

LAB 9

JWALIT

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Q1)

Data for following companies (from nsedata1) are taken for the analysis: 1. Maruti 2. ONGC 3. Tech mahindra 4. Infosys 5. Wipro 6. NSE Index (NIFTY 50)

Q2)

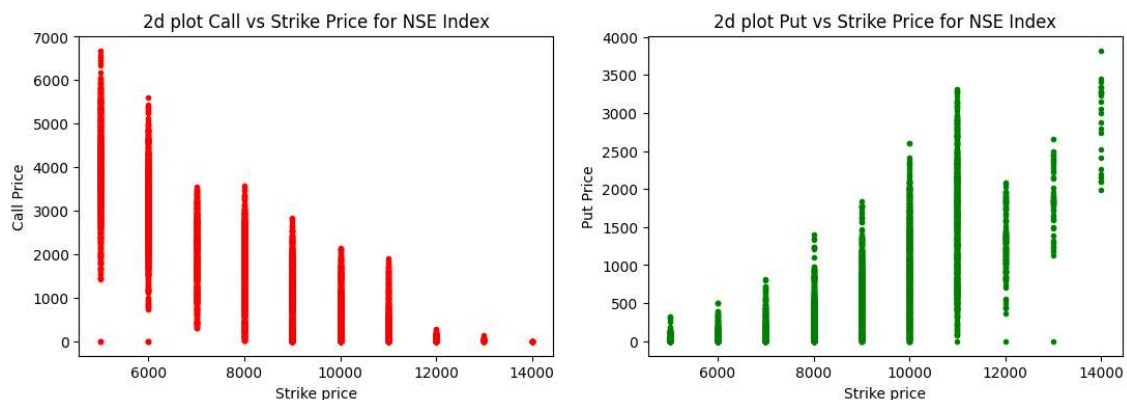
Observations –

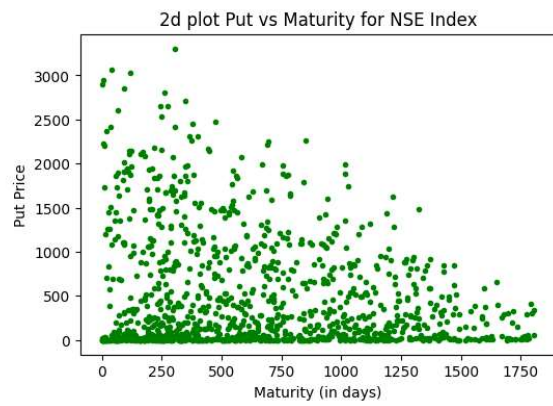
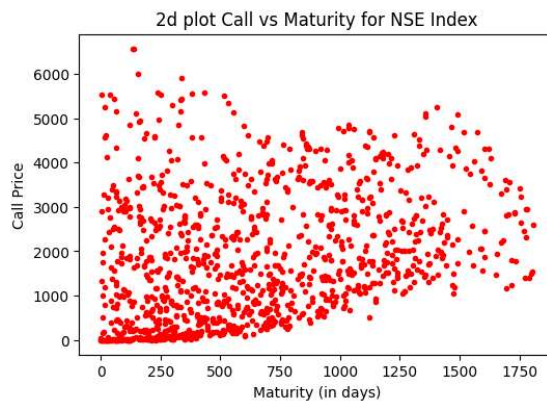
1. The lack of sufficient data adds difficulty in making proper analysis, but general trends can be figured out by considering the plots for NIFTY50 since it has larger data-points. The other plots also show similar trends.

2. We can observe that the price of call option decreases and that of put option increases with an increase in strike price. This trend is within our expectations.

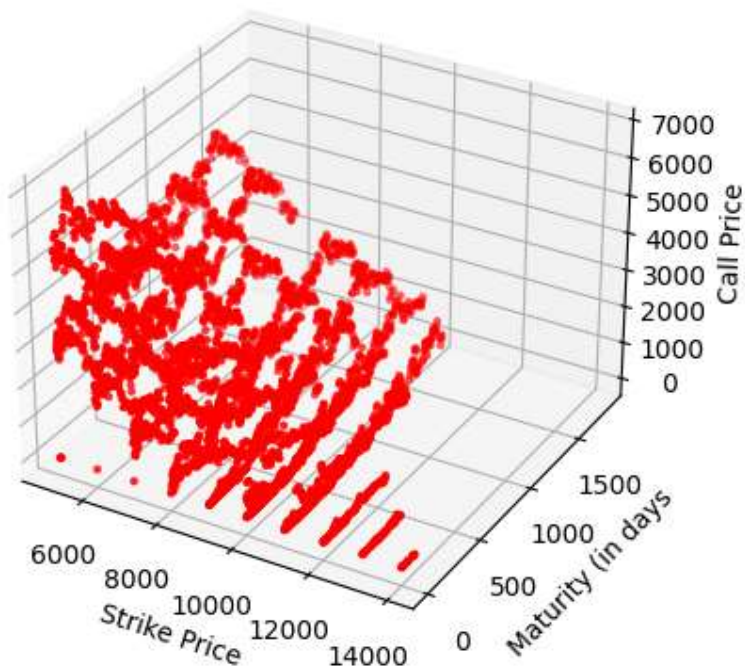
3. But the plot for call option and put option doesn't exactly match with our expectations. The general trend is that the price of call option tends to increase while that of put option tends to decrease with an increase in maturity period.

4. Apart from the strike price and maturity period, the options value also seems to depend on when the price was collected. This means that even if the period values are same, the prices may differ if they are collected at different point of time (e.g., collection from 1st Jan 2018 – 31st Dec 2018 will show different price from that of 1st Jan 2019 – 31st Jan 2019 even if all the parameters are kept same). This is due to the fact that the real market has several other random components, which affect the prices. Owing to this reason only, the scatter plots are constructed to capture all these factors.

