
- Regularly reassess and adapt to changing market dynamics.



What positive and unique solutions your idea have?

Comprehensive Banking Sector Analysis:

- Focusing on Higher Net Interest Margin (NIM) and Lower Non-Performing Assets (NPA) provides a holistic view of a bank's financial health, emphasizing profitability and risk management.
- Integrating these specific banking metrics showcases a deep understanding of the sector, going beyond generic financial indicators.

Pricing and Earnings Analysis:

- Comparing both P/E Ratio and P/B Ratio gives a nuanced view of stock valuation, considering earnings and book value. This approach helps in making more informed investment decisions.
- Emphasizing the importance of both ratios and guiding investors on when a P/B ratio under 1 is considered solid adds practical insights to the analysis.

Multifactor Market Dynamics:

- Analyzing collaborative approaches across diverse sectors and the impact of digitalization on stock values demonstrates a forward-thinking strategy. How efficiently bank make use of UPI and other digitalized platforms reflects on the stock value.
- Specifically exploring collaborations in autonomous driving tech, healthcare tech, and fintech collaborations adds specificity and depth to the analysis.

NLP - Sentiment Analysis:

- Incorporating sentiment analysis through Natural Language Processing (NLP) techniques on news articles provides a real-time measure of market sentiment. It enhances the forecasting taking into considerations various geo-political and economic factors.
- Scraping articles from a reputable source like the Economic Times adds credibility and enhances data collection efficiency.

Personalized Investment Insights:

- Tailoring investment strategies based on user preferences and utilizing the Prophet time-series forecasting model for predictions adds a personalized touch. Integrating a language model to generate a phrase recommending a selected bank for investment enhances user engagement and provides actionable insights.

Holistic Economic Analysis:

- Incorporating both micro and macroeconomic factors for analysis provides a comprehensive understanding of market dynamics. Addressing specific factors like pricing strategies, market competition at the micro level, and examining broader indicators like GDP and unemployment rates at the macro level offers a well-rounded approach.

GitHub & Demo Video Links

GitHub Repository Link	https://github.com/Karthick-ng/Real-Time-Market-Insights.git
Prototype Demo Video Link	https://youtu.be/Q05lviXkE5M?si=GcIcwYjXxaxEQnIb

Summary

Approach:

- **Algorithmic Trading:** Automate stock selection with NIM, NPA, P/E, P/B ratios.
- **Market Dynamics:** Track collaborations, digital trends, economic shifts.
- **Personalized Insights:** Predict stock prices based on user preferences.
- **AI Analysis:** Uncover hidden patterns with pre-trained LLMs.

Conclusion:

- AI-driven platform for FinTechs, investors.
- Users receive personalized recommendations, actionable insights, and a sophisticated platform for intelligent financial decision-making.

New Innovations:

- **Banking Sector Analysis:** Holistic view with NIM and NPA.
- **Pricing and Earnings:** Nuanced stock valuation with P/E, P/B ratios.
- **Market Dynamics:** Analyze collaborations, digital impact for forward-thinking strategies.
- **NLP - Sentiment Analysis:** Real-time market sentiment through NLP.
- **Personalized Insights:** Tailor investment strategies based on user preferences.
- **Holistic Economic Analysis:** Micro and macroeconomic factors for comprehensive understanding.

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THANK YOU

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