

**TITLE:** SMARTSTOCK SCREENER AND RECOMMENDATION SYSTEM

**PRESENTED BY:** RUDRO KANTO DE

**INSTITUTE:** MEGHNAD SAHA INSTITUTE OF TECHNOLOGY

**YEAR:** 4<sup>th</sup>

**DURATION:** 01-03-2025 TO 03-10-2025

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## **PROBLEM STATEMENT:**

Stock market analysis often requires juggling multiple tools: data sources, charting platforms, and manual screening. Beginners find this overwhelming, while advanced users struggle with repetitive workflows.

This project addresses the problem by:

- Providing a single integrated platform for candlestick analysis and recommendations using EOD data.
- Automating repetitive tasks like fetching daily OHLC data, filtering recommendations, and exporting results.
- Offering a clean, intuitive GUI that lowers the barrier to entry for technical analysis.

The goal is to make stock screening accessible, automated, and visually clear, while showcasing robust software engineering practices.

## **ABSTRACT AND PURPOSE:**

This project is a comprehensive desktop application developed to assist retail investors, students, and aspiring analysts in examining stock market behaviour using End-of-Day (EOD) data. Unlike real-time trading platforms, the focus here is on daily OHLC (Open, High, Low, Close) values, which are widely used in technical analysis to identify patterns and trends. The application integrates multiple functionalities — candlestick pattern recognition, stock screening, and recommendation generation — into a single, unified interface. By leveraging Yahoo Finance as the data source, the system ensures reliability and accessibility of market information. Visualization is achieved through Matplotlib and mplfinance, enabling clear and professional candlestick charts. The user interface is built with Tkinter, providing an intuitive, interactive environment where users can navigate seamlessly between modules such as the homepage, screener, recommendations, and market overview. Together, these components create a tool that bridges the gap between raw financial data and actionable insights.

The primary purpose of the project is to simplify technical analysis for beginners while also offering advanced features for more experienced users. Many retail investors struggle with fragmented tools and complex workflows; this application addresses that challenge by consolidating essential analysis techniques into one platform. Features such as multi-timeframe candlestick charting (daily and weekly), automated detection of key patterns (Doji, Engulfing, Insider Candle, Gap Up/Down), and recommendation generation make the system both educational and practical. The modular design ensures scalability, allowing new patterns or data sources to be added without disrupting existing functionality. The outcome is a robust, placement-ready project that demonstrates technical depth in data handling, visualization, and GUI development, while also showcasing practical usability. For academic evaluation and campus placements, the project highlights not only programming skills but also the ability to design a system that is strategic, user-friendly, and impactful in real-world financial contexts.

## **SYSTEM DESIGN:**

The system is designed using a modular architecture, ensuring clarity, scalability, and ease of maintenance. Each module performs a distinct function but integrates seamlessly with the others to provide a unified analytical platform.

- ❖ **Homepage Module**
  - Serves as the entry point of the application.
  - Displays charts based on daily OHLC data.
  - Implements chart refresh and navigation logic, ensuring smooth transitions to other modules.
- ❖ **ScreeNer Module**
  - Enables stock filtering and exploration based on various candlestick patterns
  - Helps users narrow down large stock datasets to focus on stocks that meet specific conditions.
  - Acts as a bridge between raw data and recommendations, giving users control over what subset of stocks to analyse.
- ❖ **ReCommendation Module**
  - Implements candlestick pattern recognition algorithms (Doji, Engulfing, Insider Candle, Gap Up/Down).
  - Generates actionable signals such as Buy, Sell or Watch based on End of Day data.
  - Displays results in a Treeview table with colour coded tags for easier interpretation.
  - Allows users to filter recommendations and export them to CSV format for further analysis.
- ❖ **Market Overview Module**
  - Implements a treeview table with colour coded tags for gainers, losers and also returns the output for volume shockers.
  - Helps us understand the top gainers and losers of stocks in a particular order and helps us analyse further.
- ❖ **Settings**
  - Offers customization options for user preferences

## **TECHNOLOGIES USED:**

- ❖ Python:
  - Python serves as the foundation of the project, providing simplicity, readability, and a vast ecosystem of libraries.
  - Its versatility allows seamless integration of data handling, visualization, and GUI development.
  - Python's modular structure ensures that each component (pattern detection, charting, recommendations) can be developed and maintained independently.
- ❖ Tkinter
  - Tkinter is used to design the desktop interface of the application.
  - It provides interactive elements such as buttons, frames, menus, and tables (Treeview), enabling smooth navigation between modules.
  - The GUI ensures that complex stock analysis is presented in a clear and accessible format, making the tool beginner-friendly while still powerful for advanced users.
  - Tkinter's flexibility allows integration with charts and data tables, creating a cohesive user experience.
- ❖ Matplotlib & mplfinance
  - Matplotlib is employed for general plotting and embedding charts into the Tkinter interface.
  - mplfinance, a specialized extension of Matplotlib, is used to generate candlestick charts and other financial visualizations.
- ❖ Pandas
  - Pandas is the backbone for data manipulation and preprocessing.
  - It handles tasks such as reading CSV files, cleaning datasets, filtering values, calculating weekly highs/lows, and exporting results.
  - Pandas' DataFrame structure makes it easy to manage large volumes of stock data efficiently.
- ❖ yfinance
  - yfinance is used to fetch End-of-Day (EOD) OHLC (Open High Low Close) data directly from Yahoo Finance.
  - It provides reliable access to historical and current daily stock prices, including open, high, low, close, and volume.
  - This ensures that the system always works with authentic market data, eliminating the need for manual data entry.

