



# INNOMATICS

## RESEARCH LABS



# Share Market Analysis

By Jagrit Arora



# About Me

- \* I have completed my graduation in Instrumentation from Bhaskaracharya College of Applied Sciences, University of Delhi.
- \* Currently I am pursuing my Master's in Operational Research from Hansraj College, University of Delhi.
- \* I want to learn Data Science because it covers topics such as statistics, programming and mathematics which catch my interest. I want to develop my expertise in this field so that I can make use of it to enhance my career.

# **Business Statement**

**Analysis of the shares of firms of different sectors on the 20<sup>th</sup> of March, 2022 and assess the insights and trends of the market on that day.**

# Data Collection

# Step 1

- ❖ To extract the data for my analysis, I have selected the **Money Control** website(<https://www.moneycontrol.com>).
- ❖ Then I access to the webpage of **shares** from where I have gathered the data(<https://www.moneycontrol.com/india/stockpricequote/>).

This is how the webpage looks like. As you can see it contains the company name. Each name contains the link of that company's share performance

Company Name		
3M India	Aarti Drugs	Aarti Ind
AAVAS Financier	AB Capital	ABB India
Abbott India	ACC	Adani Enterpris
Adani Ports	Adani Power	Adani Total Gas
Adani Trans	Aditya Birla F	Advanced Enzyme
Aegis Logistics	AIA Engineering	Ajanta Pharma
Akzo Nobel	Alembic Pharma	Alkem Lab

# Step 2

❖ Then I accessed each of the hyperlinks of the firm and extracted the necessary information for the analysis. This information includes:

- Opening Price
- Previous Close
- Volume
- Market Capital
- High
- Low
- 52 Week High
- Upper Circuit
- Price Change
- Face Value

Open	<b>1,466.00</b>	High	<b>1,469.65</b>	TTM EPS	<b>65.01</b>	Mkt Cap (Rs. Cr.)	<b>799,899</b>
Previous Close	<b>1,479.25</b>	Low	<b>1,434.55</b>	TTM PE	<b>22.19</b>	Dividend Yield	<b>0.45</b>
Volume	<b>10,080,022</b>	UC Limit	<b>1,627.15</b>	Sector PE	<b>29.55</b>	20D Avg Volume	<b>10,386,413</b>
Value (Lacs)	<b>145,419.44</b>	LC Limit	<b>1,331.35</b>	Book Value Per Share	<b>379.55</b>	20D Avg Delivery(%)	<b>59.17</b>
ⓘ VWAP	<b>1,449.14</b>	52 Week High	<b>1,725.00</b>	P/B	<b>3.81</b>		
Beta	<b>1.08</b>	52 Week Low	<b>1,292.00</b>	Face Value	<b>1</b>		

# Data Frame

# The dataframe includes 471 rows & 20 columns

Volume	High	Low	Upper_Circuit	Lower_Circuit	High_52	Low_52	Face_Value	Market_Capital	State	Website
6295.0	2497.40	2415.10	2643.65	2163.05	2751.35	1876.70	10	1678646	Maharashtra	<a href="http://www.kfintech.com">http://www.kfintech.com</a>
0452.0	3710.00	3660.30	4021.45	3290.35	4043.00	2987.05	1	1358569	Maharashtra	<a href="https://www.tcplindia.co.in">https://www.tcplindia.co.in</a>
1977.0	1489.80	1470.55	1592.95	1303.35	1725.00	1292.00	1	820636	Maharashtra	<a href="http://www.datamaticsbpm.com">http://www.datamaticsbpm.com</a>
1459.0	1923.30	1833.05	2078.30	1700.50	1953.90	1311.30	5	780182	Karnataka	<a href="http://www.kfintech.com">http://www.kfintech.com</a>
9844.0	725.00	716.20	778.80	637.20	867.00	531.15	2	500279	Gujarat	<a href="http://www.3i-infotech.com">http://www.3i-infotech.com</a>
...	...	...	...	...	...	...	...	...	...	...
5209.0	421.00	404.25	488.00	325.40	725.00	292.80	10	2386	Punjab	<a href="http://www.alankit.com">http://www.alankit.com</a>
9001.0	164.90	160.00	193.40	129.00	324.00	152.10	1	2373	Rajasthan	<a href="http://www.kfintech.com">http://www.kfintech.com</a>
7390.0	464.95	455.00	545.45	363.65	785.15	416.85	2	2309	Maharashtra	<a href="http://www.kfintech.com">http://www.kfintech.com</a>
3880.0	73.70	71.00	86.15	57.45	114.45	67.85	10	2222	Maharashtra	<a href="http://www.linkintime.co.in">http://www.linkintime.co.in</a>
4811.4	37.50	37.05	0.00	0.00	0.00	0.00	0	20	Maharashtra	<a href="http://www.linkintime.co.in">http://www.linkintime.co.in</a>

# About Data Frame

- **Rank-** This is the rank of the firms with respect to the market capital i.e., the company with the greatest market capital has rank 1.
- **Company Name-** This is the registered name of the firms.
- **Sector-** This is the sector in which a particular company operates.
- **Share Name-** This is the name with which a firm is listed on the market i.e., NSE or BSE.
- **Current Price-** This is the price at which the share of any company is trading i.e., if you buy or sell any stock at this instant, then, this is the price that you have to pay or will receive after the completion of the order.

# About Data Frame

- **Previous Close**- This is the price at which the share was trading, when the market got closed on previous working day.
- **Opening Price**- This is the price at which the share was trading when the market opened on that day's morning.
- **Price Change**- This is the difference between the Opening Price and the Current Price of any particular share.

$$\text{PriceChange} = \text{OpeningPrice} - \text{CurrentPrice}$$

- **Percentage Change**- This is the percentage of Price Change with respect to the opening price.

$$\text{PercentageChange} = \frac{(\text{OpeningPrice} - \text{CurrentPrice})}{\text{OpeningPrice}} * 100$$

# About Data Frame

- **Volume-** This is the number of shares which have changed hands i.e., either number of shares which are sold or the number of shares which have been bought on any particular day.
- **High-** This is the highest price at which the share has traded on any particular day.
- **Low-** This is the lowest price at which the share has traded on any particular day.
- **Face Value-** This the value which is written on the face of the share certificate or it is the original cost of the stock, as listed on the share certificate.