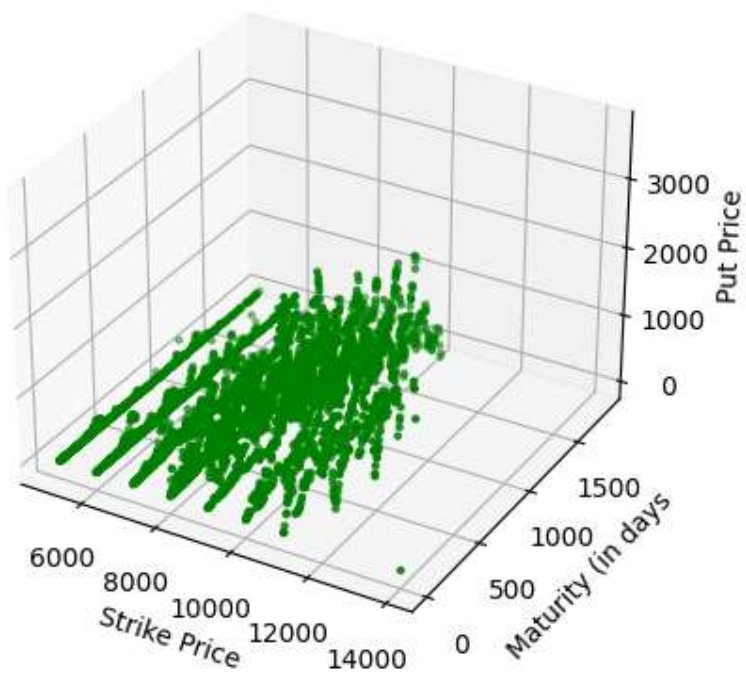




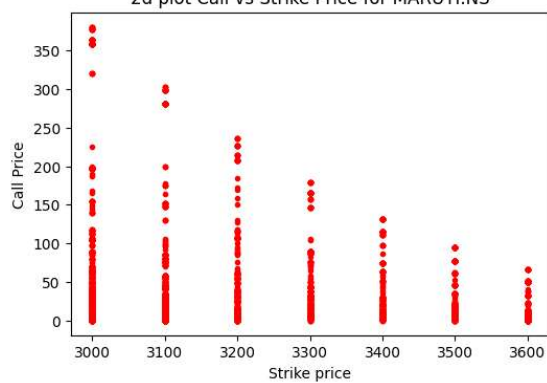
Call Option(3d plot) - NSE Index



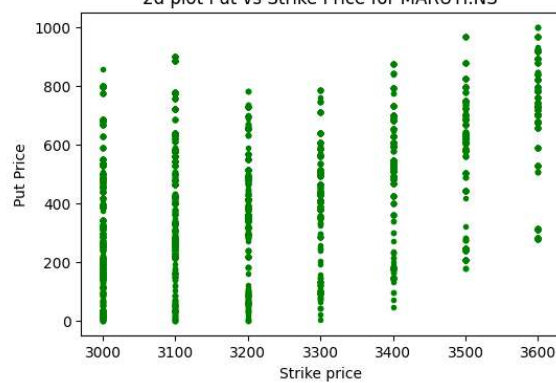
Put Option(3d plot) - NSE Index



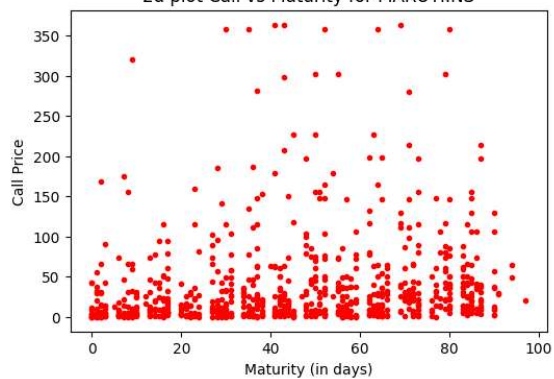
2d plot Call vs Strike Price for MARUTI.NS



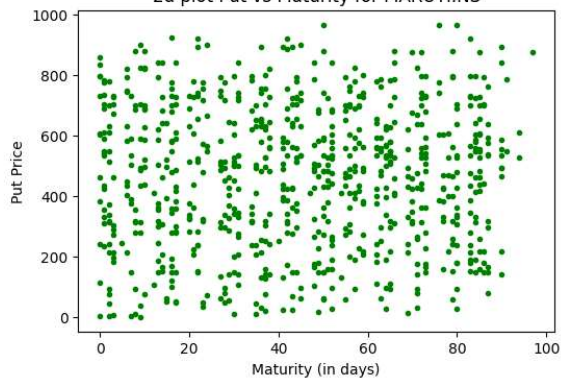
2d plot Put vs Strike Price for MARUTI.NS