## **WORKFLOW:**

The workflow begins with user navigation through a sidebar menu, leading to the homepage where daily OHLC data is visualized in candlestick charts. From there, users can access the recommendation module, which applies candlestick pattern recognition algorithms to generate actionable Buy, Sell, or Watch signals. Each recommendation can be validated through detailed chart visualization, ensuring transparency in the detection process. Finally, users can filter results according to their preferences and export them to CSV for further analysis. This structured workflow ensures that the application is both intuitive and effective, guiding users from raw data to meaningful insights in a seamless manner.

## **IMPLEMENTATION DETAILS:**

- Chart Section: Implemented with FigureCanvasTkAgg inside a LabelFrame. Charts are based on daily OHLC data.
- Recommendation Page: Built with Treeview for tabular display. Integrated candlestick plotting via mplfinance.
- Data Handling: Used yfinance to fetch EOD (End of Day) OHLC data. Pandas handled filtering, cleaning, and exporting.
- Navigation: Implemented modular nav\_items with lambda functions and wrappers to manage page transitions.
- Challenges Overcome:
  - Chart conflicts between homepage and recommendation page were solved by isolating chart loops and using Toplevel() windows.
  - Multi-index OHLC data from Yahoo Finance was normalized to single-index columns.
  - UI scaling issues were resolved with responsive layouts (pack, grid, and columnconfigure).

## PRACTICAL IMPLEMENTATION:

- ❖ Homepage before Login: The login page consists a table of advancers and decliners and rotating charts of top 50 stocks. Unless the user has logged in the user cannot access other options in the system

SmartStock Screener 2025-12-27 17:29:07

+0.32% | ADANI PORT & SEZ LTD: ₹1487.1 (-0.48%) | APOLLO HOSPITALS ENTER. L: ₹7156.0 (-0.22%) | ASIAN PAINTS LIMITED: ₹2746.5 (-1.40%) | AXIS BANK LIMITED: ₹1228.2 (+0.15%) | BAJAJ AUTO LIMITED: ₹9064.5 (-1.15%) | BAJAJ FIN

Dashboard Screener Market Overview Recommendations Settings Login

		Advancers: 7   Decliners: 13		
Ticker	Company	Price	% Change	Volume
ADANIENT.NS	ADANI ENTERPRISES LIMITED	2229.9	0.32%	566026
ADANIPORTS.NS	ADANI PORT & SEZ LTD	1487.1	-0.48%	876507
APOLLOHOSP.NS	APOLLO HOSPITALS ENTER. L	7156.0	-0.22%	228149
ASIANPAINT.NS	ASIAN PAINTS LIMITED	2746.5	-1.40%	532037
AXISBANK.NS	AXIS BANK LIMITED	1228.2	0.15%	1665961
BAJAJ-AUTO.NS	BAJAJ AUTO LIMITED	9064.5	-1.15%	105811
BAJFINANCE.NS	BAJAJ FINANCE LIMITED	1000.0	-1.16%	5210389
BAJAJFINSV.NS	BAJAJ FINSERV LTD.	2017.6	-0.89%	1755025
BPLCNS	BHARAT PETROLEUM CORP LT	366.0	0.03%	2997762
BHARTIARTL.NS	BHARTI AIRTEL LIMITED	2105.4	-0.86%	1297766
BRITANNIA.NS	BRITANNIA INDUSTRIES LTD	6032.5	0.04%	65991

Live Stock Chart (Yahoo Finance)

Live Price: APOLLOHOSP

Price

Time

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- ❖ The login page appears once the user clicks on the login button. The login consists of the username that is the e-mail id that the user used during registration. If the user has not registered, they can register. In case the users have forgotten their passwords they have the option to change their passwords.

**SmartStock Screener** 2025-12-27 17:29:31

PITALS ENTER. L: ₹7156.0 (-0.22%) | ASIAN PAINTS LIMITED: ₹2746.5 (-1.40%) | AXIS BANK LIMITED: ₹1228.2 (+0.15%) | BAJAJ AUTO LIMITED: ₹9064.5 (-1.15%) | BAJAJ FINANCE LIMITED: ₹1000.0 (-1.16%) | BAJAJ FINSERV LTD.: ₹2017.6 (-0.89%)

Dashboard
Screeners
Market Overview
Recommendations
Settings
Login

### Login

Username:

Password:

Show Password

**Login**  

[Forgot Password?](#)

[Don't have an account? Register now](#)

**Advancers: 7 | Decliners: 13**

Company	Price	% Change	Volume
ADANI ENTERPRISES LIMITED	2229.9	0.32%	566026
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BHARTI AIRTEL LIMITED	2105.4	-0.86%	1297766
BRITANNIA INDUSTRIES LTD	6032.5	0.04%	65991

**Live Stock Chart (Yahoo Finance)**

Live Price: BAJFINANCE

Price

Time

Developed by Rudra | Final Year CSE

- ❖ Once the user is logged in, he can access all functionalities of the system. There are no remaining barriers and all the buttons become active once the user has logged in.

