Data Analysis Report(Nifty 50)

1. Introduction

This report presents an analysis of the Nifty Fifty dataset, covering various aspects such as data exploration, cleaning, feature engineering, and visualization. The dataset consists of stock market data, including Open, High, Low, Close prices, Shares Traded, and Turnover.

2. Data Overview

- **Total Rows:** 126
- **Total Columns:** 8
- **Columns:** Date, Open, High, Low, Close, Shares Traded, Turnover (₹ Cr)
- **Missing Values:** 0
- **Duplicate Entries:** 0

3. Data Cleaning & Preprocessing

- Converted the 'Date' column to a datetime format.
- Handled missing values by dropping incomplete rows.
- Removed duplicate entries.
- Calculated **Daily Return (%)** using (Close - Open) / Open * 100.
- Computed a **7-day Moving Average** of closing prices.

4. Feature Engineering

- **Daily Return Calculation:** If 'Open' and 'Close' exist in the dataset, calculated daily return using (Close - Open) / Open * 100.
- **7-day Moving Average:** If 'Close' exists, computed a rolling mean with a 7-day window.

5. Exploratory Data Analysis (EDA)

Closing Price Trend

A line chart was plotted to observe the trend of closing prices over time.

Feature Correlation

A heatmap visualization was used to examine correlations between variables. Notable findings:

- High correlation between Open, Close, High, and Low prices.
- Turnover and Shares Traded are strongly correlated.

Daily Return Distribution

A histogram was plotted to analyze the distribution of daily returns. Observations:

- Most returns are clustered around a small percentage range.
- A few extreme values indicate high volatility on certain days.

6. Key Insights

Most Traded Days

Top 10 days with the highest number of shares traded:

Date	Shares Traded
November 25, 2024	687,172,787
August 30, 2024	638,166,179
September 20, 2024	533,067,422
September 27, 2024	490,332,370
August 5, 2024	486,994,718
December 20, 2024	442,714,411
August 1, 2024	431,313,292
October 3, 2024	423,395,030
November 21, 2024	420,332,354

July 30, 2024	384,989,431

A bar chart visualization was created to highlight these days.

Least Performing Days

Top 10 days with the lowest daily return:

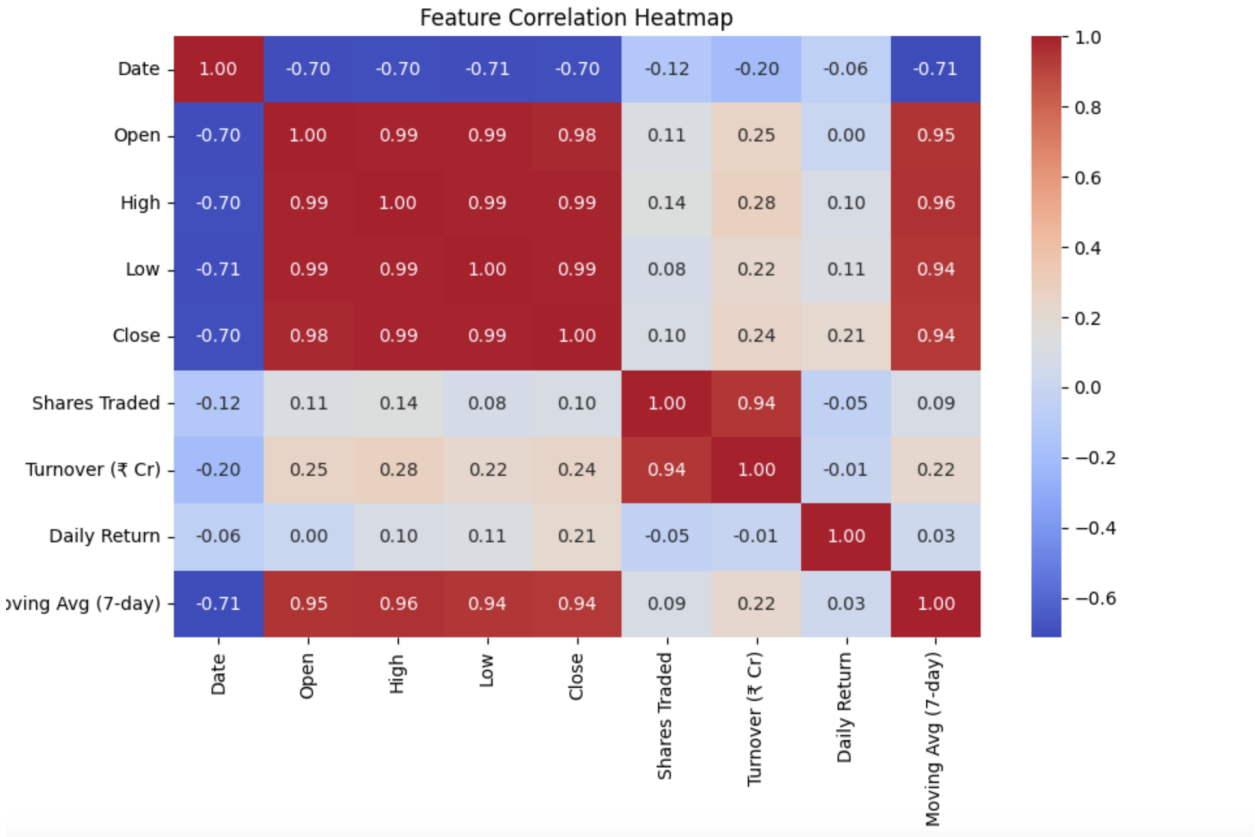
Least Performing Days Table:

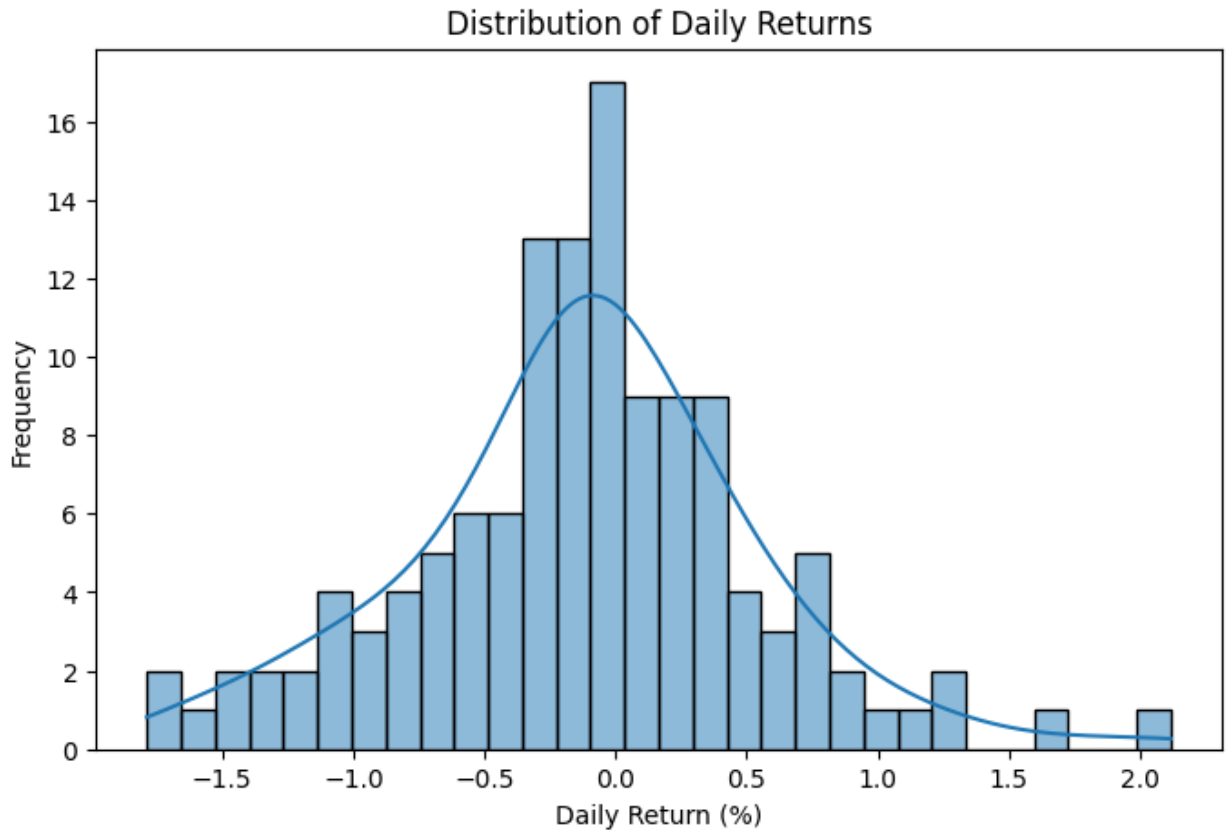
Date	Performance Value
January 6, 2025	-1.7872
January 21, 2025	-1.6950
December 20, 2024	-1.5576
November 28, 2024	-1.4831
November 12, 2024	-1.4132
November 4, 2024	-1.3177
October 22, 2024	-1.3168
November 7, 2024	-1.1852
October 7, 2024	-1.1495
October 17, 2024	-1.1090

