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Introduction to R

Assignment

- Dataset - NIFTY 50 August-October 2023

This data represents NIFTY 50 index price for the last 3 months. Here our variables are Open,High,Low & Close price of the index. Also Shares Traded and Daily Turnover of the NIFTY 50 index.

Date	Open	High	Low	Close	Shares Traded	Turnover (in Cr)
01-Aug-23	19784	19795.6	19704.6	19733.55	298048161	24554.71
02-Aug-23	19655.4	19678.25	19423.55	19526.55	290666798	23997.47
03-Aug-23	19463.75	19537.65	19296.45	19381.65	315688612	29899.38
04-Aug-23	19462.8	19538.85	19436.45	19517	280799561	28086.15
07-Aug-23	19576.85	19620.45	19524.8	19597.3	216586074	21655.87
08-Aug-23	19627.2	19634.4	19533.1	19570.85	260294052	25437.47
09-Aug-23	19578.8	19645.5	19467.5	19632.55	266495074	23201.75
10-Aug-23	19605.55	19623.6	19495.4	19543.1	312193785	29430.34
11-Aug-23	19554.25	19557.75	19412.75	19428.3	235524048	24521.24
14-Aug-23	19383.95	19465.85	19257.9	19434.55	243850815	22767.43
16-Aug-23	19369	19482.75	19317.2	19465	226627230	21484.66
17-Aug-23	19450.55	19461.55	19326.25	19365.25	268663456	26505.65
18-Aug-23	19301.75	19373.8	19253.6	19310.15	256142364	25641.41
21-Aug-23	19320.65	19425.95	19296.3	19393.6	262589133	20738.75
22-Aug-23	19417.1	19443.5	19381.3	19396.45	208704354	20226.48
23-Aug-23	19439.2	19472.05	19366.6	19444	225214991	20167.16
24-Aug-23	19535.15	19584.45	19369	19386.7	268256859	24338.24
25-Aug-23	19297.4	19339.55	19229.7	19265.8	466518217	24998.12

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Date	Open	High	Low	Close	Shares Traded	Turnover (in Cr)
06-Oct-23	19621.2	19675.75	19589.4	19653.5	159051277	16096.52
09-Oct-23	19539.45	19588.95	19480.5	19512.35	165094800	15499.67
10-Oct-23	19565.6	19717.8	19565.45	19689.85	216559447	18735.62
11-Oct-23	19767	19839.2	19756.95	19811.35	213729730	19900.99
12-Oct-23	19822.7	19843.3	19772.65	19794	217904144	20999.94
13-Oct-23	19654.55	19805.4	19635.3	19751.05	254955979	24363.02
16-Oct-23	19737.25	19781.3	19691.85	19731.75	180964341	14746.01
17-Oct-23	19843.2	19849.75	19775.65	19811.5	185846716	16839.87
18-Oct-23	19820.45	19840.95	19659.95	19671.1	198942937	18581.64
19-Oct-23	19545.2	19681.8	19512.35	19624.7	230312163	23582.01
20-Oct-23	19542.15	19593.8	19518.7	19542.65	198341255	17944.31
23-Oct-23	19521.6	19556.85	19257.85	19281.75	176044288	16212.9
25-Oct-23	19286.45	19347.3	19074.15	19122.15	225291741	19818.32
26-Oct-23	19027.25	19041.7	18837.85	18857.25	300356469	28939.64
27-Oct-23	18928.75	19076.15	18926.65	19047.25	205201044	19947.48
30-Oct-23	19053.4	19158.5	18940	19140.9	180132492	17095.73
31-Oct-23	19232.95	19233.7	19056.45	19079.6	206049341	19397.36

