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PROJECT REPORT



Yaswanth Ambati

**KODURU ADITYA RAM
RAJEEV
AKHILA
MOHAM SAI**

ANALYSING NIFTY INDICES : CORONA PERIOD

OUT LINE OF OUR PROJECT

This project is about analysing behaviour of Nifty equity indices during the COVID-19 pandemic by calculating key statistical factors. Using historical stock price data for these indices like Nifty 50 and Nifty Bank, the study covers the period around the pandemic's time (e.g., March 2020). Statistical analysis includes calculating the daily mean from high, low, open, and close prices (from data in pandemic period), and determining overall mean and median. Additionally, coefficient of skewness is analysed to assess the direction of price distribution, and kurtosis is used identifying risk and volatility. And to observe behaviour of indices on certain important dates.

NOTE : We used **matplotlib** to create plots and python to implement logics.

Important Nifty Equity Indices taken:

1. Nifty 100
2. Nifty Next 50
3. Nifty Bank
4. Nifty Auto
5. Nifty 50
6. Nifty 500
7. Nifty Midcap 50
8. Nifty pharma
9. Nifty MNC
10. Nifty Infra
11. Nifty Finance

Code we used :

<https://drive.google.com/file/d/1e1lgCmJ3ibEte-yG5veLJ09GQ7OWEVvw/view?usp=sharing>

DATA COLLECTION (PHASE -1)

For data collection we went through different finance websites including go to website - investing.com , www.nseindia.com .

We collected data of important indices from beginning of pandemic (March-01-2020) to end of 1st wave of Corona (Nov-30-2020) .

The collected raw data includes “Opening price ”,”Closing Price ”,” Daily High”, ”Daily Low” for each trading day.

DESCRIPTIVE STATISTICS (PHASE-2)

For each trading day in the data we have four values called opening value, closing value, daily high and low. As we can't deal with four different values, so we focus on a single value called average price or **mean price**.

$$\text{Mean price} = \text{open} + \text{close} + \text{high} + \text{low} / 4$$

```
starting,ending=ff.split('Historical')
data['Daily Mean']=0.00
for i in range(0, data.shape[0]):
    str1,str2=data.loc[i,"Price"].split(',')
    str3,str4=data.loc[i,"Open"].split(',')
    str5,str6=data.loc[i,"High"].split(',')
    str7,str8=data.loc[i,"Low"].split(',')
    mean=(float(str1+str2)+float(str3+str4)+float(str5+str6)+float(str7+str8))/4
    data.loc[i,'Daily Mean']=mean
styled=data.style.map(lambda x: 'font-weight: bold', subset=['Daily Mean'])
try:
    data=data.drop('Vol', axis=1)
```

COMPUTATION (PHASE-3)

Need of computation : Calculating daily mean for 6 months and evaluating all statistical indicators for every index is impossible without computation.

1. Calculating mean and median :

This is the code snippet

```
len=data.shape[0]
mean=0
for i in range(0, data.shape[0]):
    mean=mean+data.loc[i,'Daily Mean']
mean=mean/len
mean=float(int(mean*100)/100)
if len%2 !=0 :
    median=data.loc[int(len/2),'Daily Mean']
else:
    median=(data.loc[int(len/2),'Daily Mean']+data.loc[int(len/2)-1,'Daily Mean'])/2
median=float(int(median*100)/100)

#calculating moments abt mean
```

2. Calculating Moments (Coefficient of skewness and kurtosis) :

$$\text{Skewness} = (1/n)(\sum (x_i - \text{mean})^3)$$

It indicates how much the distribution deviates from a symmetrical distribution. It simply measures relative position of mean and median.

Positive Skewness: Meaning there are more frequent smaller values but fewer large gains.

Negative Skewness: Meaning there are more frequent small gains but occasional large losses

After computing all the statistical factors, a graph of the share prices is created using Matplotlib.

$$\text{Kurtosis} = (1/n)(\sum (x_i - \text{mean})^4)$$

```
mue2=0
mue3=0
mue4=0
for i in range(0, data.shape[0]):
    temp=data.loc[i,'Daily Mean']-mean
    mue2=mue2+temp*temp
    mue3=mue3+temp*temp*temp
    mue4=mue4+temp*temp*temp*temp
mue2=mue2/len
mue3=mue3/len
mue4=mue4/len

temp=math.sqrt(mue2)
# print(mue3)
# print(mue2)
# print(temp)
coefficient_of_skewness=mue3/(temp*temp*temp)
kurtosis=mue4/(mue2*mue2)

coefficient_of_skewness=float(int(coefficient_of_skewness*100)/100)
kurtosis=float(int(kurtosis*100)/100)
```