**SmartStock Screener** 2025-12-27 17:30:12

O LIMITED: ₹9064.5 (-1.15%) | BAJAJ FINANCE LIMITED: ₹1000.0 (-1.16%) | BAJAJ FINSERV LTD.: ₹2017.6 (-0.89%) | BHARAT PETROLEUM CORP LT: ₹366.0 (+0.03%) | BHARTI AIRTEL LIMITED: ₹2105.4 (-0.86%) | BRITANNIA INDUSTRIES LTD: ₹6032.5 (-0.04%)

Dashboard
Screener

Market Overview
Recommendations
Settings
Login

Advancers: 7   Decliners: 13					
	Ticker	Company	Price	% Change	Volume
	ADANIENT.NS	ADANI ENTERPRISES LIMITED	2229.9	0.32%	566026
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	BAJAU-AUTO.NS	BAJAJ AUTO LIMITED	9064.5	-1.15%	105811
	BAJFINANCE.NS	BAJAJ FINANCE LIMITED	1000.0	-1.16%	5210389
	BAJAJFINSV.NS	BAJAJ FINSERV LTD.	2017.6	-0.89%	1755025
	BPCLNS	BHARAT PETROLEUM CORP LT	366.0	0.03%	2997762
	BHARTIARTLNS	BHARTI AIRTEL LIMITED	2105.4	-0.86%	1297766
	BRITANNIA.NS	BRITANNIA INDUSTRIES LTD	6032.5	0.04%	65991

**Live Stock Chart (Yahoo Finance)**

Live Price: DRREDDY

Price

Time

Developed by Rudro | Final Year CSE

- ❖ In the screener page, users can filter out stocks based on various candlestick patterns (Doji, Engulfing, insider candle and Gap up/down) these options are available for both daily and weekly data offering users much better clarity and insight on market patterns and a platform for further analysis.

← Back **SmartStock Screener**

**Candlestick Patterns**

<input type="checkbox"/> Doji Pattern	<input type="checkbox"/> Engulfing Pattern	<input type="checkbox"/> Insider Candle	<input type="checkbox"/> Daily Gap	<input type="checkbox"/> Weekly Gap
<input type="button" value="Update EOD Data"/>				

Ticker	Company	Price	% Change	Pattern

Last updated: Not yet      Developed by Rudro, 4th Year CSE

- ❖ After updating EOD Data, a popup appears informing the user that the data for stocks have been updated to the latest day, this is necessary to ensure that the results are based on the current data

← Back **SmartStock Screener**

Candlestick Patterns

Doji Pattern   Engulfing Pattern   Insider Candle   Daily Gap   Weekly Gap

Update EOD Data

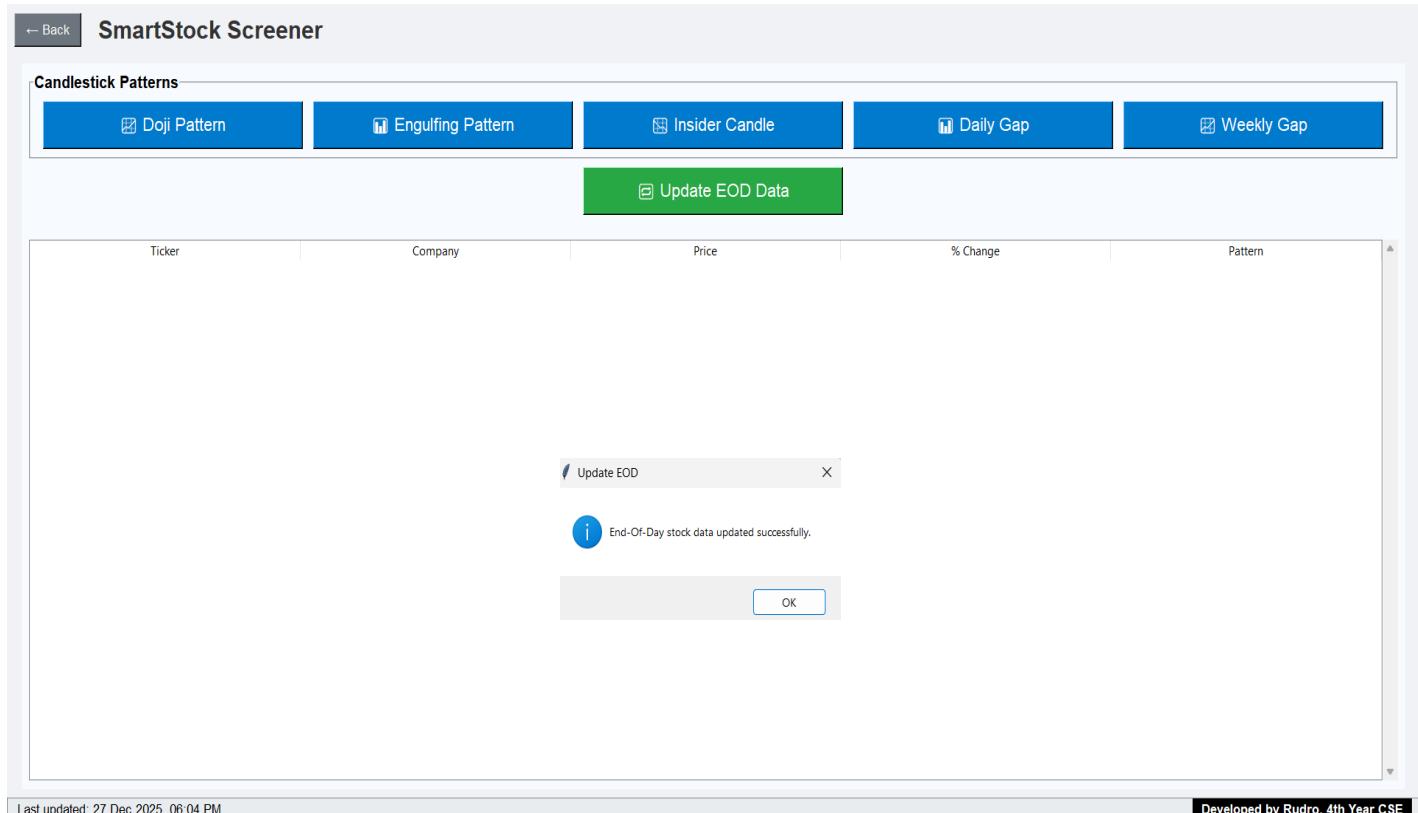
Ticker	Company	Price	% Change	Pattern

Update EOD X

End-Of-Day stock data updated successfully.