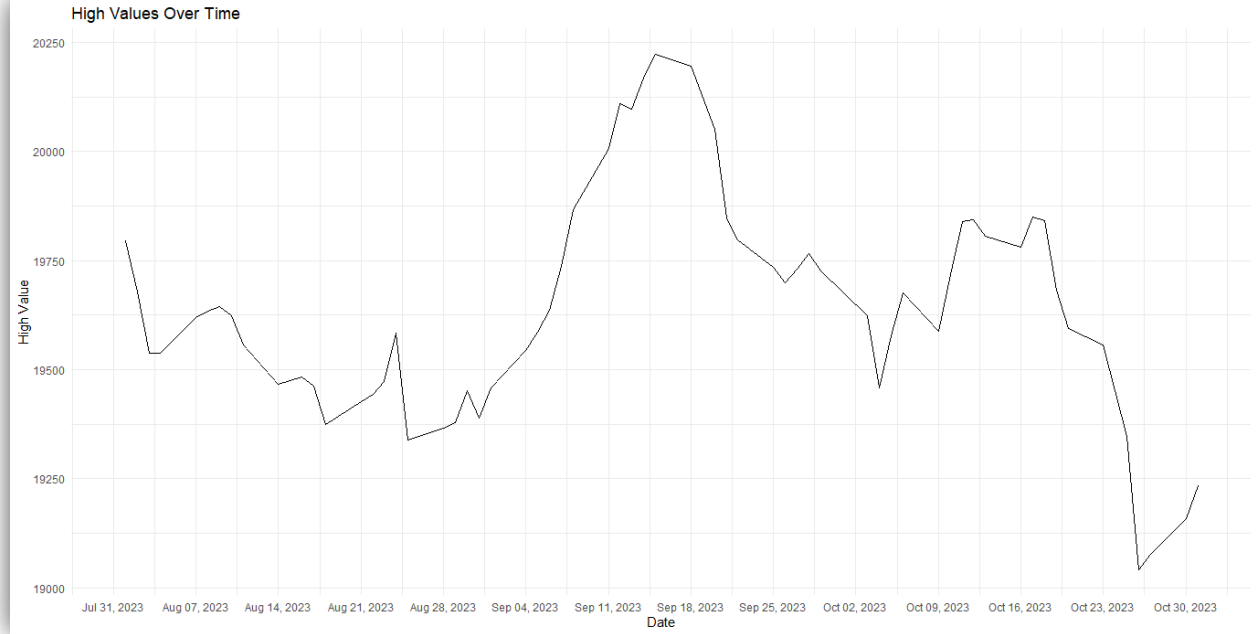
❖ Data Visualization

1. Line Charts

Input 1:

```
#1 HIGH VALUE WITH RESPECT TO DATE

# Install and load necessary packages
install.packages("ggplot2")
library(ggplot2)

# Create a ggplot object
ggplot(data, aes(x = as.Date(Date, format="%d-%b-%y"), y = High)) +

  # Specify the plot type as a line plot
  geom_line() +

  # Add labels and title
  labs(x = "Date", y = "High Value", title = "High Values Over Time") +

  # Improve x-axis date formatting
  scale_x_date(date_labels = "%b %d, %Y", date_breaks = "1 week") +

  # Display the plot
  theme_minimal()
```

Output 1:



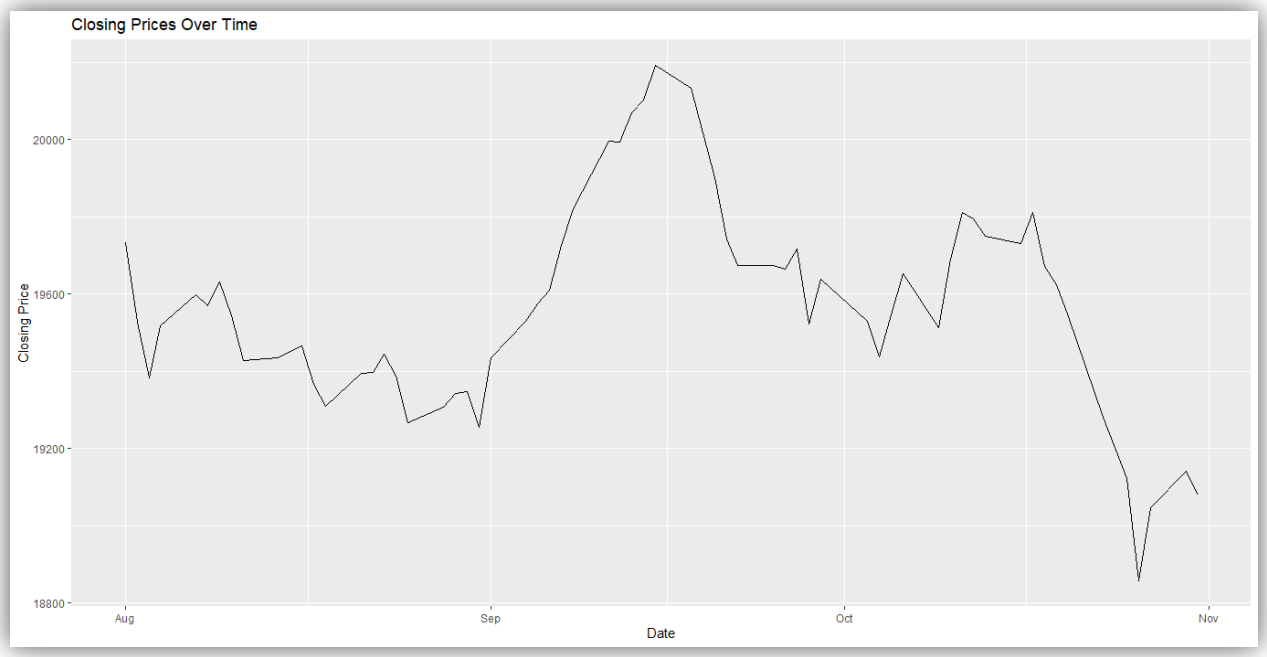
Interpretation 1: NIFTY 50 DAILY HIGH PRICE