Code we used :

<https://drive.google.com/file/d/1e1lgCmJ3ibEte-yG5veLJ09GQ7OWEVvv/view?usp=sharing>

GRAPHS AND REPRESENTATION (PHASE-4)

These are some of the graphs (outputs of our code)

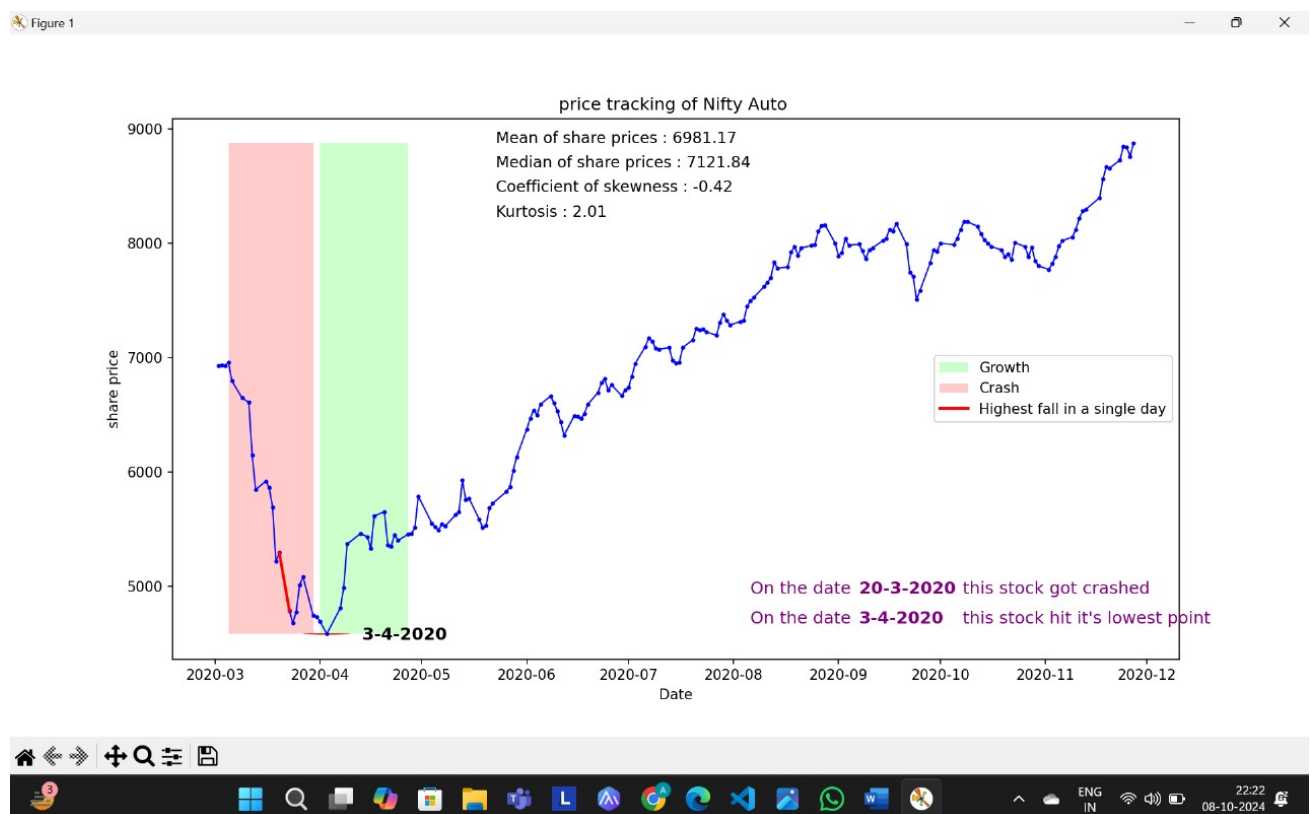
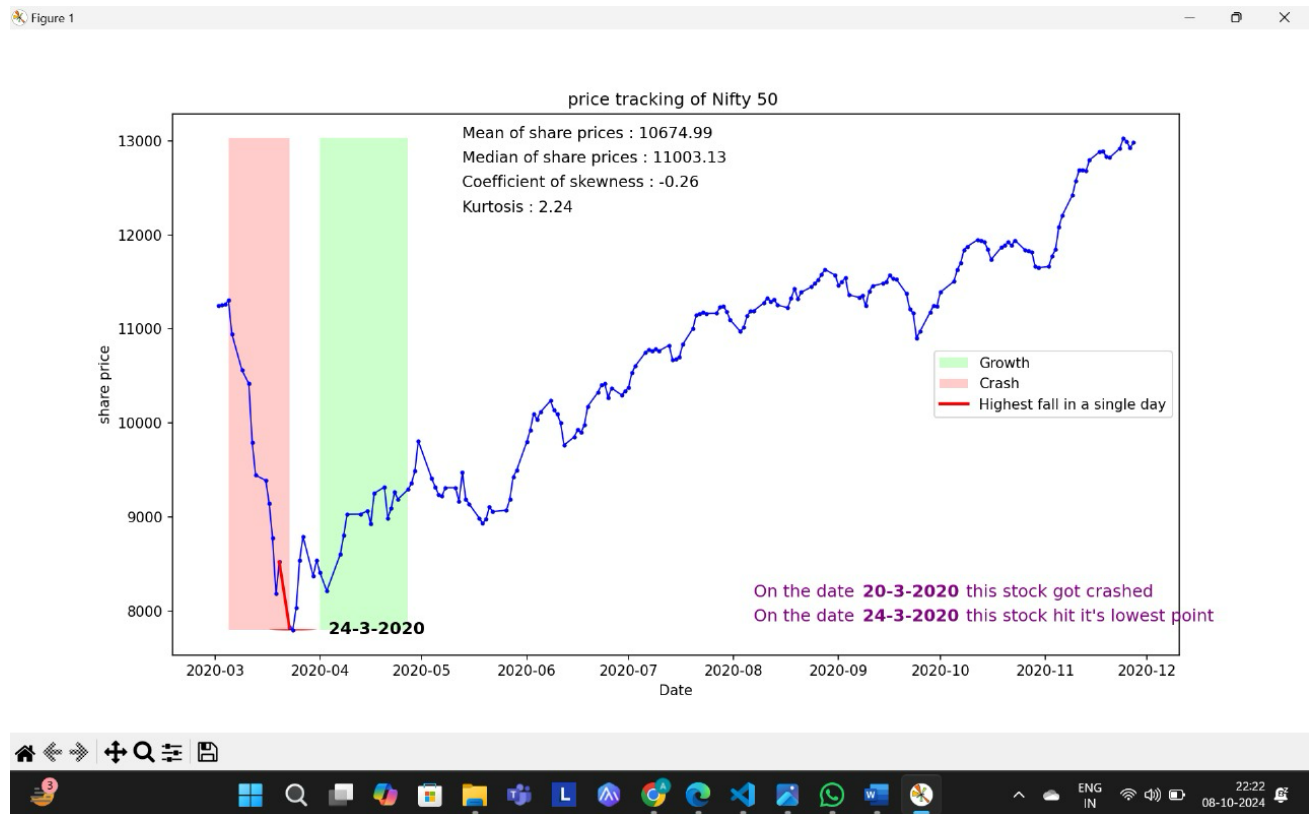