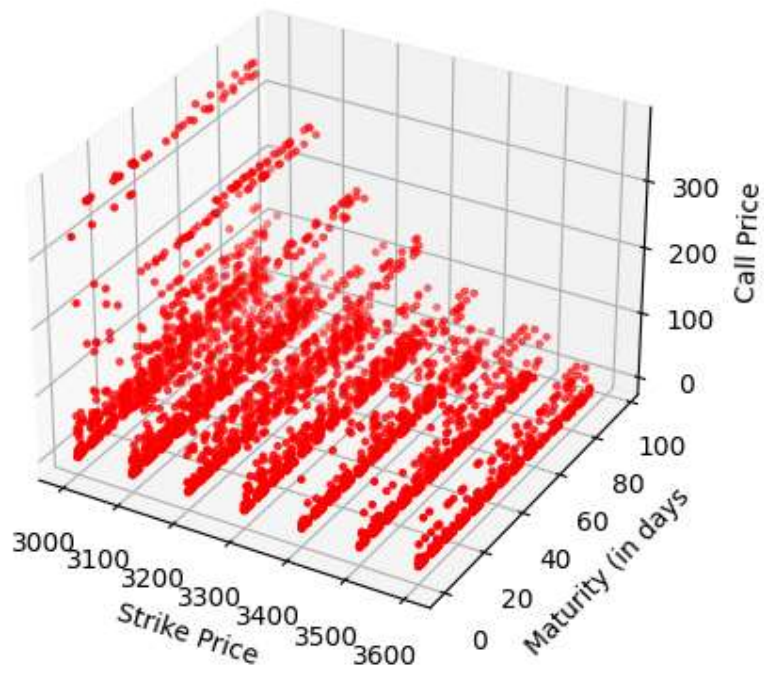
2d plot Call vs Maturity for MARUTI.NS



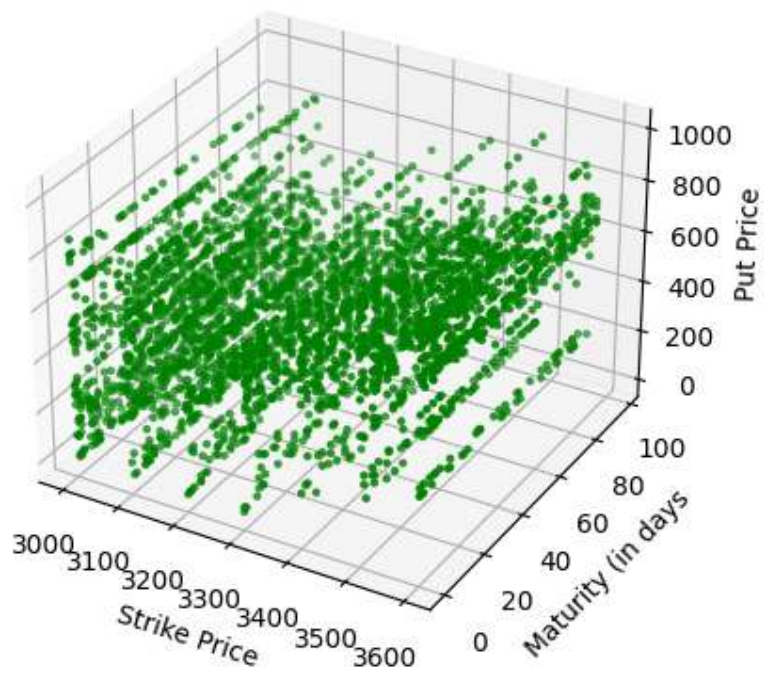
2d plot Put vs Maturity for MARUTI.NS

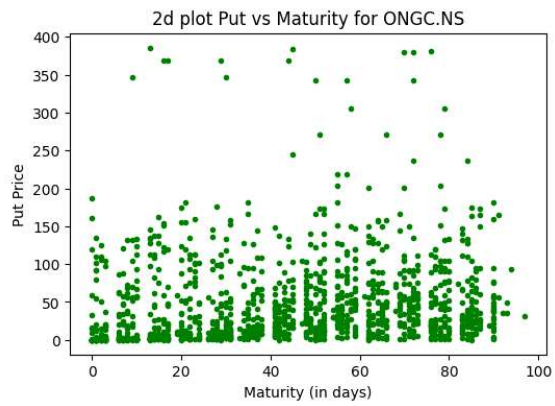
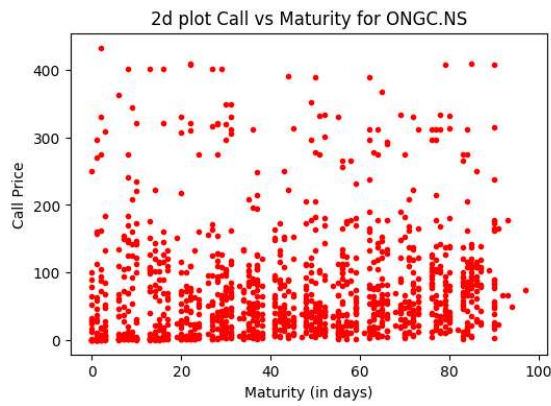
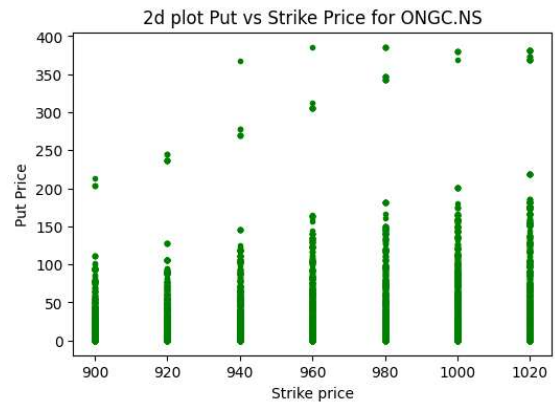
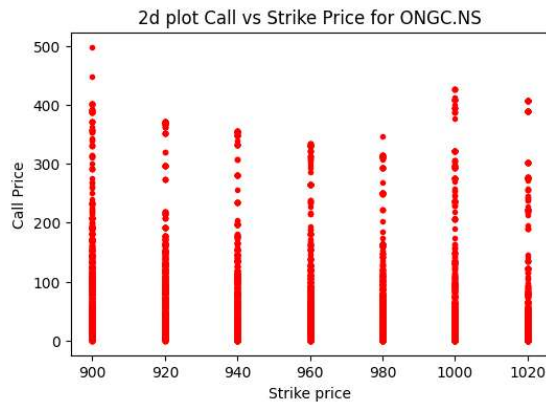


Call Option(3d plot) - MARUTI.NS

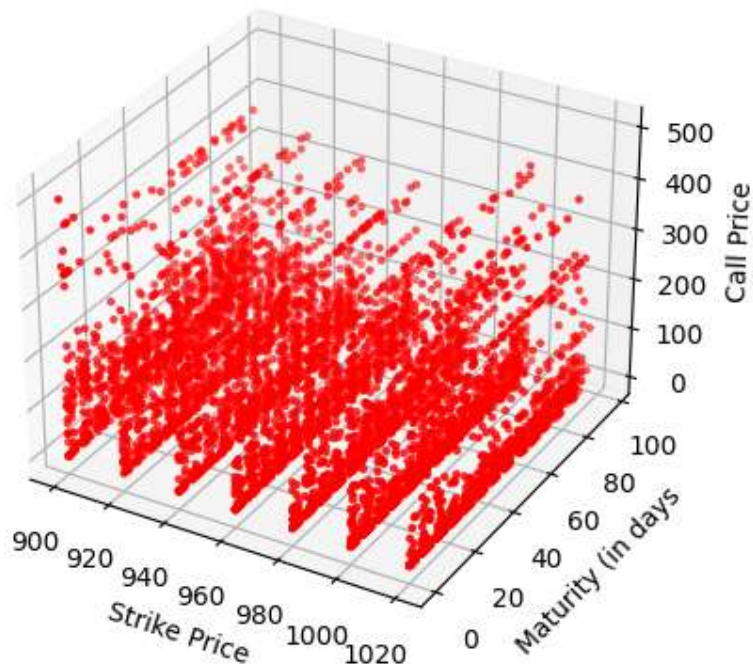


Put Option(3d plot) - MARUTI.NS

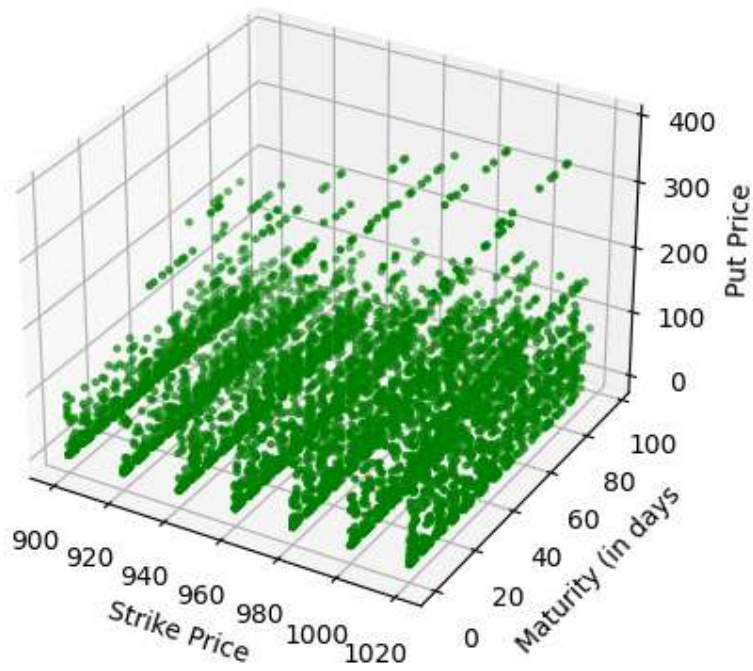




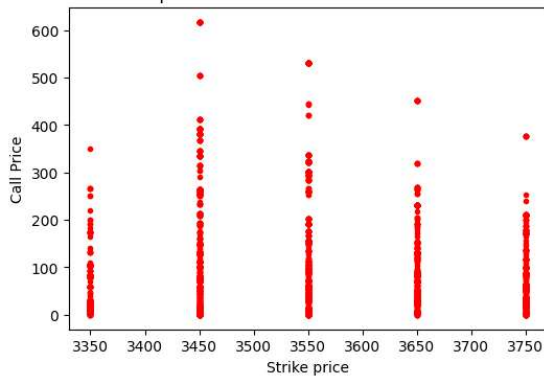
Call Option(3d plot) - ONGC.NS



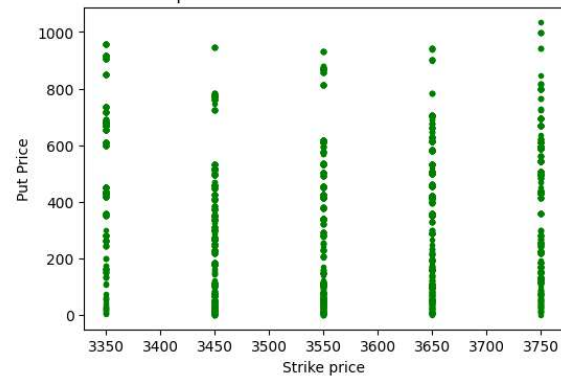
Put Option(3d plot) - ONGC.NS



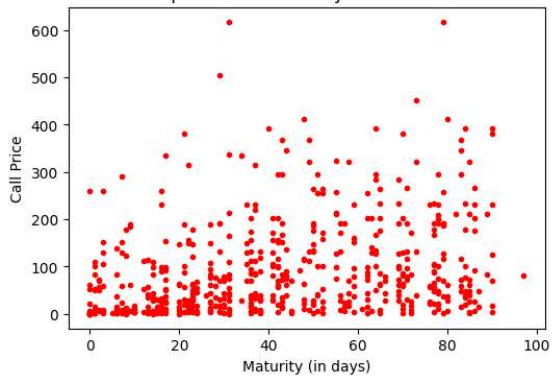
2d plot Call vs Strike Price for TECHM.NS



