

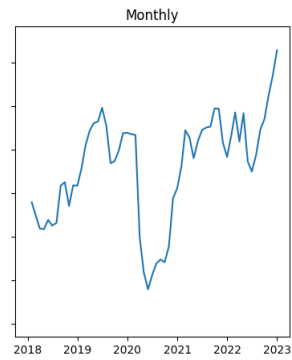
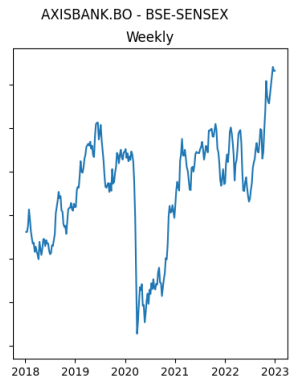
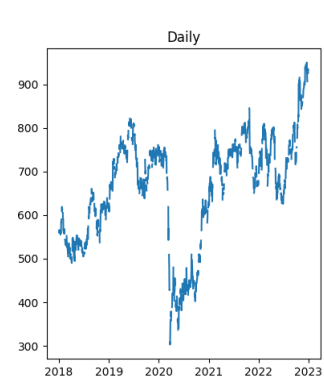
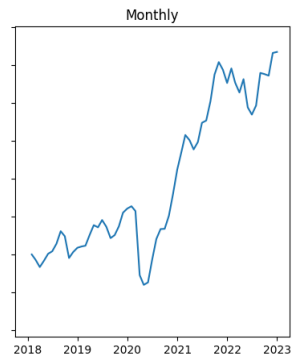
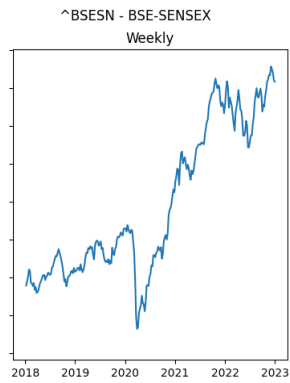
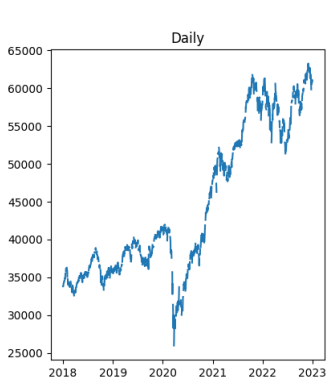
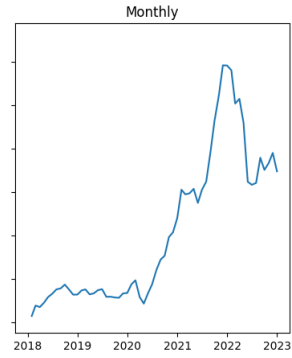