OK

Last updated: 27 Dec 2025, 06:04 PM Developed by Rudro, 4th Year CSE



- ❖ Output of Daily Doji- The users are informed when the screening is completed the output is displayed in the form of a table that displays the closing price and also the percentage change in price along with the pattern. The output displayed below is for the doji pattern based on daily data but users have the option to apply the screening process to the stocks based on weekly data.

← Back **SmartStock Screener**

Candlestick Patterns

Doji Pattern Engulfing Pattern Insider Candle Daily Gap Weekly Gap

Update EOD Data

Ticker	Company	Price	% Change	Pattern
ABDL	Allied Blenders and Distillers Limited	613.55	-1.27%	Red Doji
ACC	ACC Limited	1735.30	-0.24%	Red Doji
ADANIGREEN	Adani Green Energy Limited	1018.10	+0.31%	Green Doji
ADANIPORTS	Adani Ports and Special Economic Zone Limited	1487.10	-0.48%	Red Doji
ADANIPOWER	Adani Power Limited	142.19	-0.68%	Red Doji
AFCONS	Afcons Infrastructure Limited	389.95	+0.59%	Green Doji
AMBUJACEM	Ambuja Cements Limited	554.65	+1.20%	Green Doji
APOLLOHOSP	Apollo Hospitals Enterprise Limited	7156.00	-0.22%	Red Doji
ASTRAL	Astral Limited	1390.00	-0.47%	Red Doji
AUROPHARMA	Aurobindo Pharma Limited	1206.20	-0.43%	Red Doji
AWL	AWL Agri Business Limited	236.95	+0.00%	Red Doji
AXISBANK	Axis Bank Limited	1228.20	+0.15%	Green Doji
BANKBARODA	Bank of Baroda	288.20	-0.81%	Red Doji
BANKINDIA	Bank of India	139.77	-0.01%	Red Doji
BHARTIARTL	Bharti Airtel Limited	2105.40	-0.86%	Red Doji
BSE	BSE Limited	2649.00	-0.82%	Red Doji
CDSL	Central Depository Services (India) Limited	1482.70	-1.08%	Red Doji
CGPOWER	CG Power and Industrial Solutions Limited	656.00	-0.74%	Red Doji
CHOICEIN	Choice International Limited	822.50	+0.99%	Green Doji
CPLA	Cipla Limited	1506.00	+0.65%	Green Doji
COHANCE	Cohance Lifesciences Limited	537.35	+0.21%	Green Doji
CROMPTON	Crompton Greaves Consumer Electricals Limited	256.85	-0.21%	Red Doji
CYIENT	Cyient Limited	1119.40	-0.20%	Red Doji
DABUR	Dabur India Limited	488.20	-0.48%	Red Doji
DELIVERY	Delivery Limited	407.25	+0.28%	Green Doji
DLF	DLF Limited	695.00	+0.01%	Green Doji
DMART	Avenue Supermarts Limited	3787.40	-0.34%	Red Doji
DRREDDY	Dr. Reddy's Laboratories Limited	1269.30	+0.28%	Green Doji
EIDPARRY	EID Parry India Limited	1068.70	+0.67%	Green Doji
EMAMILTD	Emami Limited	514.70	-0.39%	Red Doji
ENRIN	Siemens Energy India Limited	2625.10	+1.14%	Green Doji

Last updated: Not yet Developed by Rudro, 4th Year CSE

Results Loaded X

i Daily Doji screening complete.

OK

## ❖ Output of Weekly Engulfing- The output is akin to the output of doji screening

SmartStock Screener

Candlestick Patterns

- [Doji Pattern](#)
- [Engulfing Pattern](#)
- [Insider Candle](#)
- [Daily Gap](#)
- [Weekly Gap](#)

[Update EOD Data](#)