A bar chart was generated to visualize these worst-performing days.

	Open	High	Low	Close	Shares Traded	Turnover (₹ Cr)
count	127.000000	127.000000	127.000000	127.000000	1.270000e+02	127.000000
mean	24452.412205	24559.081890	24314.801969	24422.829528	2.891581e+08	30342.201654
std	745.052162	742.198116	765.005118	762.238109	8.599530e+07	10803.020195
min	22940.150000	23007.450000	22786.900000	22829.150000	3.881139e+07	3348.450000
25%	23896.825000	24077.875000	23776.075000	23895.350000	2.390233e+08	25140.035000
50%	24386.850000	24503.350000	24280.200000	24435.500000	2.759519e+08	28046.450000
75%	25024.125000	25085.850000	24890.975000	24976.625000	3.170228e+08	33111.485000
max	26248.250000	26277.350000	26151.400000	26216.050000	6.871728e+08	89554.910000


Closing Price Trend
Close Price
26000
25500
25000
24500
24000
23500
23000
2024-08
2024-09
2024-10
2024-11
2024-12
2025-01
2025-02
Date


Feature Correlation Heatmap
Date 1.00 -0.70 -0.70 -0.71 -0.70 -0.12 -0.20 -0.06 -0.71
Open -0.70 1.00 0.99 0.99 0.98 0.11 0.25 0.00 0.95
High -0.70 0.99 1.00 0.99 0.99 0.14 0.28 0.10 0.96
Low -0.71 0.99 0.99 1.00 0.99 0.08 0.22 0.11 0.94
Close -0.70 0.98 0.99 0.99 1.00 0.10 0.24 0.21 0.94
Shares Traded -0.12 0.11 0.14 0.08 0.10 1.00 0.94 -0.05 0.09
Turnover (₹ Cr) -0.20 0.25 0.28 0.22 0.24 0.94 1.00 -0.01 0.22
Daily Return -0.06 0.00 0.10 0.11 0.21 -0.05 -0.01 1.00 0.03
oving Avg (7-day) -0.71 0.95 0.96 0.94 0.94 0.09 0.22 0.03 1.00
Date
Open
High
Low
Close
Shares Traded
Turnover (₹ Cr)
Daily Return
Moving Avg (7-day)
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6



7. Conclusion

- The market exhibited strong trends with periods of volatility.
- High correlation exists among stock prices, indicating consistent movement.
- Identified key trading days and major losses.

This report summarizes the findings based on the dataset. Further statistical modeling could be applied for trend prediction and risk assessment.