

Analysis of the Stock Market

Group member:
XXX

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CONCENTS



PART 01

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Introduction

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Introduction

Stock market analysis is essential in finance, offering insights into financial markets and impacting the economy. Various perspectives exist:



- ◆ Fundamental analysis examines financial statements and economic factors to identify undervalued stocks (Graham, 1949).
- ◆ Technical analysis uses patterns and indicators for immediate decisions.
- ◆ The efficient market hypothesis advocates passive investing (Murphy, 1999).
- ◆ Data-driven procedures offer reliable analysis (DeFusco et al., 2007).
- ◆ A shift towards cost-effective, passive investment strategies is evident (Bogle, 2017).

PART 02

D a t a

- Data Gathering
- Data Cleaning
- Exploratory Data Analysis

Data Gathering



01

Macroeconomic Factors

These are the main forces and indicators that collectively influence the overall state and performance of an economy.

02

S&P 500 Index

A market-capitalization-weighted index that includes 500 of the largest publicly traded American companies listed on the New York Stock Exchange and NASDAQ.

03

Findings help investors and policymakers make informed decisions based on economic and market data.

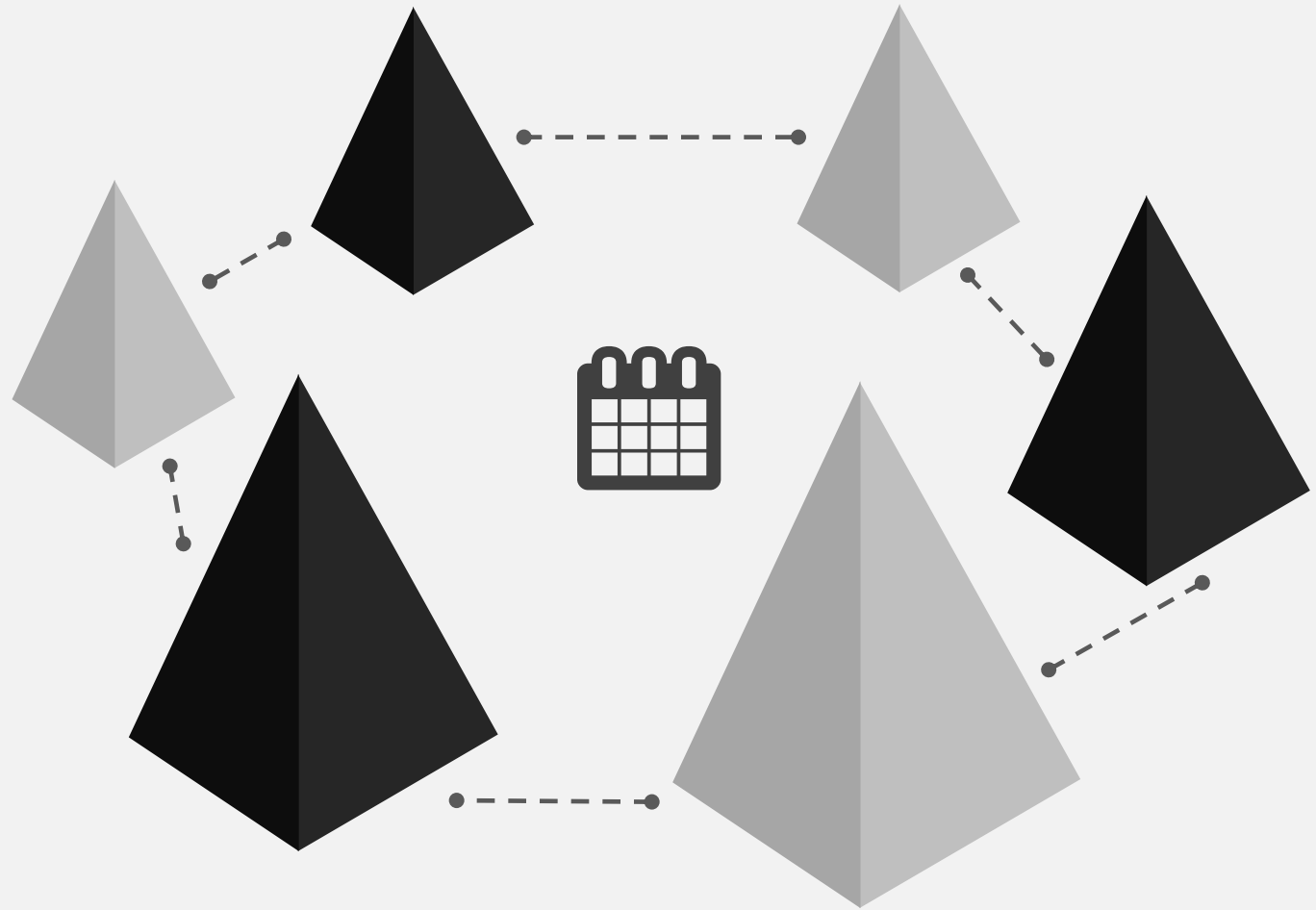
Data Cleaning

Using Python Tools

- Optimizing data structure and quality using Pandas and Numpy.