Ticker	Company	Price	% Change	Pattern
360ONE	360 ONE WAM LIMITED	1179.40	+3.56%	Bullish Engulfing
AEQUIS	Aequis Limited	139.37	-7.66%	Bearish Engulfing
AGIL	Agi Infra Limited	251.40	-4.83%	Bearish Engulfing
ARVIND	Arvind Limited	310.50	-2.88%	Bearish Engulfing
ASTRAL	Astral Limited	1390.00	-2.36%	Bearish Engulfing
BANKINDIA	Bank of India	139.77	-2.40%	Bearish Engulfing
BBOX	Black Box Limited	550.90		Bullish Engulfing
BLS	BLS International Services Limited	320.20		Bearish Engulfing
BOMDYEING	Bombay Dyeing & Mtg Company Limited	129.72		Bearish Engulfing
CAMS	Computer Age Management Services Limited	748.80		Bearish Engulfing
CESC	CESC Limited	166.59		Bearish Engulfing
CGPOWER	CG Power and Industrial Solutions Limited	656.00		Bearish Engulfing
DABUR	Dabur India Limited	488.20		Bearish Engulfing
DALBHARAT	Dalmia Bharat Limited	2160.60		Bullish Engulfing
DIACABS	Diamond Power Infrastructure Limited	1399.93		Bearish Engulfing
FIRSTCRY	Brainbees Solutions Limited	285.20		Bearish Engulfing
FIVESTAR	Five-Star Business Finance Limited	552.70		Bearish Engulfing
FSL	Firstsource Solutions Limited	342.65	-1.11%	Bearish Engulfing
GMRP&UI	GMR Power and Urban Infra Limited	110.89	-3.50%	Bearish Engulfing
GPLL	Gujarat Pipavav Port Limited	183.02	-5.47%	Bearish Engulfing
HDBFS	HDB Financial Services Limited	758.40	-1.87%	Bearish Engulfing
JACORPLTD	Jai Corp Limited	123.52	+3.69%	Bullish Engulfing
KMWEW	Knowledge Marine & Engineering Works Limited	1884.00	+15.38%	Bullish Engulfing
LT	Larsen & Toubro Limited	4047.30	-0.64%	Bearish Engulfing
LUPIN	Lupin Limited	2112.40	-0.63%	Bearish Engulfing
NETWEB	Netweb Technologies India Limited	3147.60	-3.18%	Bearish Engulfing
OIL	Oil India Limited	402.75	-0.57%	Bearish Engulfing
PERSISTENT	Persistent Systems Limited	6300.50	-0.90%	Bearish Engulfing
POWERGRID	Power Grid Corporation of India Limited	265.45	+0.6%	Bullish Engulfing
PRECWIRE	Precision Wires India Limited	237.45	+2.22%	Bullish Engulfing
SANDHAR	Sandhar Technologies Limited	549.40	-1.77%	Bearish Engulfing

Last updated: Not yet

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## ❖ Output of Weekly Gap Up

SmartStock Screener

Candlestick Patterns

- [Doji Pattern](#)
- [Engulfing Pattern](#)
- [Insider Candle](#)
- [Daily Gap](#)
- [Weekly Gap](#)

[Update EOD Data](#)

Ticker	Company	Price	% Change	Pattern
AKUMS	Akums Drugs and Pharmaceuticals Limited	446.40	+4.49%	Gap Up
CUPID	Cupid Limited	479.50	+7.10%	Gap Up
HINDCOPPER	Hindustan Copper Limited	475.60	+22.72%	Gap Up
HINDZINC	Hindustan Zinc Limited	636.85	+8.17%	Gap Up
IRCTC	Indian Railway Catering And Tourism Corporation Limi	705.50	+4.67%	Gap Up
JSWINFRA	JSW Infrastructure Limited	284.30	+2.60%	Gap Up
KEC	KEC International Limited	732.05	+2.96%	Gap Up
RITES	RITES Limited	252.65	+11.52%	Gap Up
SHIRAMFIN	Shriram Finance Limited	960.25	+6.49%	Gap Up
TEXRAIL	Texmaco Rail & Engineering Limited	140.09	+8.40%	Gap Up

Results Loaded

Weekly Gap Up screening complete.

OK

Last updated: Not yet

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- ❖ In the Market-Overview page, there are three options- Gainers, Losers and Volume Shockers for both Price up and Price Down data. They are displayed based on the table format that is also used to display

Ticker	Price	Volume	% Change	Pattern
20MICRONS	217.71	10,772,476	+10.04%	Volume Shockers - Price Up
AHCL	145.38	350,297	+4.00%	Volume Shockers - Price Up
APOLLO	267.55	6,720,205	+1.73%	Volume Shockers - Price Up
ASTERDM	617.95	953,892	+3.47%	Volume Shockers - Price Up
BBOX	550.90	1,057,579	+3.40%	Volume Shockers - Price Up
CANHLIFE	151.64	5,276,118	+4.27%	Volume Shockers - Price Up
CASTROLIND	193.48	16,924,568	+2.16%	Volume Shockers - Price Up
CONCOR	520.30	2,498,657	+2.30%	Volume Shockers - Price Up
CRIZAC	292.35	266,924	+2.52%	Volume Shockers - Price Up
CUBEXTUB	112.89	1,546,829	+19.36%	Volume Shockers - Price Up
DALBHARAT	2160.60	726,199	+2.43%	Volume Shockers - Price Up
DBL	476.85	1,668,154	+2.39%	Volume Shockers - Price Up
DLINKINDIA	435.10	191,795	+3.66%	Volume Shockers - Price Up
ENGINERSIN	205.35	4,904,849	+2.09%	Volume Shockers - Price Up
FACT	888.65	258,841	+1.54%	Volume Shockers - Price Up
GIPCL	158.71	667,586	+1.76%	Volume Shockers - Price Up
GMBREW	1196.40	885,427	+7.74%	Volume Shockers - Price Up
GMDCLTD	589.00	25,397,549	+7.94%	Volume Shockers - Price Up
GOOCOLORS	472.75	176,906	+1.50%	Volume Shockers - Price Up
GRAPHITE	582.80		+2.09%	Volume Shockers - Price Up
GREENPLY	265.90		+2.41%	Volume Shockers - Price Up
HEG	559.80		+1.68%	Volume Shockers - Price Up
HEMIPROP	140.77		+7.34%	Volume Shockers - Price Up
HINDCOOPER	475.60		+8.95%	Volume Shockers - Price Up
HUDCO	221.63		+2.50%	Volume Shockers - Price Up
IGIL	335.00		+1.85%	Volume Shockers - Price Up
IONEXCHANG	383.50		+3.99%	Volume Shockers - Price Up
IRCON	178.71		+4.69%	Volume Shockers - Price Up
IRCTC	705.50		+3.80%	Volume Shockers - Price Up
IREDA	140.99		+2.09%	Volume Shockers - Price Up
IRFC	133.64		+10.00%	Volume Shockers - Price Up
ITCHOTELS	198.49		+1.61%	Volume Shockers - Price Up
ITDC	593.35		+4.33%	Volume Shockers - Price Up
JAICORPLTD	132.52		+2.97%	Volume Shockers - Price Up
JNKINDIA	256.33		+12.61%	Volume Shockers - Price Up
KARURVSYA	262.81		+5.08%	Volume Shockers - Price Up
KIOC	393.65		+3.39%	Volume Shockers - Price Up
KIRININDUS	604.70		+2.74%	Volume Shockers - Price Up
KNRCON	178.93		+4.63%	Volume Shockers - Price Up
MIDHANI	318.60		+2.33%	Volume Shockers - Price Up
MIDWESTLTD	1687.20		+3.80%	Volume Shockers - Price Up
MODIRUBBER	167.05		+9.70%	Volume Shockers - Price Up
MOIL	364.85		+4.90%	Volume Shockers - Price Up
MSTCLTD	510.80		+4.07%	Volume Shockers - Price Up

