GIET UNIVERSITY JOURNAL, 2023, VOL.3, NO.1, PP. – 22-26

Manuscript Received 8th December 2023; Revised 21st December 2023; Accepted 2nd January 2024

CUSTOMISED ALGORITHMIC TRADING PLATFORM

Ankit Choudhury , Department of CSE, GIET University, 21cseaiml035.arijeetmishra@giet.edu
Arijeet Mishra, Department of CSE, GIET University, 21cseaiml008.arijeetmishra@giet.edu
Bidush Kumar Sahoo , Department of CSE, GIET University, bidushsahoo@giet.edu
Raghvendra Kumar, Department of CSE, GIET University, raghvendra@giet.edu

Abstract:
Intraday trading poses challenges for individuals seeking efficient decision-making amidst market dynamics. This article explores the development of a groundbreaking algorithmic trading platform, integrating machine learning models and real-time data fetching. Tailored for college students and professionals, the platform empowers users to design and optimize trading algorithms with ease. The project unfolds in two phases: classical machine learning models and advanced techniques like ARIMA and deep learning. Offering granular customization, robust back testing, and live testing integration with an Indian brokerage, the platform stands out for its versatility. Comparative analysis highlights its unique emphasis on user-defined algorithms and the incorporation of diverse machine-learning models, setting it apart from specialized solutions. The project signifies a leap forward in simplifying intraday trading, presenting a comprehensive, customizable, and practical solution for strategic decision-making in dynamic market environments.

Key words: ARIMA, trading platform, granular customization, robust back testing

1. Introduction:

This article delves into the creation of an innovative algorithmic trading platform designed to make trading accessible and efficient. Intraday trading is a dynamic and time-consuming endeavor, posing challenges for individuals with limited time resources. The introduced algorithmic trading platform seeks to bridge this gap by the power of machine learning models. The overarching goal is to create a customizable and user-friendly solution that allows individuals to define, test, and optimize their trading algorithms on historical data.

2. Related Work:

While the landscape of algorithmic trading is populated with various platforms, this project stands out due to its unique customization capabilities and the integration of machine learning models for decision-making [1]. Previous works have explored the intersection of machine learning and trading, but this project distinguishes itself by offering a more accessible interface and the ability to comprehensively backtest trading strategies [2].

3. Proposed Methodology:

The project unfolds in two distinctive phases. In Phase 1, classical machine learning models such as Linear Regression, Logistic Regression, and Decision Tree Classifier take center stage. Phase 2 introduces advanced techniques, including the integration of the ARIMA model for trend

Manuscript Received 8th December 2023; Revised 21st December 2023; Accepted 2nd January 2024

analysis and deep learning models like Perceptron and LSTM [3,4]. User-defined algorithms guide the labeling and training of historical datasets, offering a personalized touch to the trading strategies.

4. Comparison with Other models:

In a comparative analysis with other articles in the domain, this project distinguishes itself through its emphasis on customization and user-defined algorithms. While some articles may focus on specific strategies or models, the proposed platform accommodates a broad spectrum of approaches. The integration of both classical and advanced machine learning models adds a layer of versatility, setting it apart from more specialized solutions.

1. KNN Model [k=11]:

```
k-Nearest Neighbour can capture complex patterns in the data without
assuming a specific underlying model.

Accuracy: 0.321011673151751

Classification Report:

              precision    recall  f1-score   support

          -1       0.30      0.27      0.28       139
           0       0.35      0.42      0.38       194
           1       0.30      0.26      0.28       181

    accuracy                           0.32       514
   macro avg       0.31      0.31      0.31       514
weighted avg       0.32      0.32      0.32       514


Confusion Matrix:
[[37 60 42]
 [43 81 70]
 [44 90 47]]

KNN may not be the first choice for all stock price prediction tasks
```

2.LR Model

Manuscript Received 8th December 2023; Revised 21st December 2023; Accepted 2nd January 2024

```
Though this values are not promising but with proper coding techniques it
can be useful since our goal is to beat that 51% base prediction and given
68% accuracy we have improved over 17%

Accuracy: 0.6867704280155642

Classification Report:
              precision    recall  f1-score   support

          -1       0.78      0.62      0.69       139
           0       0.58      0.64      0.61       194
           1       0.76      0.78      0.77       181

    accuracy                           0.69       514
   macro avg       0.71      0.68      0.69       514
weighted avg       0.70      0.69      0.69       514


Confusion Matrix:
[[ 86  53   0]
 [ 24 125  45]
 [  0  39 142]]
```

3.SVC Model

```
Support Vector Machine (SVM) is a powerful classification algorithm
commonly used in machine learning. SVM, in this context, is more commonly
used for classification tasks related to stocks, such as predicting
whether the stock will go up or down.

Accuracy: 0.6614785992217899

Classification Report:
              precision    recall  f1-score   support

          -1       0.67      0.65      0.66       139
           0       0.56      0.59      0.57       194
           1       0.78      0.75      0.76       181

    accuracy                           0.66       514
   macro avg       0.67      0.66      0.67       514
weighted avg       0.67      0.66      0.66       514


Confusion Matrix:
[[ 91  48   0]
 [ 42 114  38]
 [  3  43 135]]
```

Manuscript Received 8th December 2023; Revised 21st December 2023; Accepted 2nd January 2024

5. Discussion:

The project's standout feature lies in its flexibility and the incorporation of diverse machine learning models. User-defined algorithms empower individuals to tailor strategies according to their unique preferences, risk tolerance, and market outlook. The backtesting functionality emerges as a crucial component, allowing users to simulate the performance of their algorithms on historical data, providing invaluable insights into potential strengths and weaknesses.

6. Advantages and Uniqueness:

Granular Customization: Users have unparalleled freedom to define their trading algorithms based on individual preferences, risk appetite, and market outlook.

Robust Backtesting: The platform provides a robust backtesting feature, enabling users to evaluate the historical performance of their algorithms under various market conditions, and enhancing strategic refinement.

Live Testing Integration: Live testing with an Indian brokerage, supporting both Paper Money and Real Money trading, elevates the practicality and applicability of the platform to real-world scenarios.

Diverse Machine Learning Models: Incorporating classical and advanced machine learning models enhances the platform's predictive capabilities, enabling more nuanced and accurate decision-making.

7. Conclusion:

In conclusion, the project represents a significant leap forward in streamlining intraday trading for individuals with limited time. By synergizing user-defined algorithms with a diverse array of machine learning models, the platform offers a unique and versatile solution. The emphasis on customization, comprehensive backtesting, and integration with live trading scenarios positions the project as an indispensable tool for those seeking to optimize their trading strategies. As the project evolves, continuous refinement and user feedback will contribute to its effectiveness in navigating the ever-changing landscape of algorithmic trading.

8. Reference

1. Bhat, A.A. and Kamath, S.S., 2023, July. Automated stock price prediction and trading framework for Nifty intraday trading. In 2023 Fourth International Conference on Computing, Communications and Networking Technologies (ICCCNT) (pp.1-6). IEEE.
2. Bonde, G. and Khaled, R., 2022. Stock price prediction using genetic algorithms and evolution strategies. In Proceedings of the International Conference on Genetic and Evolutionary Methods (GEM) (p. 1). The Steering Committee of The World Congress in Computer Science, Computer Engineering and Applied Computing

Manuscript Received 8th December 2023; Revised 21st December 2023; Accepted 2nd January 2024

(WorldComp).
3. Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems Book by Geron Aurelien
4. Investopedia Website: https://www.investopedia.com