# About Data Frame

- **Upper Circuit**- The topmost price beyond which the share cannot move up on a single day. It hits when there are all buyers & no/very few sellers.
- **Lower Circuit**- The price below which share cannot move down on a single day. It hits when there are all sellers & no/very few buyers.
- **High 52**- It is the highest price at which a particular stock has been traded since the last 52 weeks i.e., 1 year.
- **Low 52**- It is the lowest price at which a particular stock has been traded since the last 52 weeks i.e., 1 year.

# About Data Frame

→ **Market Capital**- It is calculated by multiplying the total number of shares with the market price per share. The market capital of Reliance Industries Ltd. is 16.78 lakh crores which is the greatest among all.

$$\text{MarketCapital} = \text{TotalShares} * \text{MarketPrice}$$

→ **State**- State where the registered office of the firm is located.

→ **Website**- Website of each of the firm.

# Data Cleaning

# Converting the data types and inputting the null values

## BEFORE CLEANING

```
RangeIndex: 471 entries, 0 to 470
Data columns (total 20 columns):
 #   Column           Non-Null Count  Dtype  
 ---  -- 
 0   Unnamed: 0        471 non-null    int64  
 1   Company_Name     471 non-null    object  
 2   Sector            471 non-null    object  
 3   Share_Name        469 non-null    object  
 4   Current_Price    469 non-null    object  
 5   Price_Change     469 non-null    float64 
 6   Percentage_Change 471 non-null    object  
 7   Opening_Price    471 non-null    object  
 8   Previous_Close   471 non-null    object  
 9   Volume            471 non-null    object  
 10  High              471 non-null    object  
 11  Low               471 non-null    object  
 12  Upper_Circuit    471 non-null    object  
 13  Lower_Circuit    471 non-null    object  
 14  High_52           471 non-null    object  
 15  Low_52            471 non-null    object  
 16  Face_Value        471 non-null    float64 
 17  Market_Capital   471 non-null    object  
 18  State             471 non-null    object  
 19  Website           444 non-null    object  
dtypes: float64(2), int64(1), object(17)
memory usage: 73.7+ KB
```



## AFTER CLEANING

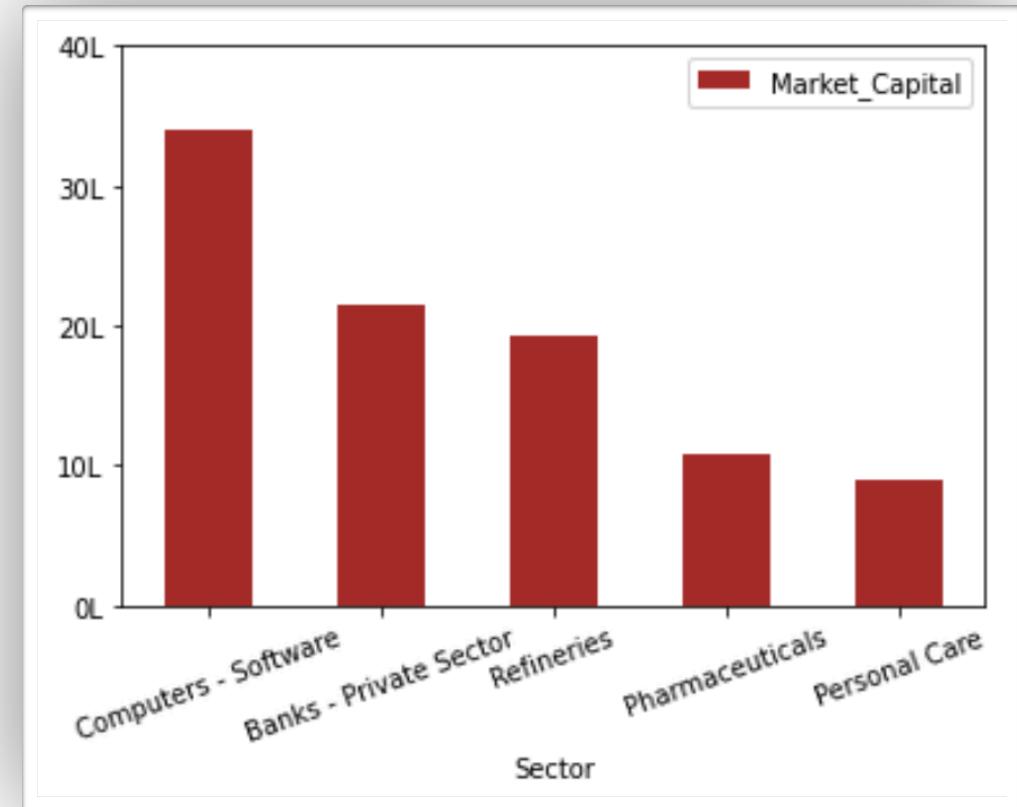
```
RangeIndex: 471 entries, 0 to 470
Data columns (total 19 columns):
 #   Column           Non-Null Count  Dtype  
 ---  -- 
 0   Company_Name     471 non-null    object  
 1   Sector            471 non-null    object  
 2   Share_Name        471 non-null    object  
 3   Current_Price    471 non-null    float64 
 4   Price_Change     471 non-null    float64 
 5   Percentage_Change 471 non-null    float64 
 6   Opening_Price    471 non-null    float64 
 7   Previous_Close   471 non-null    float64 
 8   Volume            471 non-null    float64 
 9   High              471 non-null    float64 
 10  Low               471 non-null    float64 
 11  Upper_Circuit    471 non-null    float64 
 12  Lower_Circuit    471 non-null    float64 
 13  High_52           471 non-null    float64 
 14  Low_52            471 non-null    float64 
 15  Face_Value        471 non-null    int64  
 16  Market_Capital   471 non-null    int64  
 17  State             471 non-null    object  
 18  Website           471 non-null    object  
dtypes: float64(12), int64(2), object(5)
memory usage: 70.0+ KB
```

# Data Analysis

# Top 5 sectors in terms of market capitalisation

Firstly, I used **groupby** function on the **sectors** with **sum** as the aggregate function. Then, I **sorted** the **sectors** with respect to the **market capital** in the descending order. **After sorting** a **bar graph** of the **top 5 sectors** was made.