Results Loaded

Volume Shockers - Price Up loaded successfully.

OK

Show Gainers
 Show Losers
 Volume Shockers

- ❖ In the Recommendation Page, the system predicts the recommendations to the users based on the candlestick patterns that were used in the screener page and patterns for both daily and weekly patterns are calculated for all candlestick patterns. In case there are stocks that fall in two candlestick patterns and one pattern is based on daily data and another on weekly data, then the pattern pertaining to the weekly data is preferred. The image below is the table of recommended stocks to be sold.

SmartStock: Candlestick-Based Recommendations						
		Buy	Sell	Watch		
Ticker	Daily Pattern	Weekly Pattern	Preferred Pattern		Timeframe	Recommendation
ASTRAL	Red Doji	Bearish Engulfing	Bearish Engulfing		Weekly	Sell
BANKINDIA	Red Doji	Bearish Engulfing	Bearish Engulfing		Weekly	Sell
CGPOWER	Red Doji	Bearish Engulfing	Bearish Engulfing		Weekly	Sell
DABUR	Red Doji	Bearish Engulfing	Bearish Engulfing		Weekly	Sell
LICI	Gap Down	Red Doji	Gap Down		Daily	Sell
LT	Red Doji	Bearish Engulfing	Bearish Engulfing		Weekly	Sell
LUPIN	Green Doji	Bearish Engulfing	Bearish Engulfing		Weekly	Sell
PERSISTENT	Red Doji	Bearish Engulfing	Bearish Engulfing		Weekly	Sell
SONACOMS	Red Doji	Bearish Engulfing	Bearish Engulfing		Weekly	Sell
TI	Bearish Engulfing		Bearish Engulfing		Daily	Sell
TVSMOTOR	Red Doji	Bearish Engulfing	Bearish Engulfing		Weekly	Sell
AEROFLEX	Bearish Engulfing		Bearish Engulfing		Daily	Sell
BEL	Bearish Engulfing		Bearish Engulfing		Daily	Sell
BLS	Bearish Engulfing	Bearish Engulfing	Bearish Engulfing		Weekly	Sell
DAMCAPITAL	Bearish Engulfing		Bearish Engulfing		Daily	Sell
EDELWEISS	Bearish Engulfing		Bearish Engulfing		Daily	Sell
GARUDA	Bearish Engulfing		Bearish Engulfing		Daily	Sell
GESHIP	Bearish Engulfing		Bearish Engulfing		Daily	Sell
HAL	Bearish Engulfing		Bearish Engulfing		Daily	Sell
KPIGREEN	Bearish Engulfing		Bearish Engulfing		Daily	Sell
LEMONTREE	Bearish Engulfing		Bearish Engulfing		Daily	Sell
MARKOLINES	Bearish Engulfing		Bearish Engulfing		Daily	Sell
ORKLAININDIA	Bearish Engulfing		Bearish Engulfing		Daily	Sell
PREMIERENE	Bearish Engulfing		Bearish Engulfing		Daily	Sell
SARDAEN	Bearish Engulfing		Bearish Engulfing		Daily	Sell
SBICARD	Bearish Engulfing	Bearish Engulfing	Bearish Engulfing		Weekly	Sell
SHRINGARMS	Bearish Engulfing		Bearish Engulfing		Daily	Sell
SIGNATURE	Bearish Engulfing		Bearish Engulfing		Daily	Sell

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- ❖ The image below is the table of recommended stocks to be bought. The table of stocks to be bought/sold can also be downloaded in the form of a CSV file for further examination and analysis by clicking on the 'Export to CSV' button.

