

Data Analysis of Stock Market

Equity Insight Trends Explorer

Submitted By

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DESCRIPTION

Analyzing Stock Market Live Trade Matrix Data is a way of examining the nature of the response variable in relation to time used as an independent one. In the case of data analysis for prediction or forecasting, we use time as a target variable. Some real-life examples of Time Series Analysis (TSA) are weather forecasting models, stock market predictions, signal processing and control systems. In this project we will study the patterns in world-wide market cap index stock market data to understand financial indicators and trends.

The Hang Seng Index is important in determining world's index overall stock market performance and it fluctuates depending on the global economic fluctuations. It shows information about share prices, trading volumes and other financial indicators which are essential for investors and analysts too.

OBJECTIVE

By analysing the activities and behaviour of the HSI stock market, we aim to identify problems and loopholes in financial forecasting, trading volumes, investor preferences, and market fluctuations. Revenue management can be optimized by accurately predicting demand fluctuations over time. Additionally, TSA can help in optimizing operational efficiency by forecasting trading schedules, maintenance of trading platforms, and understanding historical data patterns. We can also use time series models to predict and mitigate potential causes of market volatility, such as economic news, political events, and other external factors.

METHODOLOGY

To dissect and interpret these variables, we employed a comprehensive suite of analytic methods:

1. Data Collection

Subscribe to reliable real-time data feed providers and use APIs to gather livestock market data, including prices, volumes, and trade times.

2. Data Preprocessing

Clean and normalize the collected data to handle missing values, outliers, and ensure consistency, then store it in a structured format.

3. Live Trade Matrix Construction

Initialize and continuously update a matrix where rows represent stocks and columns represent time intervals, maintaining a fixed time horizon for analysis.

4. Feature Extraction

Calculate technical indicators, statistical features, and identify volume and price patterns from the data in the matrix to derive meaningful insights.

5. Data Analysis

Perform descriptive statistics, create visualizations, and analyze correlations to understand trends and patterns in the stock market data.

6. Model Building

Select appropriate algorithms, train and test models using historical data, and optimize parameters to predict market movements and generate trading signals.

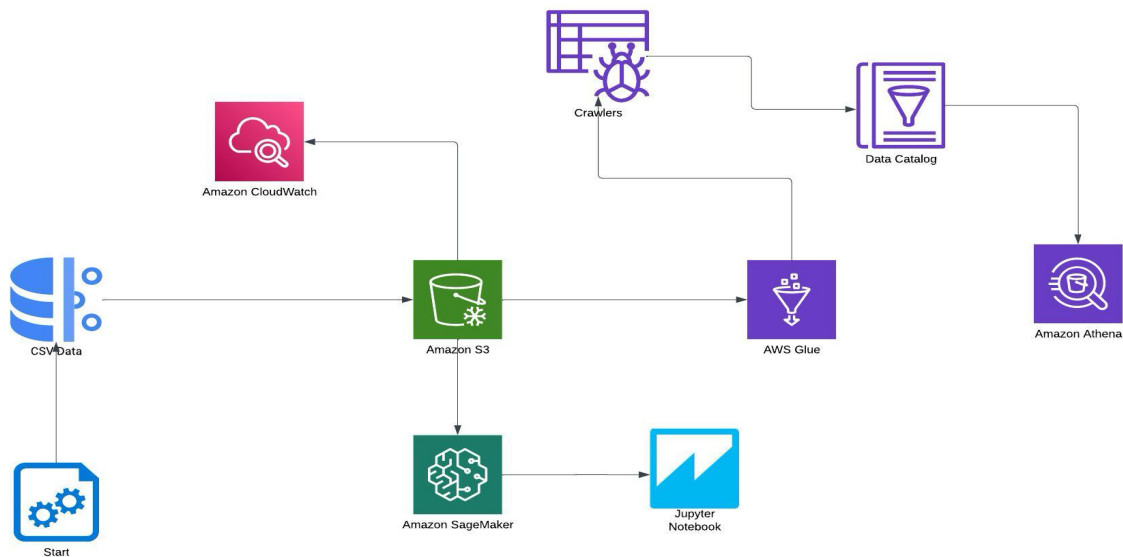
7. Real-Time Analysis and Decision Making

Use models to generate trading signals and alerts in real-time and implement automated trading strategies if applicable for executing trades.

8. Performance Evaluation and Optimization

Continuously monitor and evaluate the performance of trading strategies using metrics like Sharpe ratio and drawdown, and refine models and strategies based on feedback.

ARCHITECTURE OF DATA ANALYSIS



Technology used: Programming Language – Python

Amazon Web Service (AWS), S3 (Simple Storage Service)

Athena, Glue Crawler, Glue Catalog, Lambda, CloudWatch, SageMaker, Jupyter Notebook.

EXPECTED RESULT

The expected result of data analysis of the stock market using a live trade matrix is to gain actionable insights into market trends and stock performance. This analysis aims to generate accurate trading signals and predictions, enabling traders to make informed buy or sell decisions in real-time. By leveraging technical indicators, statistical features, and pattern recognition, the live trade matrix helps identify profitable trading opportunities, optimize trading strategies, and minimize risks. Overall, it enhances the decision-making process, improves trading efficiency, and aims to achieve higher returns on investments while maintaining a balanced risk-reward ratio.

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