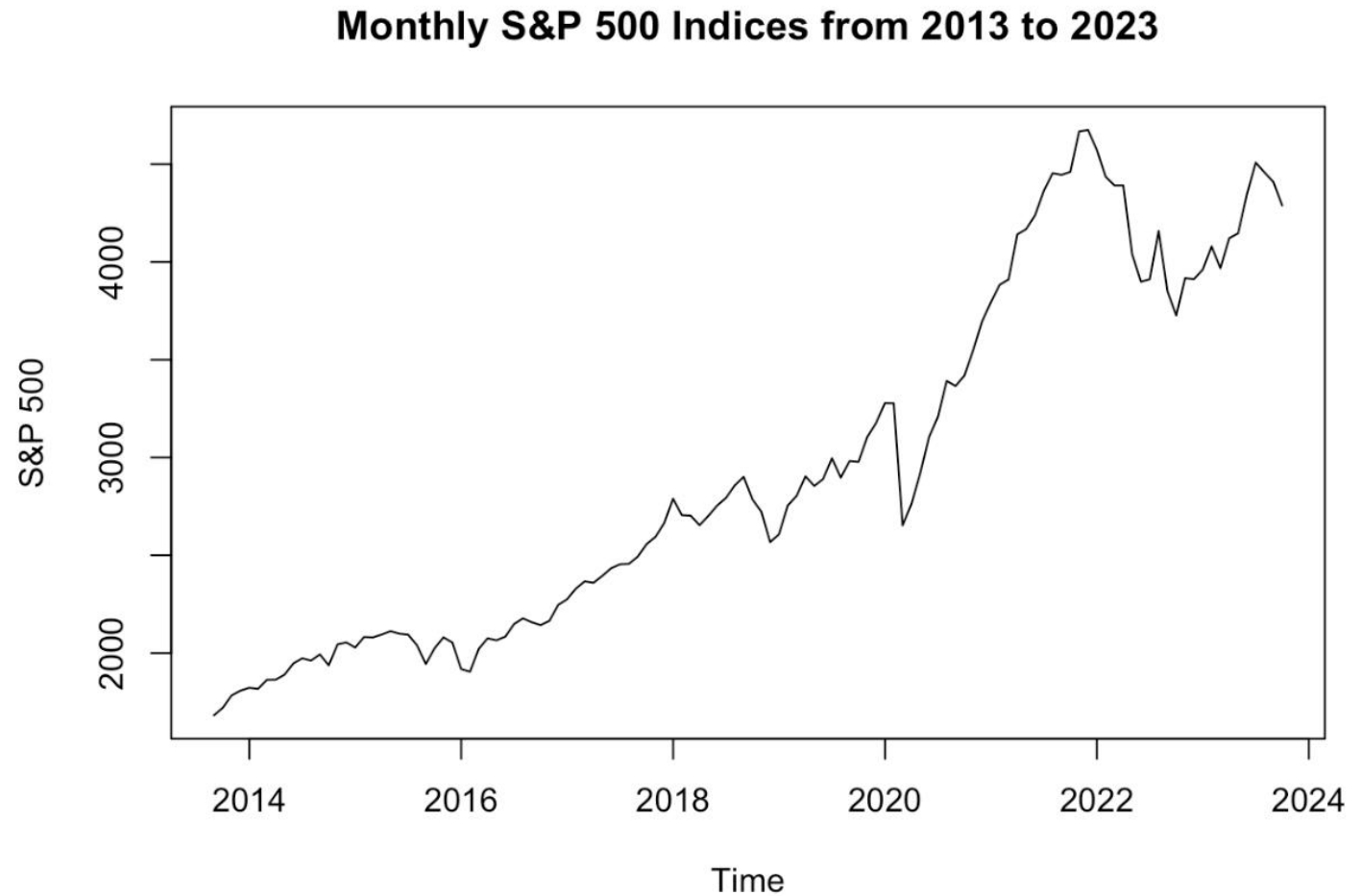
Text Data Cleaning

- Applying regex and CountVectorizer for cleaning and vectorizing text data.

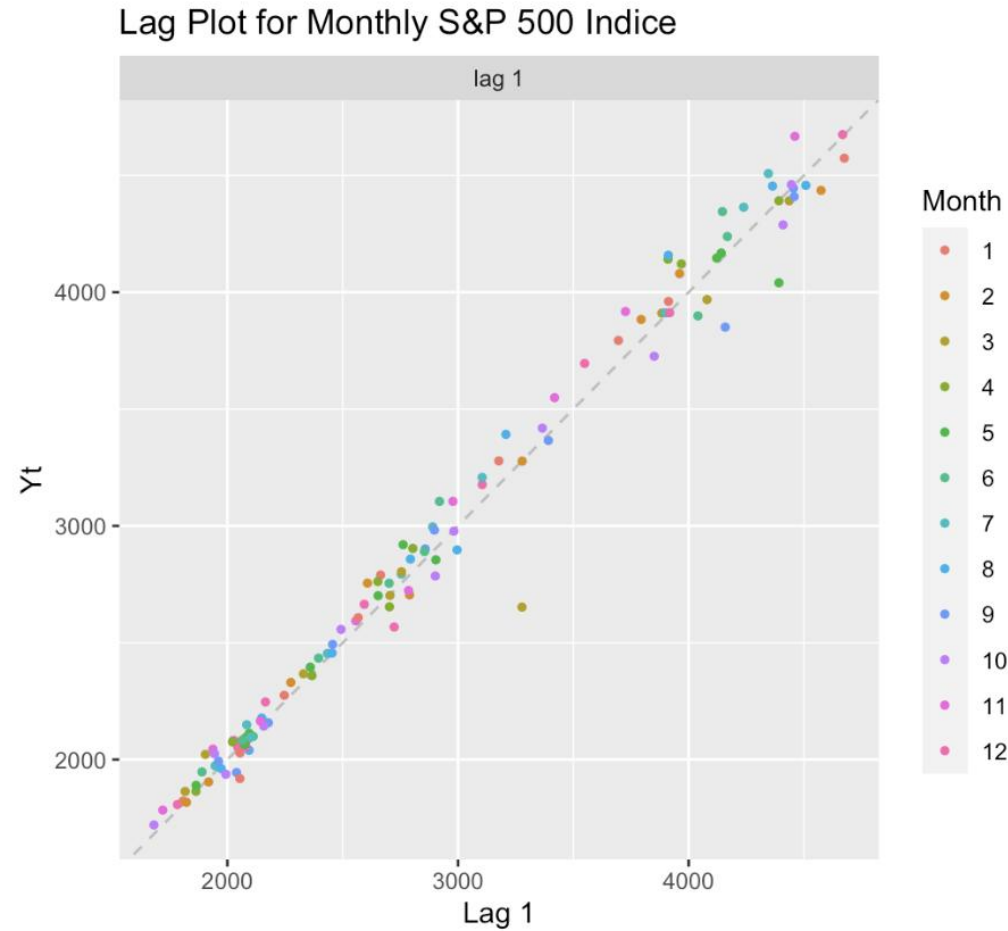


Exploratory Data Analysis

**Data
Visualization**
Analyzing trends and
seasonality in S&P 500
index.



Exploratory Data Analysis



Correlation Analysis

Revealing relationships between top-tier companies' stock prices and market indices, and the impact of economic events.