**INTERPRETATION-** IT sector is leading with a market capital of more than 30 Lakh Crores followed by the Private Banking with a market capital of approximately 20 Lakh Crores.



# Top 5 most profitable shares in terms of opening price

Here, I have **sorted** the **shares** with respect to the **percentage change** in the descending order.

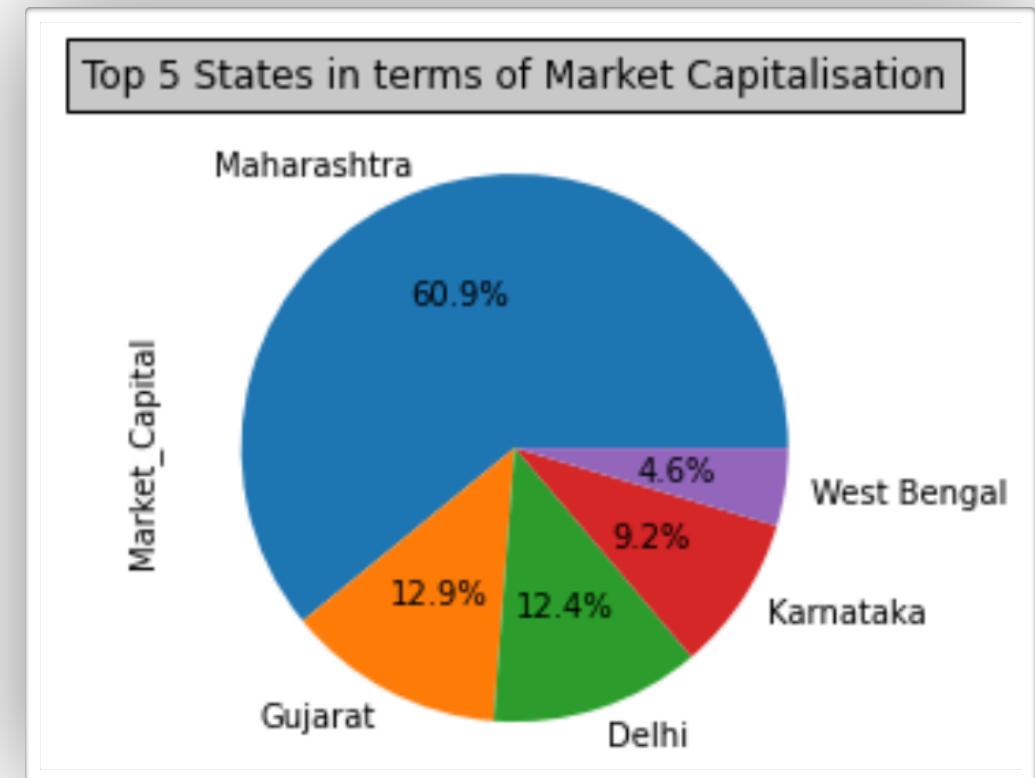
**INTERPRETATION-** On March 20, 2022, IFB Industries Ltd. has gained more than any company(13.22% greater than it's opening price).

Rank	Company_Name	Percentage_Change
425.0	IFB Industries Ltd.	13.22
286.0	KEI Industries Ltd.	12.68
262.0	Brigade Enterprises Ltd.	10.47
421.0	Greaves Cotton Ltd.	8.74
316.0	EIH Ltd.	8.45

# Top 5 states in terms of market capitalisation

Firstly, I used **groupby** function on the **states** with **sum** as the aggregate function. Then, I **sorted** the **states** with respect to the **market capital** in the descending order. **After sorting** a **piechart** of the **top 5 states** was made.

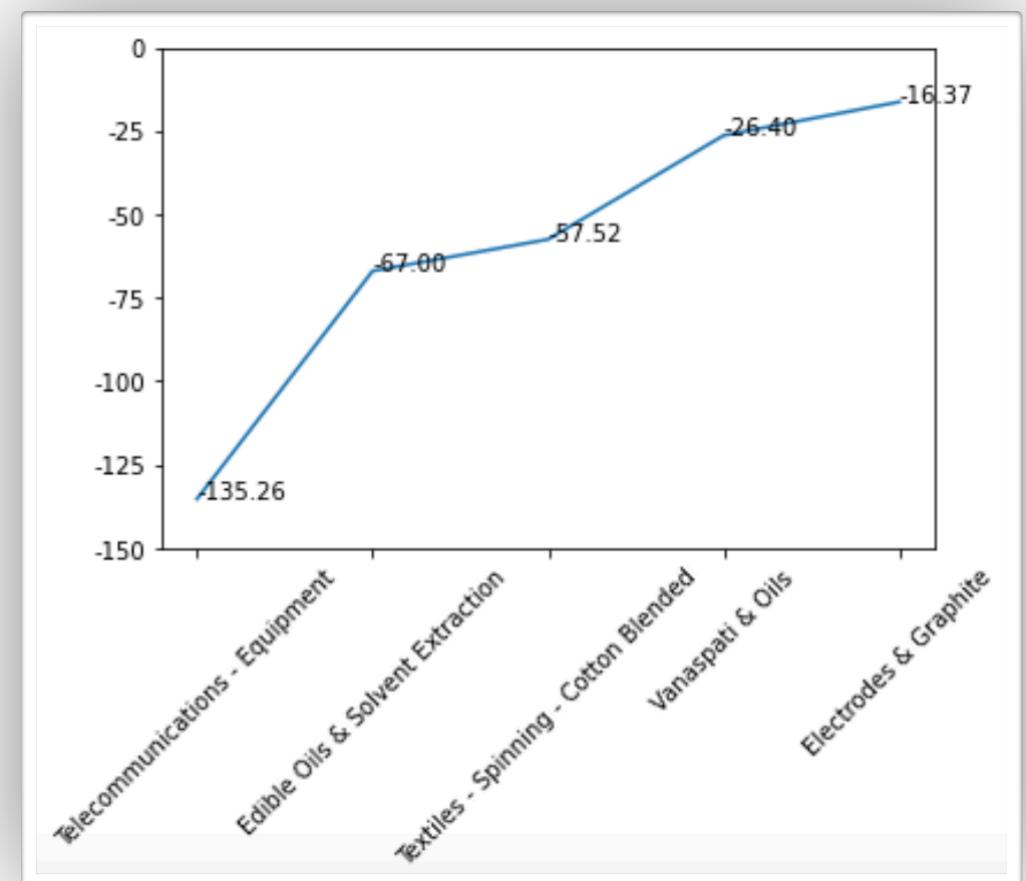
**INTERPRETATION-** Most of the market capital is in the hands of the firms of Maharashtra, followed by Gujarat and Delhi.