Here we have used Line Chart for Nifty 50 high price of the day. And from the graph, we interpret that NIFTY50 reached all time high on 14th September 2023.

Input 2:

```
# Line plot of Closing Prices over time
ggplot(data, aes(x = Date, y = Close)) +
  geom_line() +
  labs(title = "Closing Prices Over Time",
       x = "Date",
       y = "Closing Price")
```

Output 2:



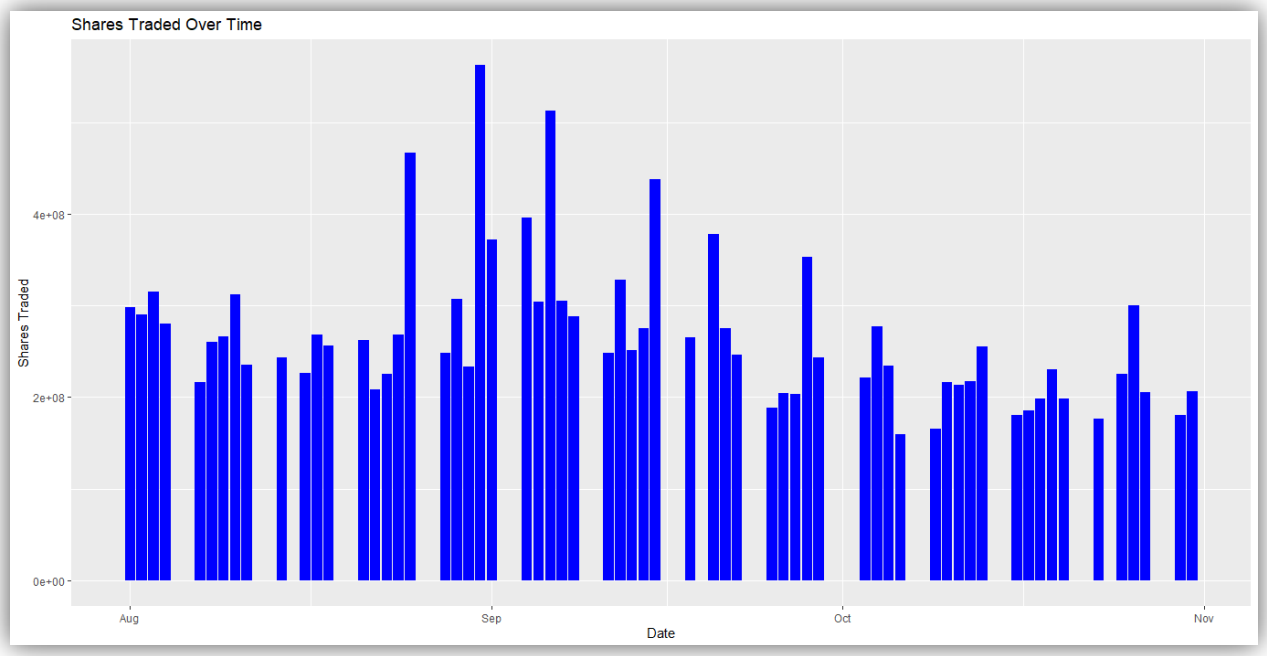
Interpretation 2: Similarly, we have used Line Chart for the Daily closing prices of NIFTY 50 index. Here we can see the bearish downtrend in the market during mid-October and early November.