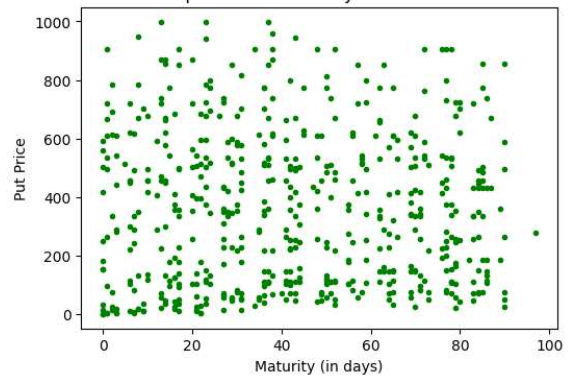
2d plot Put vs Strike Price for TECHM.NS



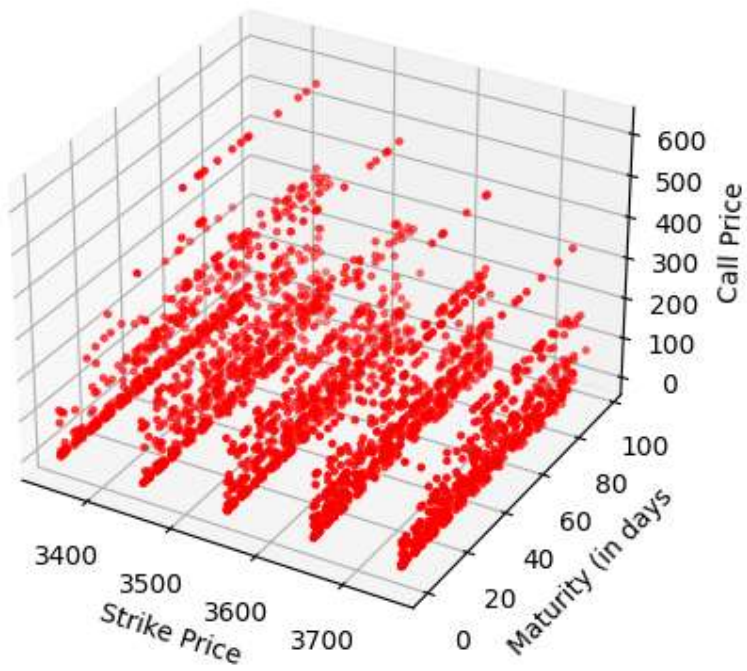
2d plot Call vs Maturity for TECHM.NS



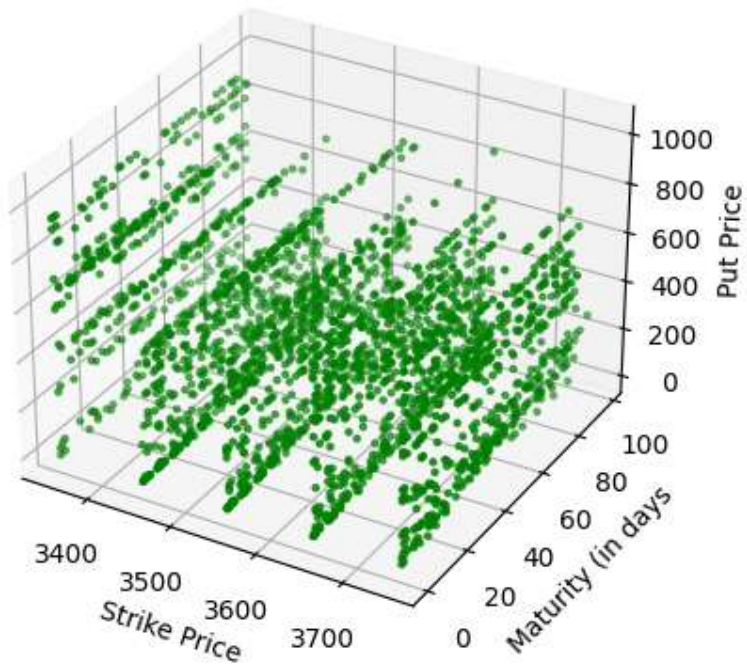
2d plot Put vs Maturity for TECHM.NS

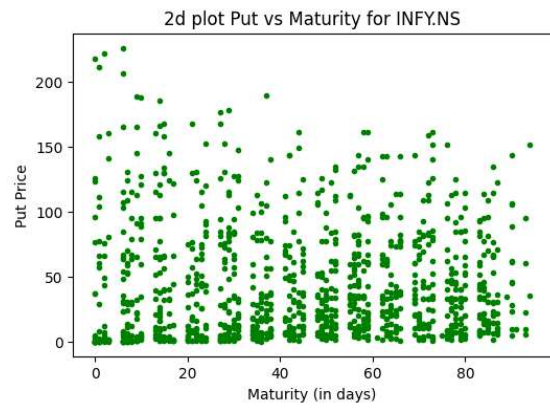
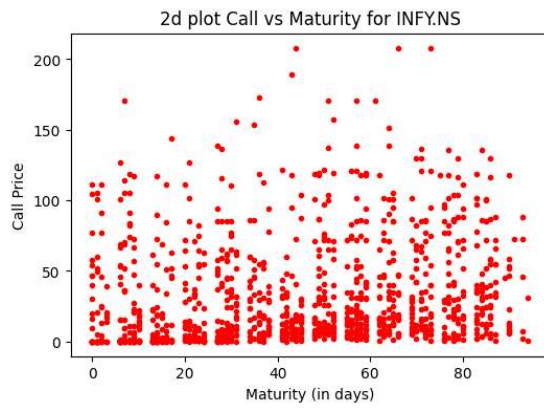
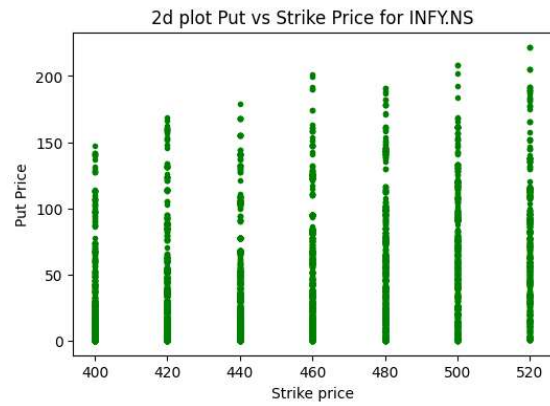
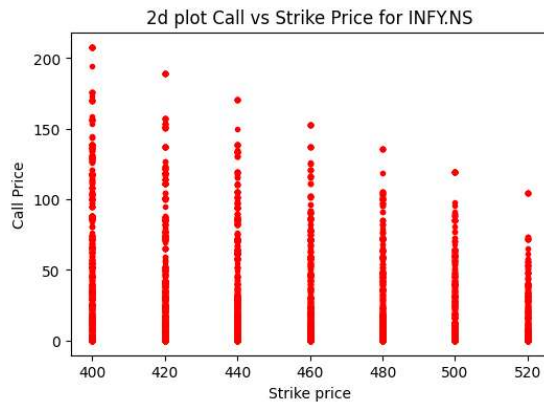