# Top 5 loss bearing sectors in terms of price change

Firstly, I used **groupby** function on the **sectors** with **mean** as the aggregate function. Then, I **sorted** the **sectors** with respect to the **price change** in the ascending order. **After sorting** a **line graph** the **top 5 sectors** was made.

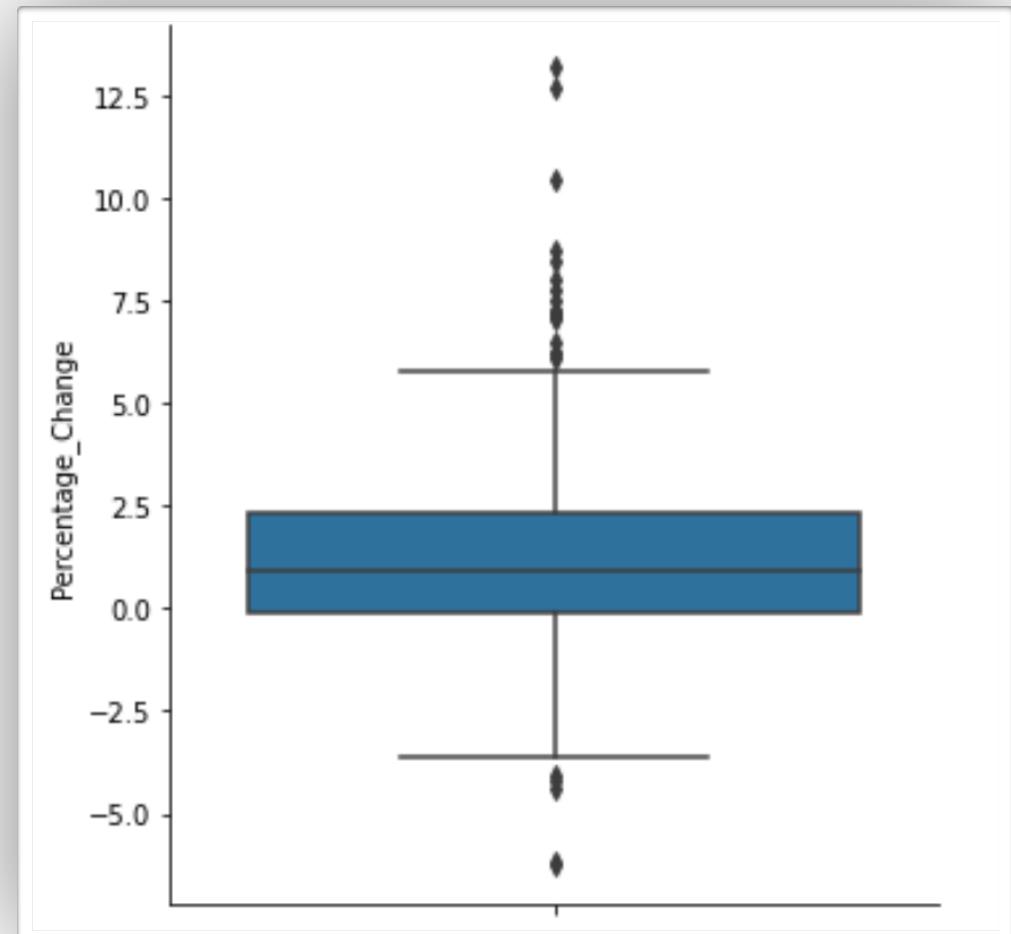
**INTERPRETATION-** On March 20, 2022, the telecommunication sector's share has lost the most which is ₹135.26 i.e., its per share price has been decreased by ₹135.26 from its opening price.



# Box plot of percentage change

Here, I have shown a **box plot** of **percentage change** of the shares of all 171 firms.

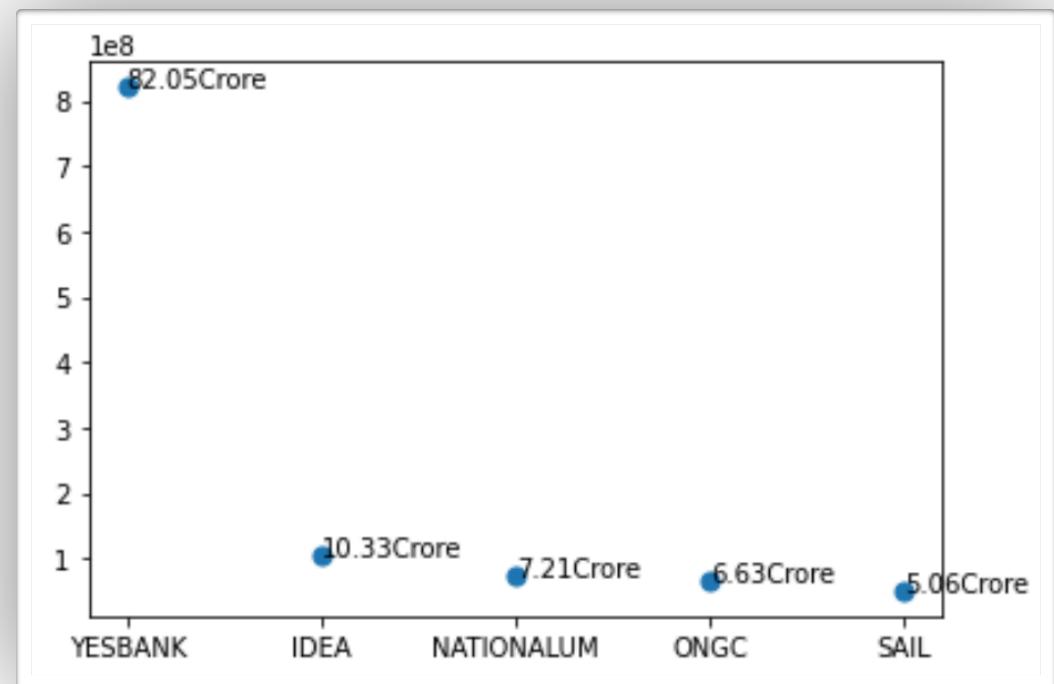
**INTERPRETATION-** The middle 50% of the share's price changed in the range 0 to 2.5% and the median is around 1%. There are a lot more outliers at the positive side as compared to the negative side.