2. Bar Plot

Input 3:

```
# Bar plot of Shares Traded
ggplot(data, aes(x = Date, y = Shares_Traded)) +
  geom_bar(stat = "identity", fill = "blue") +
  labs(title = "Shares Traded Over Time",
       x = "Date",
       y = "Shares Traded")
```

Output 3:



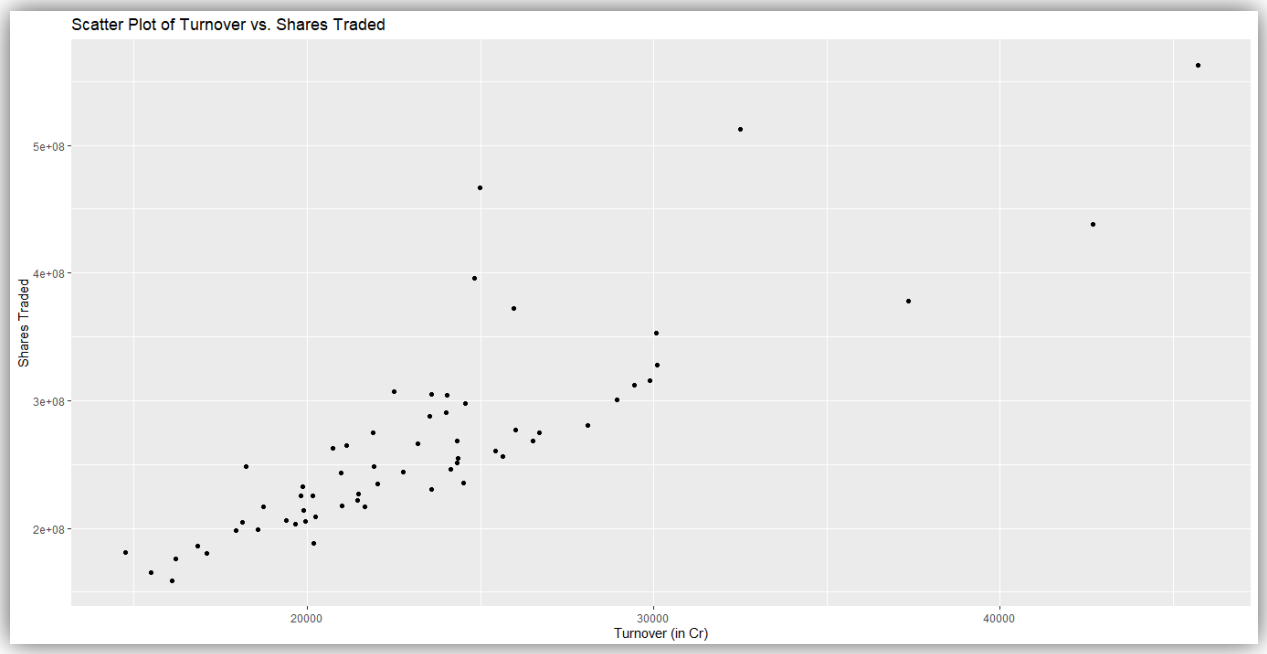
Interpretation 3: The Bar Plot represents Shares Traded Daily or Daily Transaction for Nifty 50 index. In early September we can see a spike in the Graph which means investors/traders were optimistic in the market also because Nifty reaches all-time high in that time which makes the Bar Plot data of September the highest for Shares Traded over time.

3. Scatter Diagram

Input 4:

```
# Scatter plot of Turnover vs. Shares Traded
ggplot(data, aes(x = Turnover_Cr, y = Shares_Traded)) +
  geom_point() +
  labs(title = "Scatter Plot of Turnover vs. Shares Traded",
       x = "Turnover (in Cr)",
       y = "Shares Traded")
```

Output 4:



Interpretation 4: A scatter plot comparing turnover to shares traded over time in the Nifty 50 index can provide insights into the relationship between trading activity and market value. We observe that, when 30,000 shares were traded and a turnover of 25,000 (in Cr) was achieved, it gives the average of last 3 months.

4. Candlestick Chart

Input 5:

```r
#2 Install and load required library
if (!require(ggplot2)) {
  install.packages("ggplot2")
}
library(ggplot2)

# Convert Date to a proper date format
data$Date <- as.Date(data$Date, format="%d-%b-%y")

# Create a candlestick chart using ggplot2
candlestick_chart <- ggplot(data, aes(x = Date)) +
  geom_segment(aes(x = Date, xend = Date, y = Low, yend = High), color = "black") +
  geom_segment(aes(x = Date, xend = Date, y = Open, yend = Close), color = "black", size = 2) +
  theme_minimal() +
  labs(title = "Candlestick Chart", x = "Date", y = "Price")

# Show the plot
print(candlestick_chart)
```

Output 5:

Interpretation 5:

A candlestick chart for the Nifty 50 provides a visual representation of price movements over a specific time.

The candlestick body represents the opening and closing prices, while the wicks indicate the high and low prices during the period.

This is a tool called Technical Analysis which is generally used in finance to analyze the trend of the market.