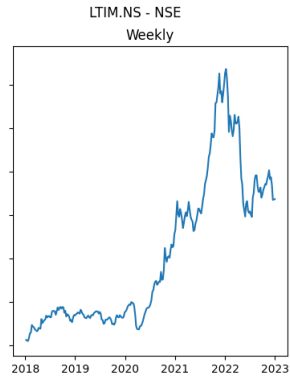
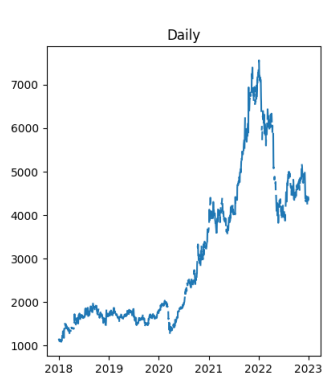
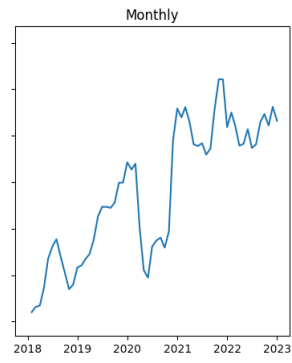
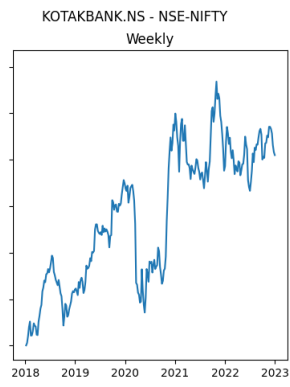
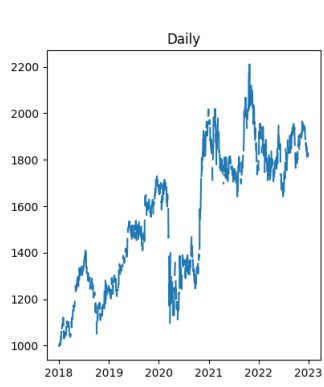
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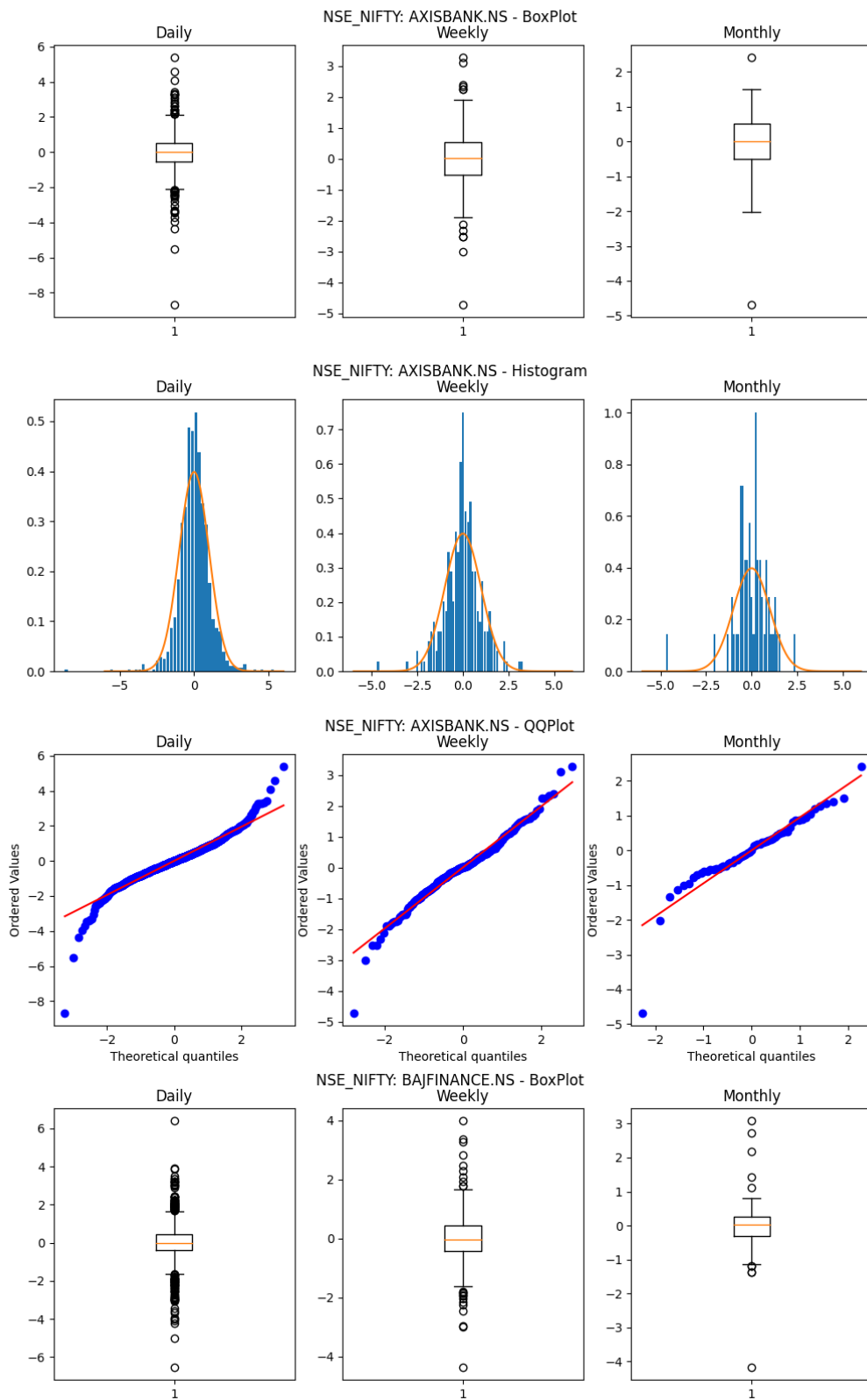
-Aman Kumar (200123007)