Call Option(3d plot) - TECHM.NS

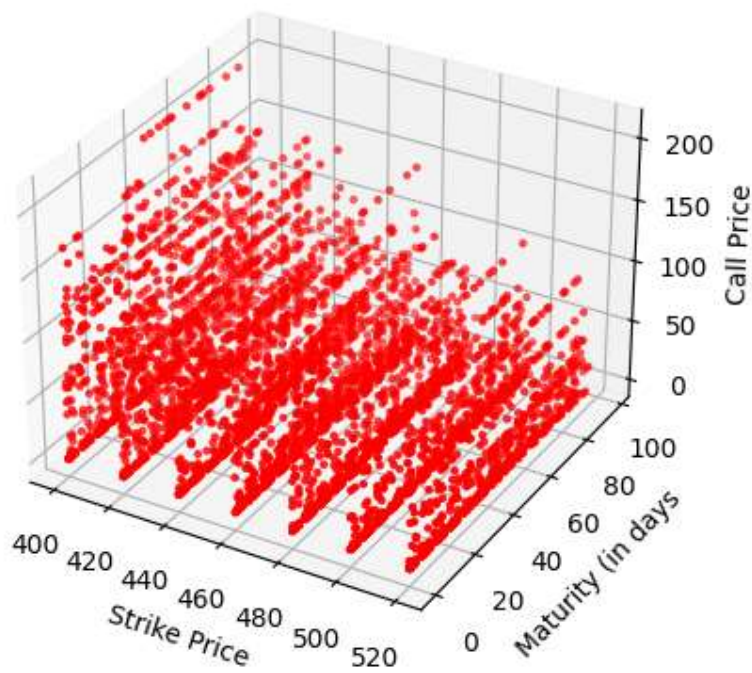


Put Option(3d plot) - TECHM.NS

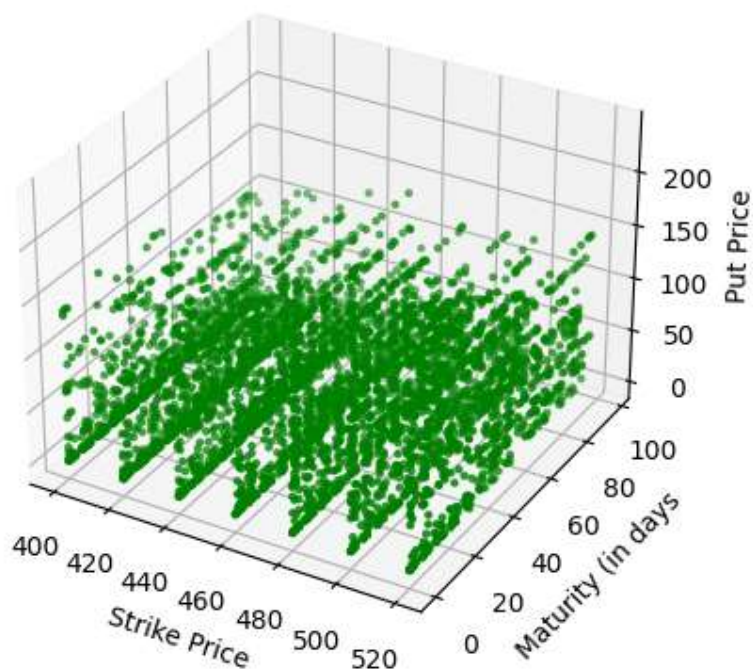




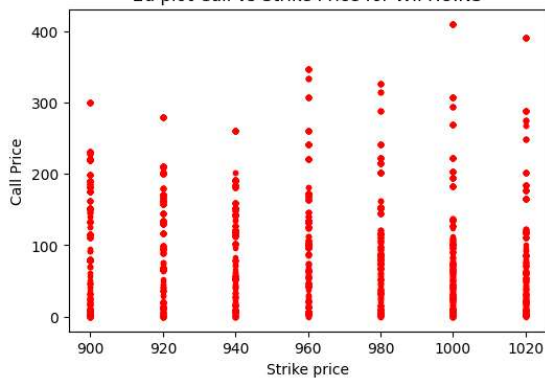
Call Option(3d plot) - INFY.NS



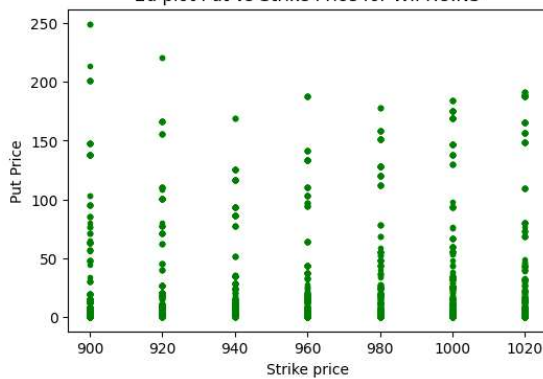
Put Option(3d plot) - INFY.NS



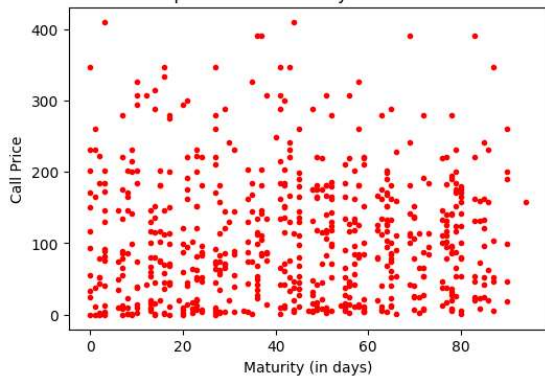
2d plot Call vs Strike Price for WIPRO.NS



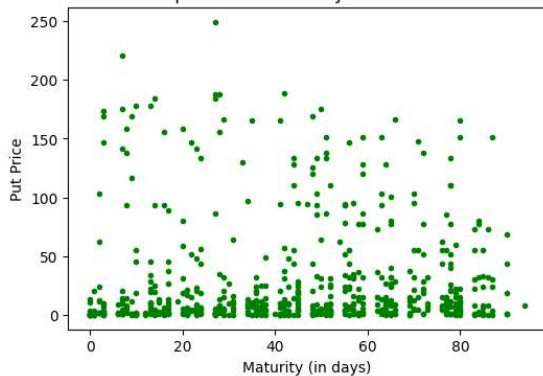
2d plot Put vs Strike Price for WIPRO.NS