# Top 5 traded shares with respect to volume

Firstly, I **sorted** the **shares** with respect to the **volume** in the descending order. **After sorting** a **scatter plot** of the **top 5 shares** was made.

**INTERPRETATION-** On March 20, 2022, the YES Bank share was traded the most and its volume was 82.05 Crores i.e., 82.05 Crores shares of YES Bank have changed the hands.



# A count plot in terms of the face value

Firstly, I have checked the value counts of the **unique** entries in the **face value** column. Then a **count plot** was made from those entries.

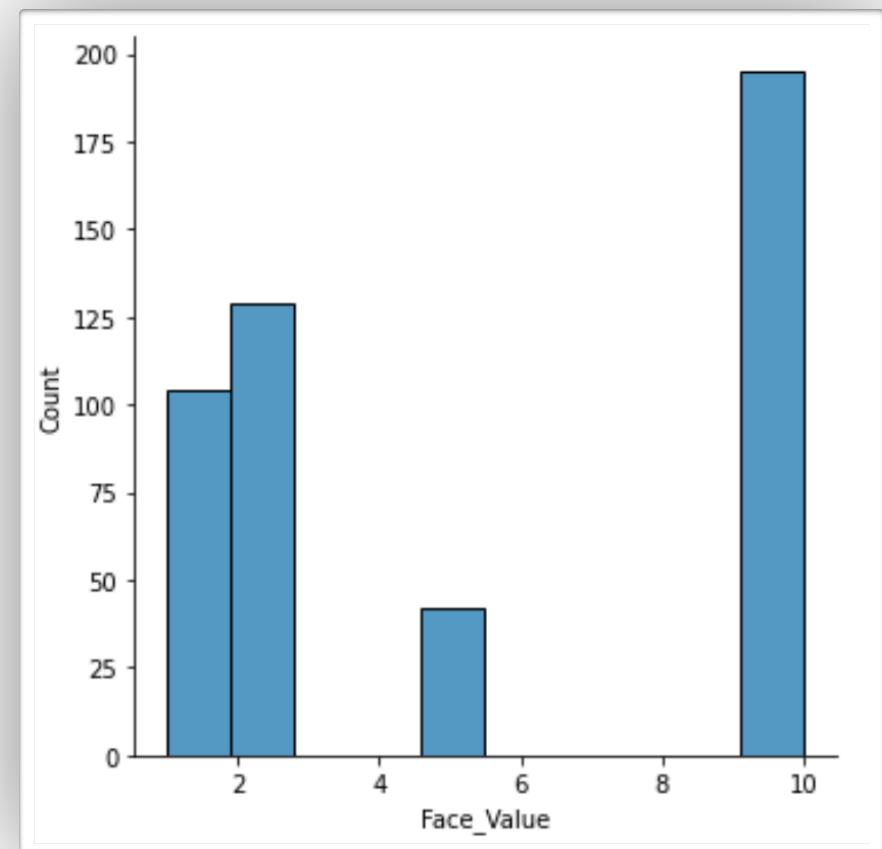
**INTERPRETATION-** Most of the shares have the face value of ₹10 and some have the face value of ₹2 and ₹1 but a very few are having ₹5 as the face value.