PART 03

M o d e l

- Naïve Bayes
- Clustering
- Dimensionality Reduction
- Random Forests

Naïve Bayes

Text Classification for Video

Streaming Platforms

Training accuracy: 48.05%.

Test accuracy: 41.10%.

**indicating need for
improved generalization.**

01



02

Stock Market Data

Classification

- **classifying financial data of major players like Disney, Paramount, and Warner Brothers.**
- **Test set accuracy: 53.62%.
showing predictive capability with room for optimization.**

Clustering

Employing K-means,
hierarchical
clustering, DBSCAN,
BIRCH, and MeanShift
algorithms.



**Detailed Clustering
Analysis of Stock
Market Data**

K-means with a
silhouette score of
0.65 for three
clusters,
indicating high
clustering quality.

Dimensionality Reduction



01

Principal Component Analysis (PCA) and t-Distributed Stochastic Neighbor Embedding (t-SNE)

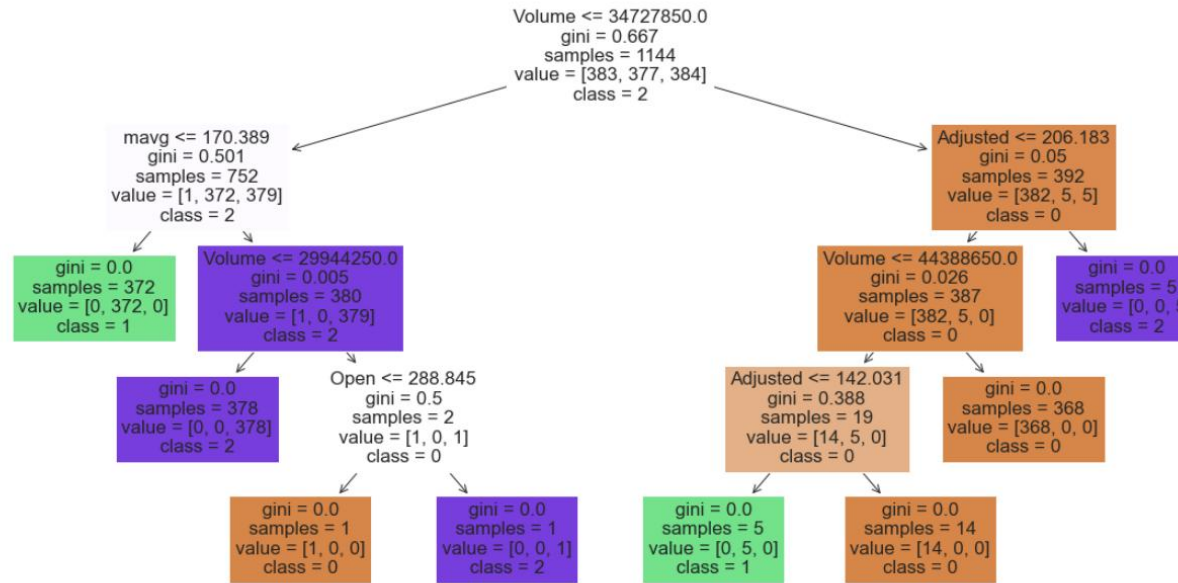
02

PCA accounted for nearly 99% of the data variance, highlighting main trends.

03

t-SNE emphasized local structures, forming distinct clusters.

Random Forests



Classification Predictions for
Multidimensional Stock
Market Data using Decision
Tree



Training precision of 100%
and test precision of 99.3%,
showing stable
generalization capability.



Visualization of the model
structure aids in understanding
the decision-making process.



PART 04

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C o n c l u s i o n

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Conclusion

1

Methods

Combining fundamental and technical analysis with Naive Bayes, clustering, dimensionality reduction, and random forests.

2

Macroeconomic Impact

Significant impact of macroeconomic factors on stock performance, data integration enhances prediction accuracy.

3

Decision Support

Findings help investors and policymakers make informed decisions based on economic and market data.

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THANKS

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