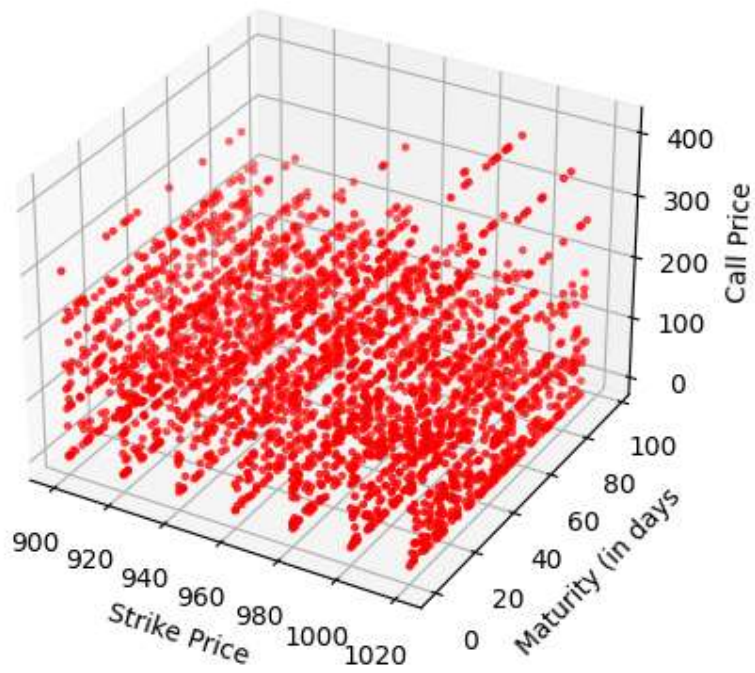
2d plot Call vs Maturity for WIPRO.NS



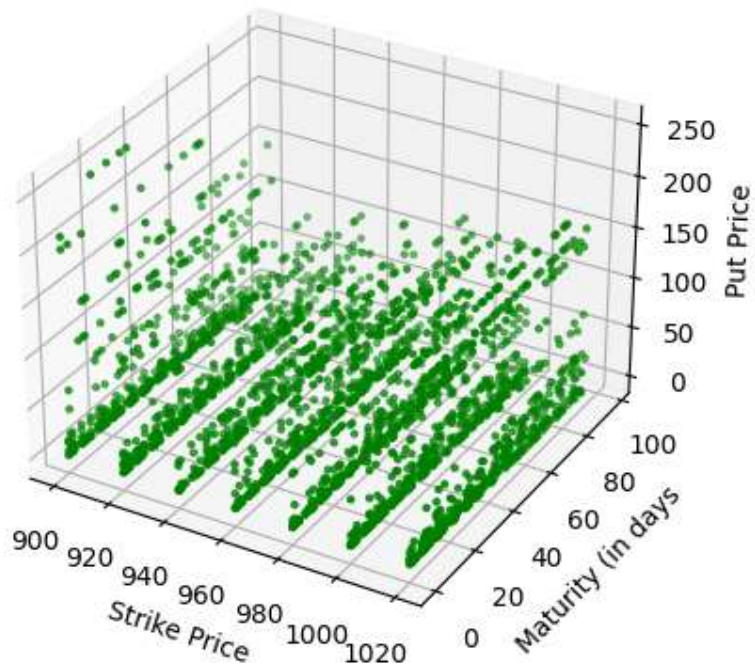
2d plot Put vs Maturity for WIPRO.NS



Call Option(3d plot) - WIPRO.NS



Put Option(3d plot) - WIPRO.NS



3)

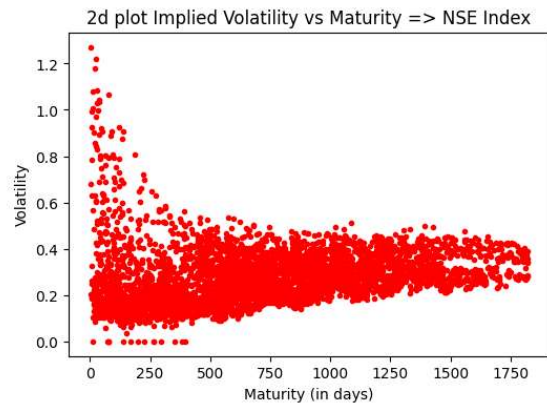
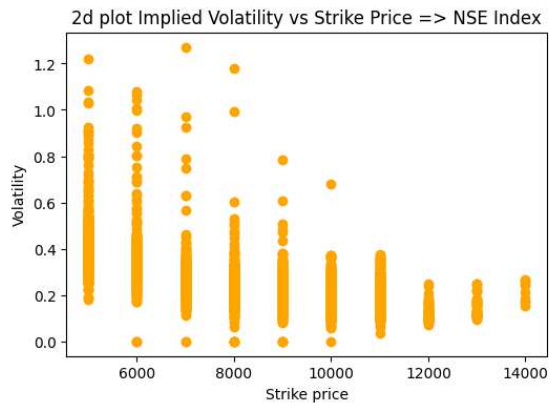
Observations –

1. The lack of sufficient data adds difficulty in making proper analysis, but general trends can be figured out by considering the plots for NIFTY50 since it has larger data-points. The other plots also show similar trends.

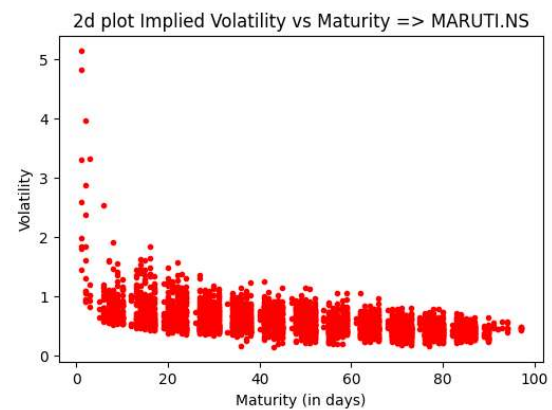
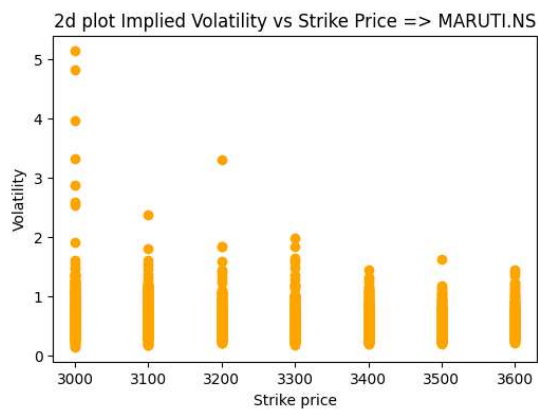
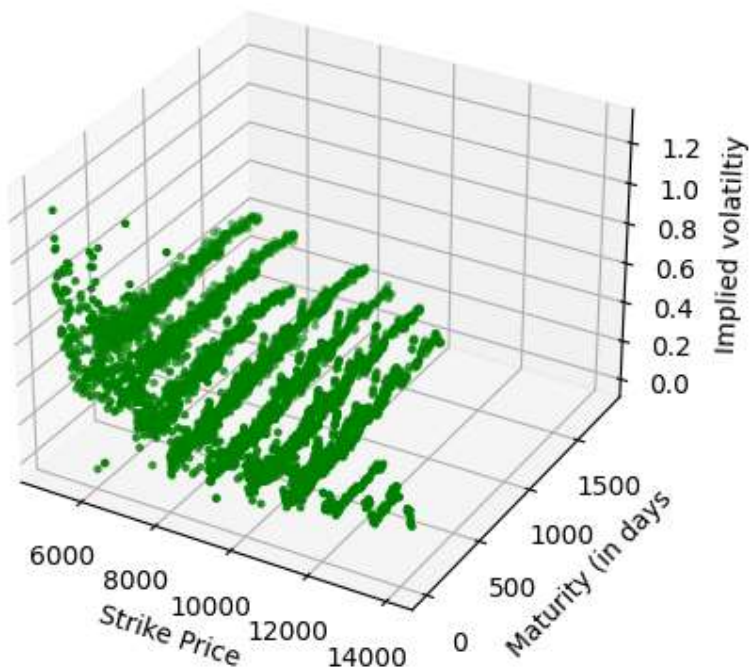
2. Theoretically, the implied volatility is generally a convex function of strike price, and the curve so formed is known as the Volatility Smile. But this feature is not prominently observed in the plotted curves.

