Stock Market Analysis Report: NIFTY 50 & SENSEX

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Course: B.Tech CSE (AI & ML)
Project Type: Python-Based Financial Data Analysis
Market: BSE & NSE

1. Introduction

The Indian stock market plays a crucial role in the country's economic growth. Two of its most important benchmark indices are NIFTY 50 and SENSEX. This project focuses on analyzing these indices using Python to understand market returns, volatility, trends, and long-term investment behavior.

2. Objectives of the Project

- Analyze historical performance of NIFTY 50 and SENSEX
- Calculate daily returns and volatility
- Apply moving averages to identify trends
- Visualize data for better investment insights

3. Data Source

The historical market data was collected using the Yahoo Finance API via the yfinance Python library. Daily price data from 2019 to 2025 was used.

4. Tools & Technologies Used

- Python
- Pandas & NumPy (Data Analysis)
- Matplotlib (Visualization)
- yFinance (Market Data)

5. Methodology

1. Download historical index data
2. Clean and preprocess the data
3. Calculate daily returns
4. Measure volatility using standard deviation
5. Compute 50-day and 200-day moving averages
6. Visualize trends and comparative insights

6. Analysis & Observations

• Daily returns indicate short-term market fluctuations.
• Volatility analysis helps in understanding market risk.
• Moving averages smooth price data and identify long-term trends.
• Cumulative returns show growth of long-term investments.

7. Visual Insights

The project includes:
- Price trend charts with moving averages
- Volatility comparison bar chart
- Cumulative return comparison line chart

8. Conclusion

The analysis shows that both NIFTY 50 and SENSEX follow similar long-term trends, with periods of high volatility during market uncertainty. Moving averages provide strong indicators of market direction. This project demonstrates how Python can be effectively used for financial analysis.

9. Future Scope

- Add technical indicators like RSI and MACD
- Analyze individual NIFTY 50 stocks
- Apply machine learning models for trend prediction
- Portfolio optimization

10. References

- Yahoo Finance
- NSE & BSE India
- Python Documentation