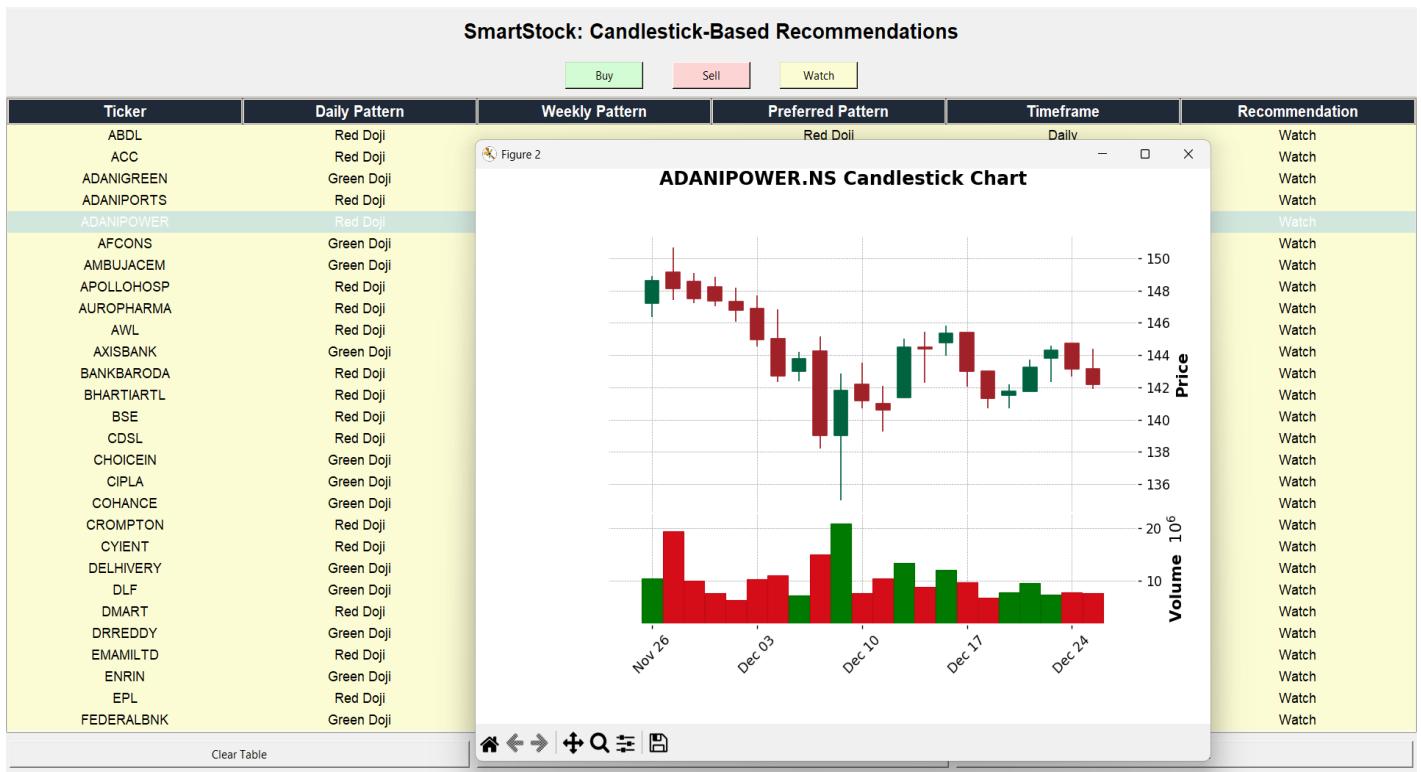
SmartStock: Candlestick-Based Recommendations						
		Buy	Sell	Watch		
Ticker	Daily Pattern	Weekly Pattern	Preferred Pattern	Timeframe	Recommendation	
EIDPARRY	Bullish Engulfing		Bullish Engulfing	Daily	Buy	
INOXGREEN	Bullish Engulfing		Bullish Engulfing	Daily	Buy	
KEC	Red Doji	Gap Up	Gap Up	Weekly	Buy	
PRECWIRE	Green Insider Candle	Bullish Engulfing	Bullish Engulfing	Weekly	Buy	
SKYGOLD	Bullish Engulfing		Bullish Engulfing	Daily	Buy	
GANDHAR	Bullish Engulfing		Bullish Engulfing	Daily	Buy	
GIPCL	Bullish Engulfing		Bullish Engulfing	Daily	Buy	
GODREJCP	Bullish Engulfing		Bullish Engulfing	Daily	Buy	
IREDA	Bullish Engulfing		Bullish Engulfing	Daily	Buy	
ITDC	Bullish Engulfing		Bullish Engulfing	Daily	Buy	
JAICORPLTD	Bullish Engulfing	Bullish Engulfing	Bullish Engulfing	Weekly	Buy	
KALYANKJIL	Bullish Engulfing		Bullish Engulfing	Daily	Buy	
RALLIS	Bullish Engulfing		Bullish Engulfing	Daily	Buy	
RITES	Bullish Engulfing	Gap Up	Bullish Engulfing	Daily	Buy	
SWANCORP	Bullish Engulfing	Red Doji	Bullish Engulfing	Daily	Buy	
TAJGVK	Bullish Engulfing		Bullish Engulfing	Daily	Buy	
TBZ	Bullish Engulfing		Bullish Engulfing	Daily	Buy	
TITAN	Bullish Engulfing		Bullish Engulfing	Daily	Buy	
TORNTPOWER	Bullish Engulfing		Bullish Engulfing	Daily	Buy	
VBL	Bullish Engulfing	Green Doji	Bullish Engulfing	Daily	Buy	
AXITA	Gap Up		Gap Up	Daily	Buy	
EXCEL	Gap Up		Gap Up	Daily	Buy	
GREENPLY	Gap Up		Gap Up	Daily	Buy	
HINDCOPPER	Gap Up	Gap Up	Gap Up	Weekly	Buy	
MODIRUBBER	Gap Up		Gap Up	Daily	Buy	
PANACEABIO	Gap Up		Gap Up	Daily	Buy	
360ONE		Bullish Engulfing	Bullish Engulfing	Weekly	Buy	
BBOX		Bullish Engulfing	Bullish Engulfing	Weekly	Buy	