3. The volatility generally tends to decrease for larger maturity values, but for some of the above plots this nature is not very much observed.

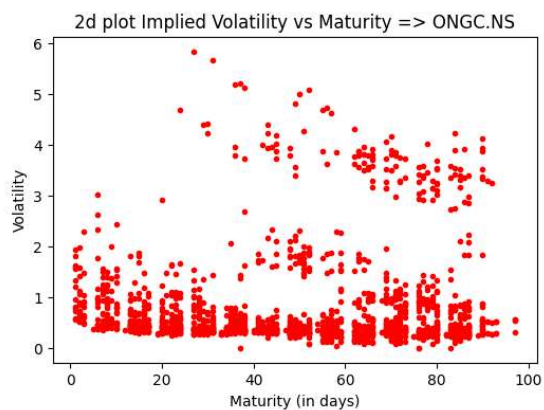
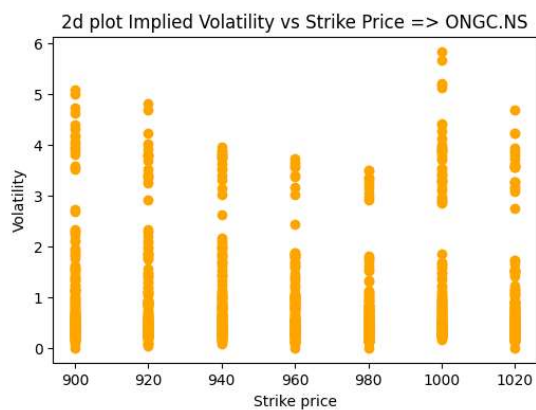
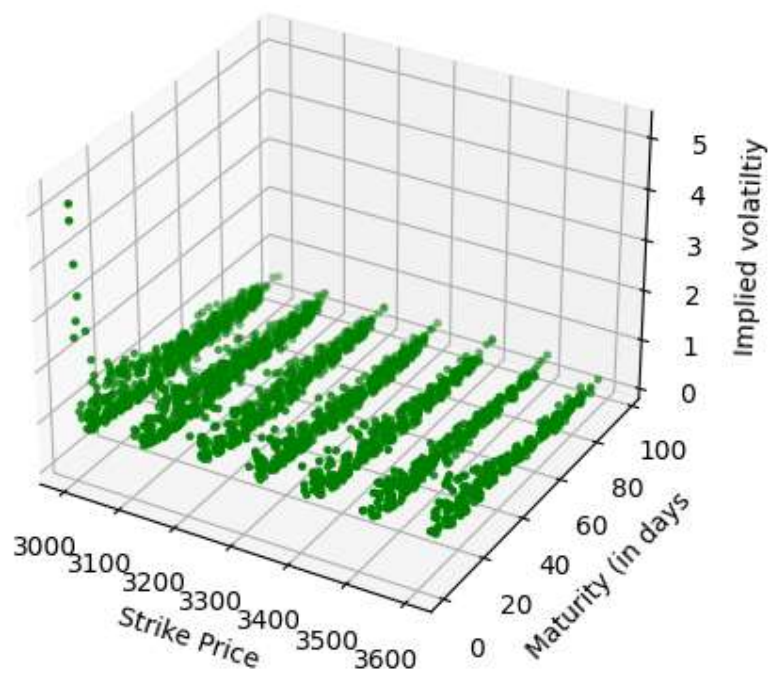
4. Apart from the strike price and maturity period, the implied volatility seems to also depend on when the price was collected. This means that even if the period values are same, the prices may differ if they are collected at different point of time (e.g., collection from 1st Jan 2018 – 31st Dec 2019 will show different price from that of 1st Jan 2019 – 31st Jan 2019 even if all the parameters are kept same). This is due to the fact that the real market has several other random components, which affect the prices. Owing to this reason, the scatter plots are constructed to capture all these factors.



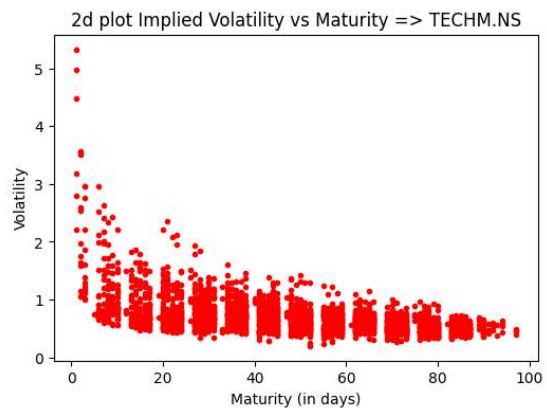
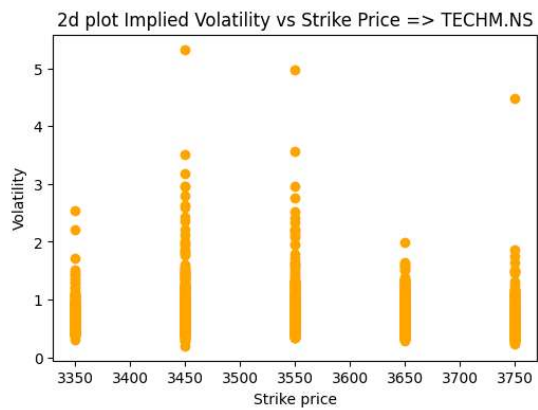
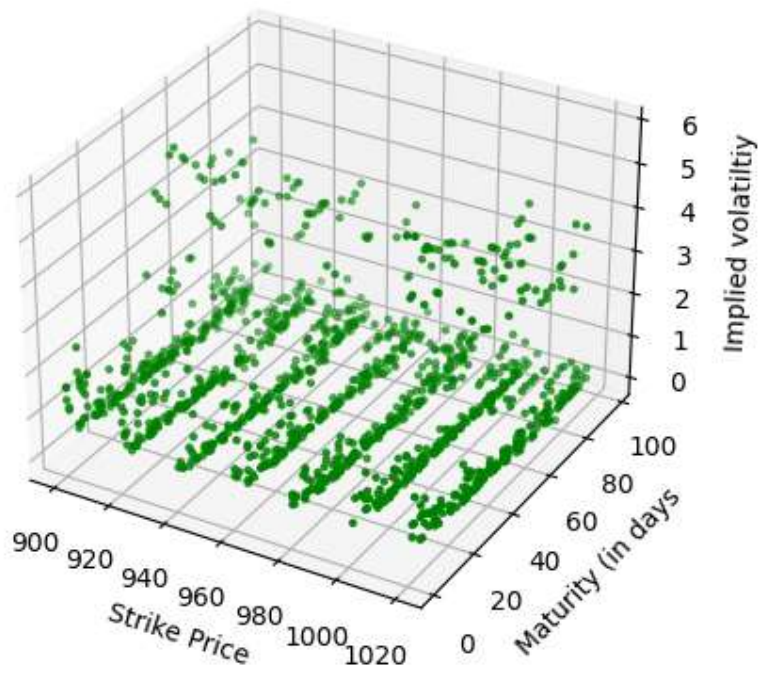
Implied volatility(3d plot) - NSE Index



