Stock Analysis Dashboard

1. Project Overview

This project implements a stock analysis and prediction system that leverages financial data from Yahoo Finance (yfinance) to perform in-depth analysis. It integrates technical indicators, machine learning signals, comparison tools, and back testing to provide insights into stock performance. This is to make it much more easier for investors during investment and it is beginner friendly analysis.

The system allows a user to:

- Input a stock ticker (e.g., AAPL, MSFT, MA).
- Download historical data (2020–2025).
- Perform trend visualization using candlestick charts.
- Apply technical indicators (SMA, EMA, RSI, MACD).
- Compare multiple stocks.
- Backtest simple trading strategies.
- Integrate ML-driven prediction signals.

2. Data Collection

- Source: Yahoo Finance (yfinance).
- Dataset: Daily OHLCV data (Open, High, Low, Close, Volume) from 2020-01-01 to 2025-01-01.
- Cleaning: Ensures numeric consistency, handles missing values, and standardizes columns.

3. Technical Analysis

The system computes key financial indicators:

- SMA (Simple Moving Average): Identifies long-term trends.
- EMA (Exponential Moving Average): Detects short-term momentum.
- RSI (Relative Strength Index): Highlights overbought/oversold conditions.
- MACD (Moving Average Convergence Divergence): Tracks bullish/bearish momentum shifts.

Graphs and overlays allow investors to visually interpret trends.

4. Deep Analysis & Ideas Integrated

✔ **Trend Detection:** Candlestick + SMA/EMA overlays to see trend reversals.
✔ **ML Signals (Future Idea):** Logistic Regression or LSTM can be integrated to predict price movement (Up/Down).
✔ **Comparison Tool:** Compare performance of multiple tickers (e.g., AAPL vs MSFT).
✔ **Backtesting Module:** Tests strategies (e.g., Buy when SMA50 > SMA200).

✔ **Risk Analysis:** Volatility measurement using standard deviation & returns distribution.
✔ **Profit Estimation:** Backtest returns compared against Buy-and-Hold.
✔ **Visualization:** Interactive charts with matplotlib/plotly.

5. Sample Outputs (from tests on MA – MasterCard)

- Data successfully fetched (2020–2025).
- Cleaned Close price series plotted with moving averages.
- Indicators (SMA50, SMA200, RSI, MACD) calculated.
- Strategy backtest ready to evaluate trading logic.

6. Future Enhancements

- Add LSTM-based time series prediction.
- Deploy as a web dashboard (Streamlit/Flask).
- Export results as PDF/Excel reports.
- Integrate real-time data for live signals.

7. Conclusion

This project provides a robust foundation for financial data analysis. It combines technical indicators, strategy testing, and predictive modeling concepts, making it a comprehensive stock research tool for traders, students, and analysts.In overall view this analysis can be used to see not only the complete analysis of the particular stock but also to ensure the investors whether they have chosen the correct stock among all the stocks available in 2025.