Value Counts



Face_Value	
10	195
2	129
1	104
5	42

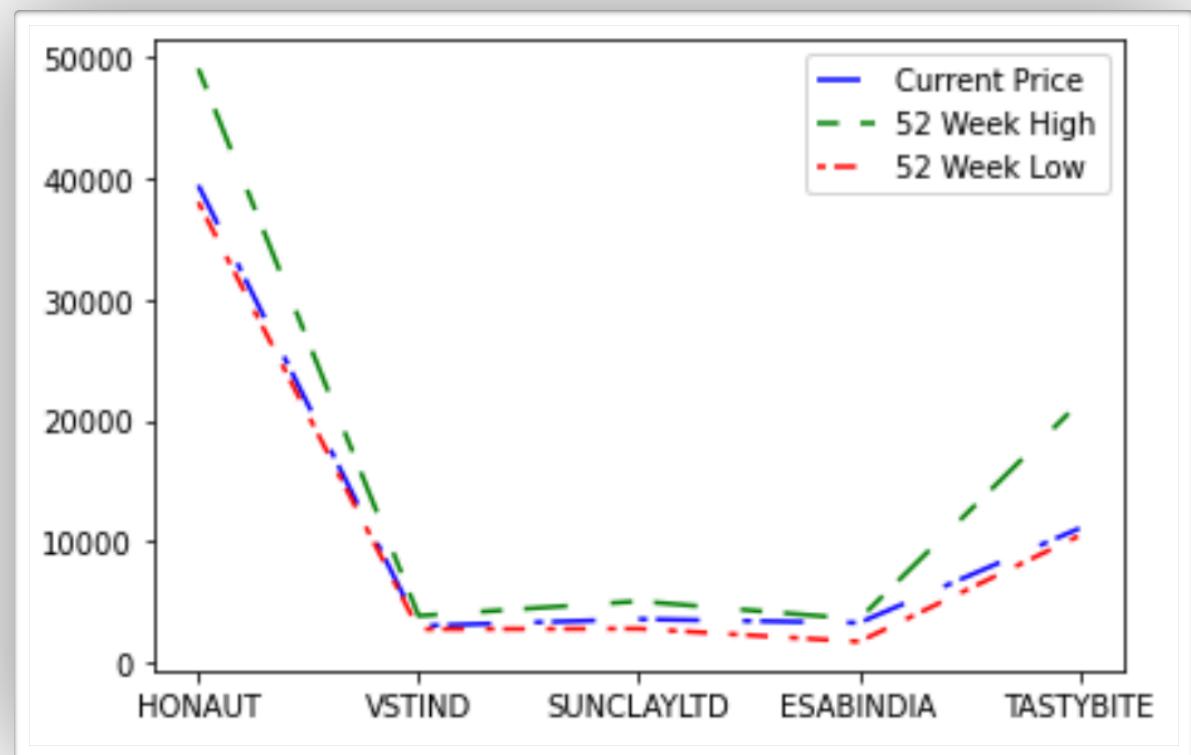
dtype: int64



# Relation between High\_52, Low\_52 & Current\_Price of bottom 5 companies with respect to Volume

Firstly, I **sorted** the **firms** with increasing **volume**. After that a **line chart** of **High\_52**, **Low\_52** and **Current\_Price** of **top 5 firms** was made.

**INTERPRETATION-** There has not been any considerable alteration in the prices since the past 52 weeks i.e, 1 year.

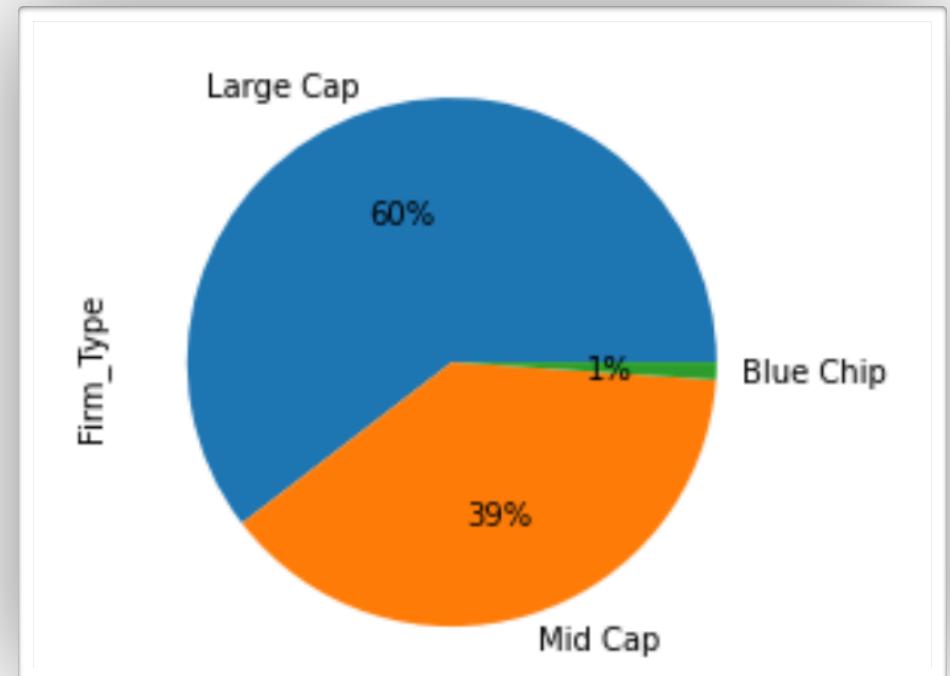


# Add feature named as Firm\_Type and make a pie chart

Here, I have **added** the **Firm\_Type** **feature** with the following conditions:-

```
Blue Chip(Market Capital) > 1M crores  
1M crores < Large Caps(Market Capital) > 10K crores  
Mid Caps(Market Capital) < 10K crores
```

**INTERPRETATION-** On March 20, 2022, the dataframe contained only 1% Blue Chip firms while 60% Large and 39% Mid caps firms.



**Value Counts**

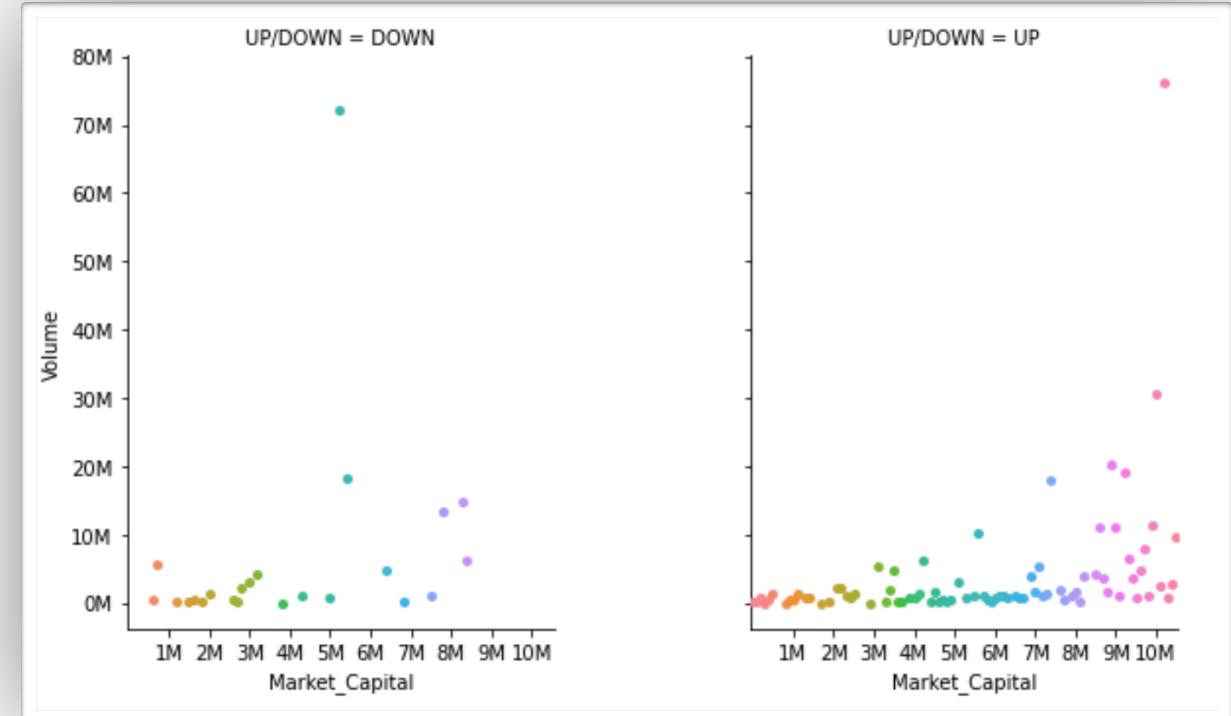
```
Large Cap    284  
Mid Cap     181  
Blue Chip      5  
Name: Firm_Type, dtype: int64
```