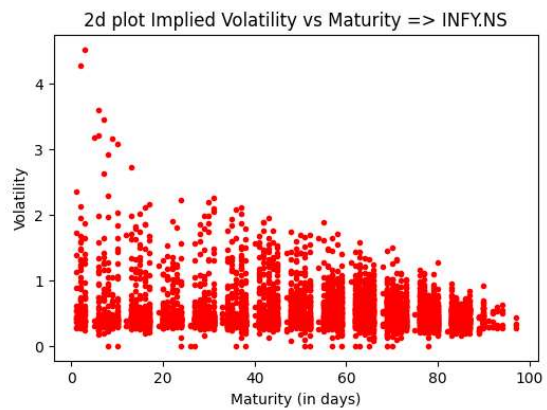
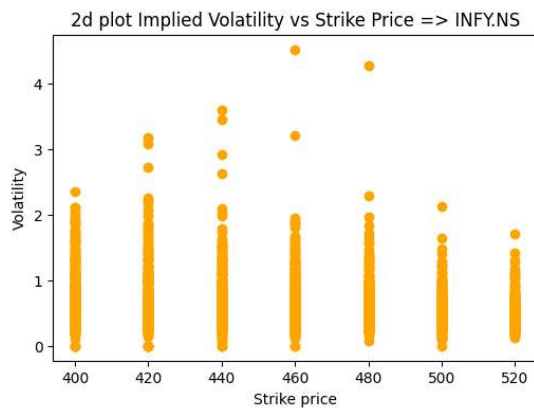
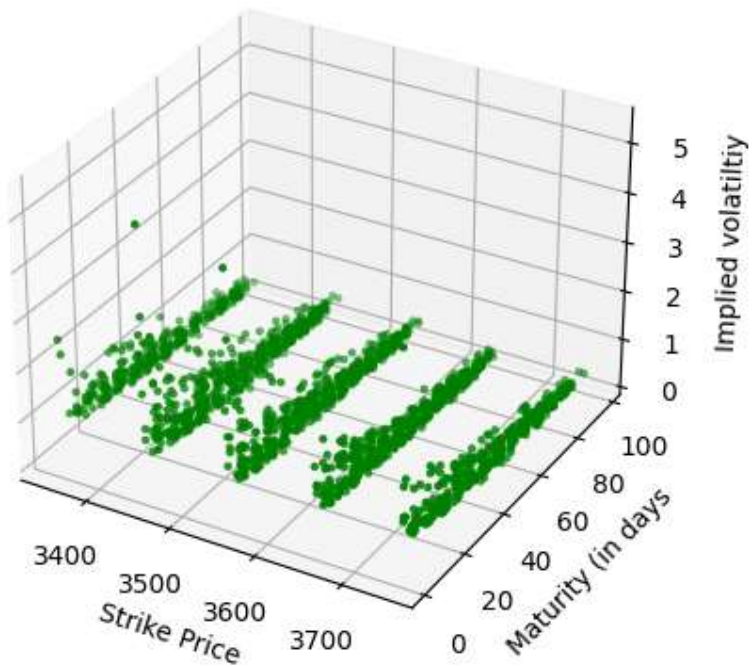
Implied volatility(3d plot) - MARUTI.NS



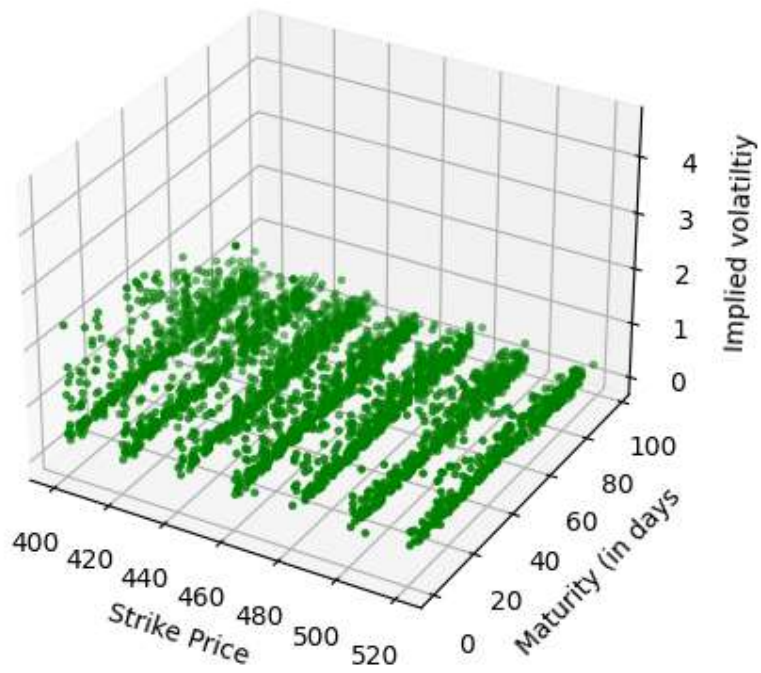
Implied volatility(3d plot) - ONGC.NS



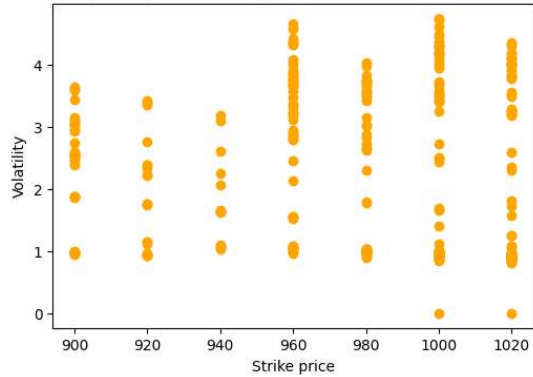
Implied volatility(3d plot) - TECHM.NS



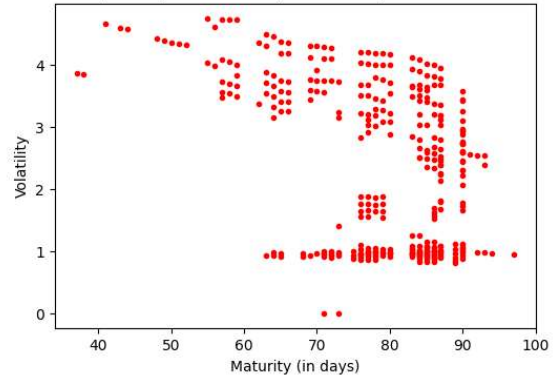
Implied volatility(3d plot) - INFY.NS



2d plot Implied Volatility vs Strike Price => WIPRO.NS



2d plot Implied Volatility vs Maturity => WIPRO.NS



Implied volatility(3d plot) - WIPRO.NS