Figure 1

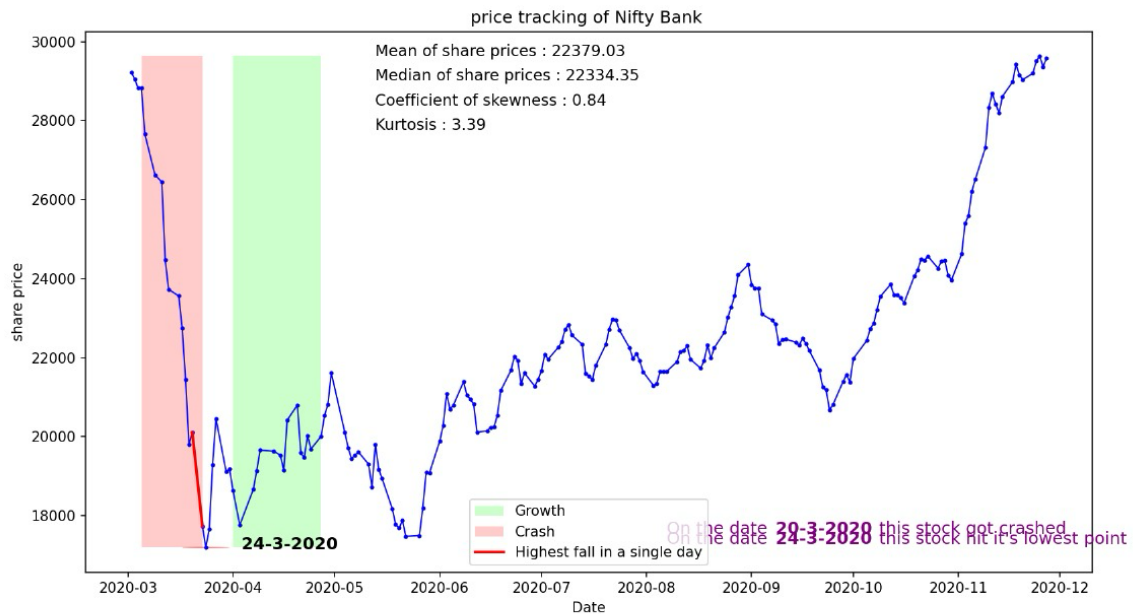


Figure 1

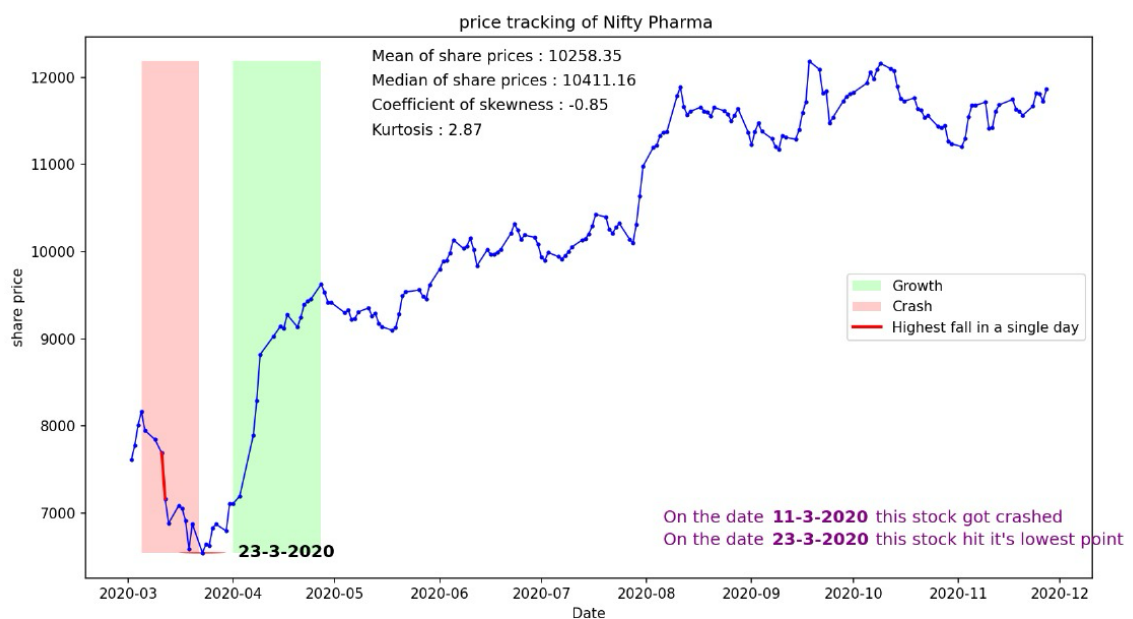


Figure 1

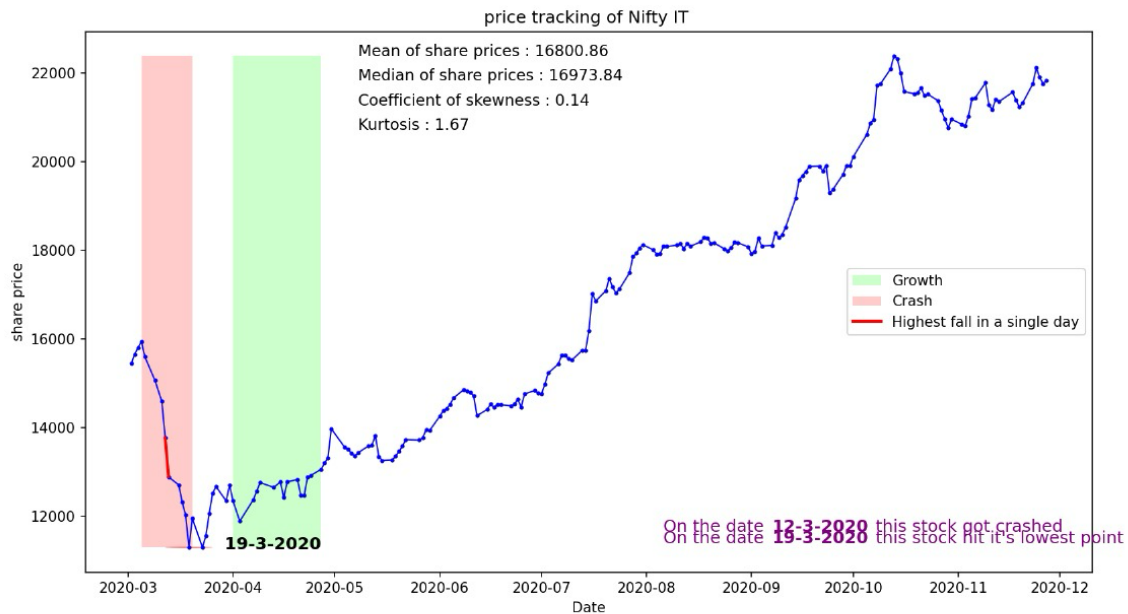
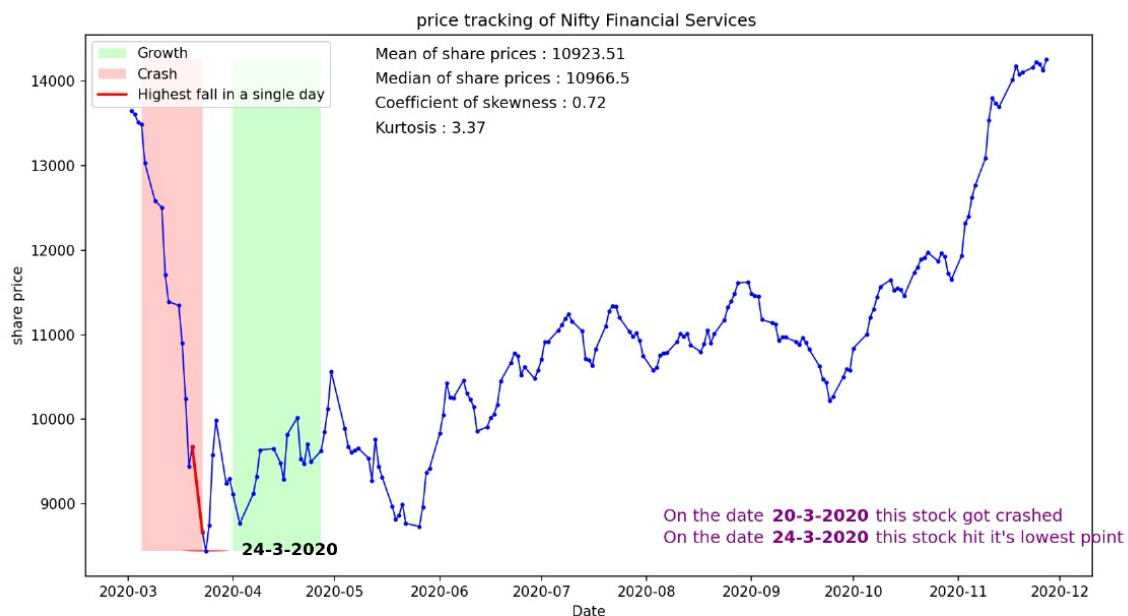


Figure 1



CONCLUSION

While every sector is struggling to get recovered, there are some sectors which saw a rapid growth in pandemic like [Nifty Pharma](#) and [Nifty IT](#).

In March, every index experienced a significant crash due to the rising number of COVID-19 cases in India. To make the situation worse, the WHO announced that it would take at least 18 months to develop a vaccine for the virus ([Red area in the graph](#)).

Most of the stocks exhibit a negative third moment about the mean (coefficient of skewness), indicating that the crash due to COVID-19 was so significant that the median is substantially higher than the mean. This negative coefficient of skewness suggests that a few very small values contributed to the skewness, highlighting the disproportionate impact of extreme losses on the overall distribution.

The graph illustrates the highest drop in stock prices in a single day and the lowest stock price values for each index. By analysing these days we conclude...

On March 11, the WHO declared COVID-19 a global pandemic.

On March 24, the Indian Prime Minister announced a complete 21-day lockdown.

The impact of these events is clearly reflected in the graph!!

Every stock experienced a significant crash on March 11, 2020, and March 24, 2020.

In April 2020, the Government of India implemented several measures to revive the economy, including a cut in interest rates by the RBI.

Additionally, the Prime Minister announced a scheme called Pradhan Mantri Garib Kalyan Yojana to assist the poor in meeting their daily needs.

Indices reacted positively to the measures taken by the RBI and the Indian Government, resulting in a slight recovery in equity indices.(Green region).

REFERENCES

Matplotlib : https://matplotlib.org/stable/gallery/lines_bars_and_markers/

Data collection: <https://www.nseindia.com/>