# Add a feature named as UP/DOWN then make a swarm plot on volume & market capital after grouping the sectors

Firstly, I used **groupby** function on the **sectors** with **mean** as the aggregate function. Then, I **added** the **UP/DOWN feature** with the following conditions:-

UP if percentage change  $\geq 0$   
DOWN if percentage change  $< 0$

**INTERPRETATION-** Overall, the share price of most of the sectors has increased, except for a few. While, the share price of the sectors having a market capital of more than 8.5 million crores witnessed only an increase with no loss at all.



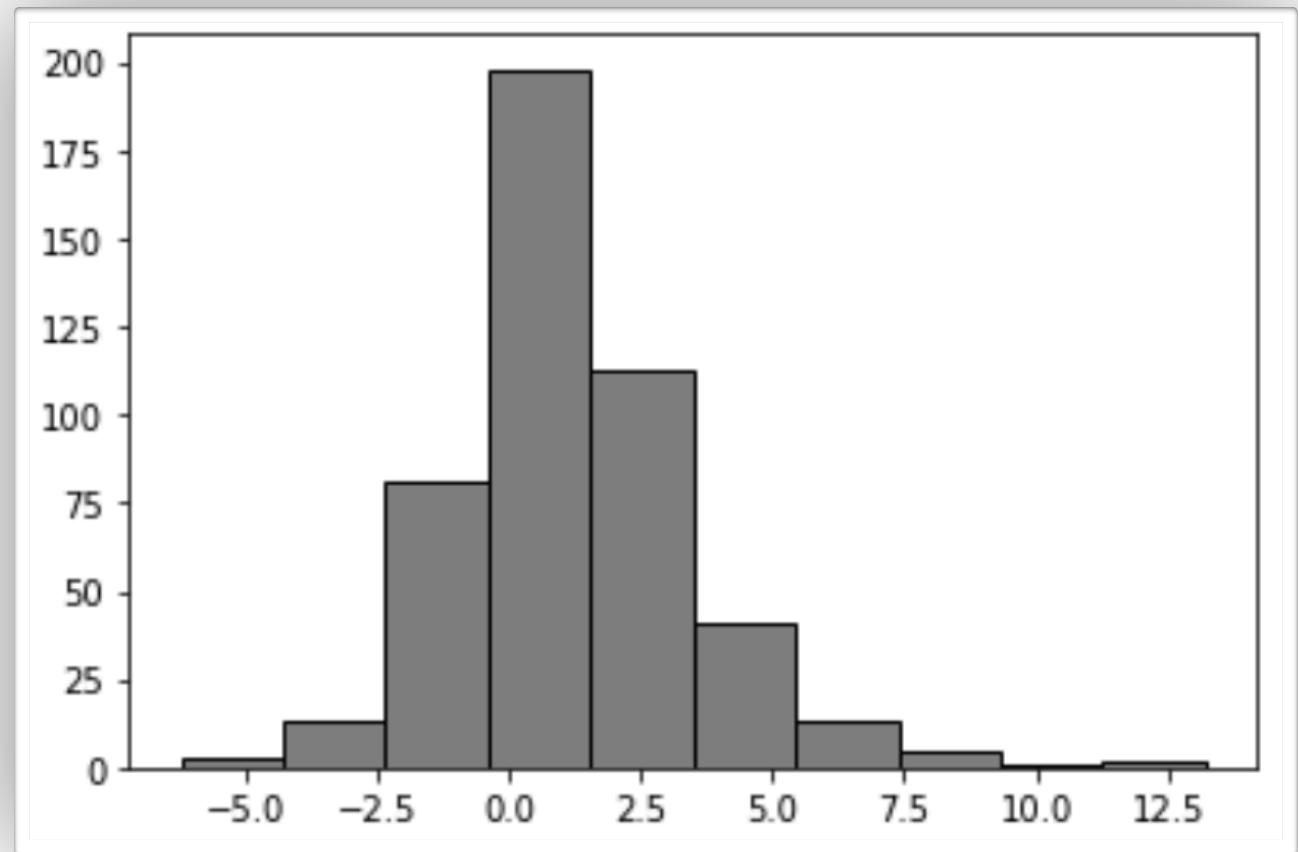
Value Counts

```
UP      83  
DOWN    23  
Name: UP/DOWN, dtype: int64
```

# Histogram of percentage change

Here, I have used the **plt.hist** function of **matplotlib** library on the **percentage change** feature of the dataframe.