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- ❖ For deeper analysis into individual stocks, they can be selected by clicking on them and then click on ‘View Chart’ button. This gives us the price and volume of the individual stocks over a certain period of time



## **LOGIC BEHIND THE DIFFERENT CANDLESTICK PATTERN:**

- **Doji**: To identify Doji candlestick patterns, the system compares the difference between the opening and closing prices against a 1% threshold of the closing price. It further checks that the upper and lower shadows are nearly equal within a 0.5% tolerance. If these conditions are met, the candlestick is classified as a bullish or bearish Doji depending on whether the close is higher or lower than the open. Otherwise, no Doji is detected. This is applicable to both daily and weekly patterns.
  
- **Engulfing**: The requirement to identify this pattern is at least two consecutive trading days are required to compare the previous day's candlestick with the current day's candlestick.  
To detect daily engulfing patterns, the system compares two consecutive candlesticks. A bullish engulfing is identified when a bearish candle is followed by a larger bullish candle that completely covers the previous day's range, with a benchmark volume and price thresholds. Conversely, a bearish engulfing is identified when a bullish candle is followed by a larger bearish candle that engulfs the prior day. These conditions ensure that only strong reversal signals are captured, reducing noise and improving recommendation accuracy.  
In addition to daily engulfing detection, the system also evaluates weekly engulfing patterns. This involves segmenting stock data into consecutive weeks, determining weekly open and close prices, and calculating average weekly volume. The engulfing conditions are then applied to these weekly candlesticks, allowing the system to capture longer-term reversal signals. Furthermore, the weekly logic records the percentage change between consecutive weeks, providing a broader perspective on market trends and strengthening the reliability of recommendations.
  
- **Insider Candle**: The Insider Candle logic identifies situations where the current day's candlestick is fully contained within the range of the previous day's candlestick. Depending on whether the current candle is bullish or bearish, it is classified as a Green Insider Candle or Red Insider Candle. This pattern highlights periods of consolidation and potential reversal, with filters applied for volume and price thresholds to ensure significance  
The weekly insider candle logic builds upon the daily version by segmenting data into consecutive weeks, calculating weekly open/close prices, and ensuring that

the current week's candlestick is fully contained within the range of the previous week. Additional requirements include computing weekly highs and lows, averaging weekly volume, and applying thresholds for minimum volume and price. The system also records the percentage change between weekly closes, making the weekly insider candle detection more robust and suitable for identifying medium-term consolidation or reversal signals.

- **Gap Up/Down for daily data:** The system detects Gap Up and Gap Down patterns by comparing consecutive trading days. A Gap Up occurs when the current day's trading range opens and trades entirely above the previous day's high, with strong volume confirming bullish sentiment. Conversely, a Gap Down occurs when the current day's trading range opens and trades entirely below the previous day's low, with strong volume confirming bearish sentiment. These checks ensure that only significant gaps backed by liquidity are captured, improving the reliability of recommendations.
- **Gap Up/Down for weekly data:** The weekly gap detection logic compares consecutive weekly candlesticks. A Gap Up occurs when the current week's trading range opens and trades entirely above the previous week's high, with strong volume confirming bullish sentiment. Conversely, a Gap Down occurs when the current week's trading range opens and trades entirely below the previous week's low, with strong volume confirming bearish sentiment. By averaging weekly volume and applying price thresholds, the system ensures that only significant weekly gaps are captured, making the recommendations more reliable for medium-term analysis.
- **MySQL:** MySQL is used in the project as the backend database to store and manage user registration details. The system connects to the “stock” database and maintains a “USER” table containing fields such as name, email, mobile number, state, city, and password. When a new user signs up, their details are inserted into the table, while login attempts are validated by checking the stored email and password. Additional functions ensure that duplicate registrations are prevented and that credentials are verified accurately. This integration of MySQL provides a secure, structured, and reliable way to handle user data within the application.

## **RESULTS AND EVALUATION:**

- Successfully integrated EOD candlestick charts for analysis.
- Built a recommendation engine that categorizes stocks into 'Buy', 'Sell', and 'Watch' based on candlestick patterns.
- Enabled CSV export of filtered recommendations with timestamps.
- Achieved a modular GUI where each page (Homepage, Screener, Recommendations, Overview, Settings) is self-contained and scalable.
- Demonstrated robustness by handling empty data and UI conflicts gracefully.

## **CONCLUSION & FUTURE SCOPE:**

This project demonstrates a complete stock analysis platform combining data visualization, automation, and GUI design using End-of-Day data. It solves the problem of fragmented workflows by offering a unified, beginner-friendly tool.

Future Enhancements:

- Add real-time intraday data support for live monitoring of all stocks.
- Integrate machine learning models for predictive recommendations.
- Provide portfolio tracking and performance analytics.
- Enhance UI/UX with themes, dashboards, and interactive chart controls.
- Deploy as a web or mobile app for broader accessibility.