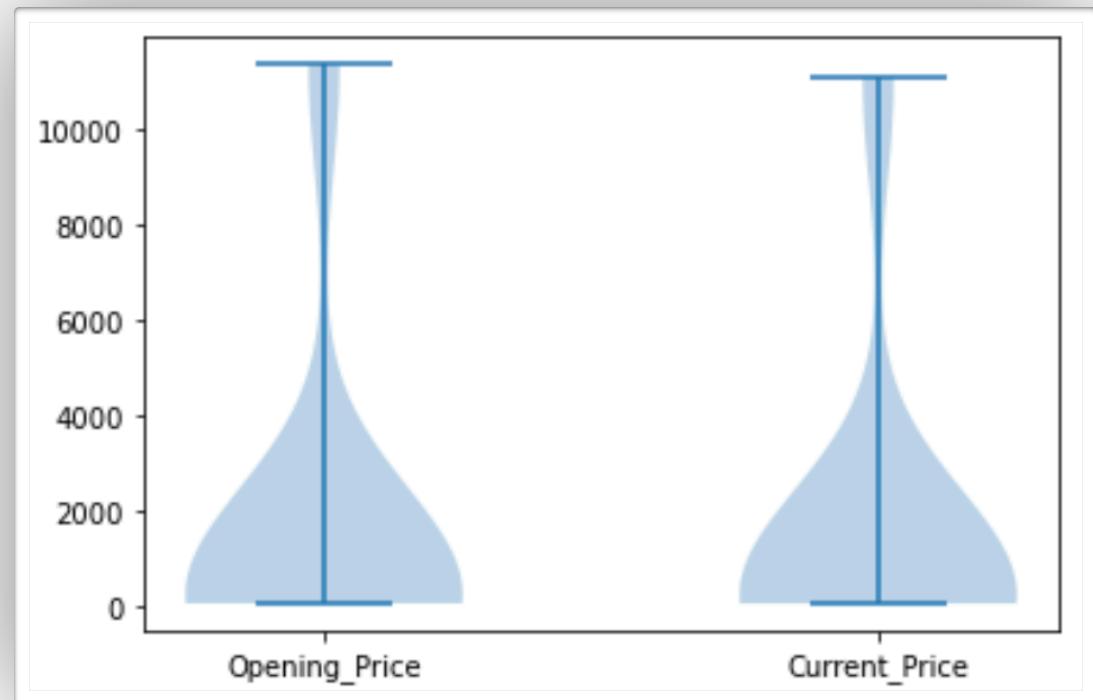
**INTERPRETATION-** Most of the share price's have increased but the change is minimal.



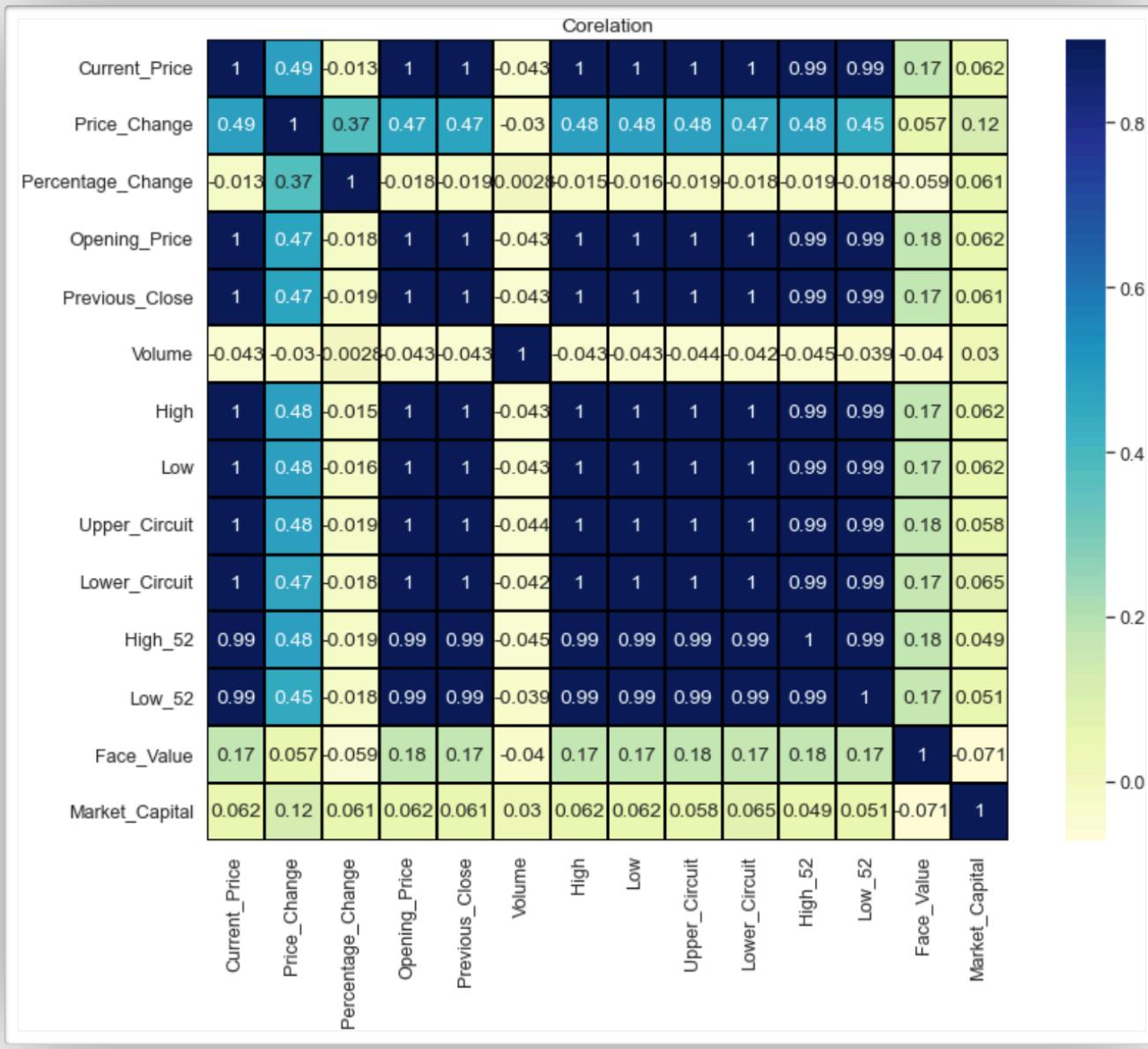
# Make a violin plot of opening price and current price of top 10 firms

Firstly, I **sorted** the **firms** with respect to their **ranks**. After that I made **violin plot** of the **top 5 firms** with respect to the **opening price** and **current price**.

**INTERPRETATION-** While observing the plot, we can interpret that there has not been any big change in the share price of top 10 firms in terms of market capital.



# Heat Plot



# Conclusion

On **20<sup>th</sup> March 2022**, the **market** was on **bullish** mode where **most of the shares** followed a **gain**, but that **percentage gain** was **minimal**.

The **YES bank** share was **traded** the **most**. On the other hand, the **telecommunication sector's** share has **lost** the **most**.

The **IT sector** was on the lead with the **greatest market capital**.

# Thank You...