Question 1

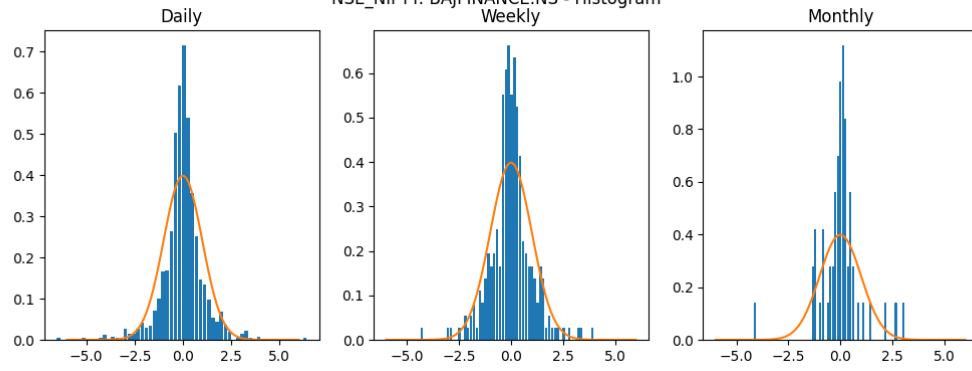




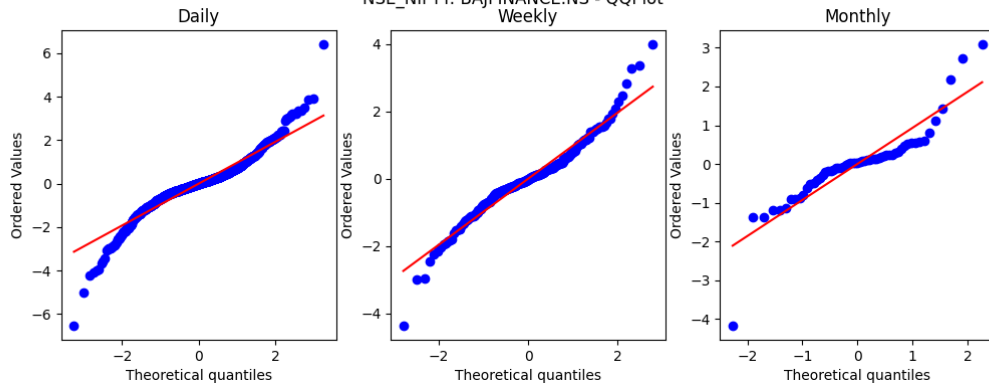
Question 2



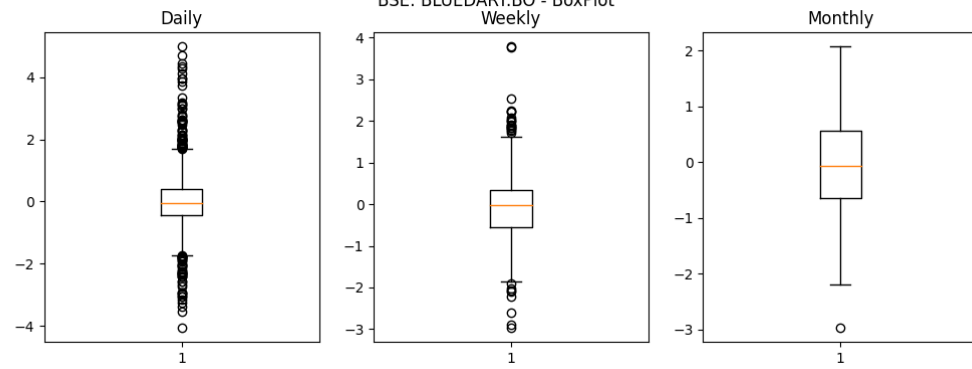
NSE_NIFTY: BAJFINANCE.NS - Histogram



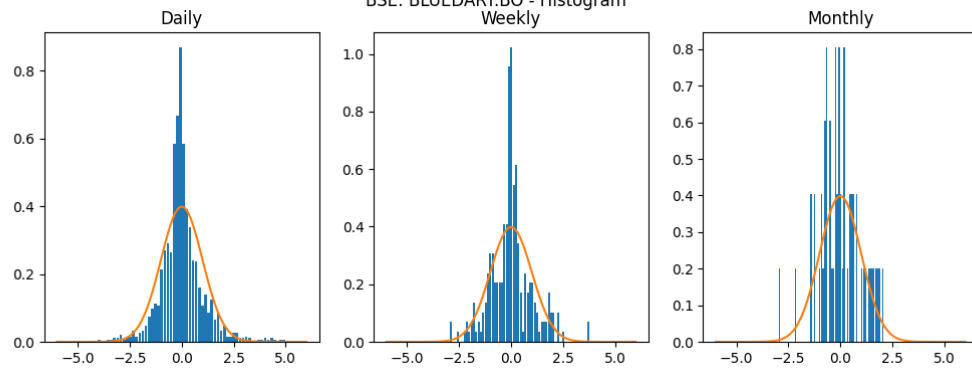
NSE_NIFTY: BAJFINANCE.NS - QQPlot



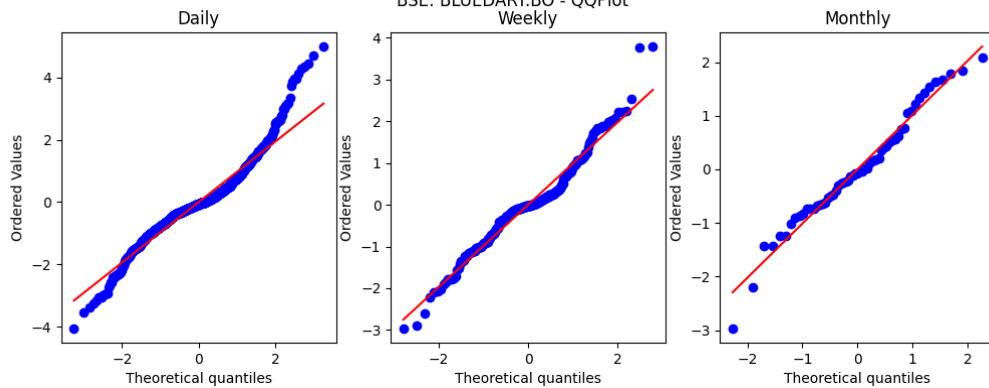
BSE: BLUEDART.BO - BoxPlot



BSE: BLUEDART.BO - Histogram



BSE: BLUEDART.BO - QQPlot



Observation-

1. We can observe that the $N(0, 1)$ roughly estimates the normalized returns, which is more accurate if the returns are computed on daily basis instead of weekly or monthly.

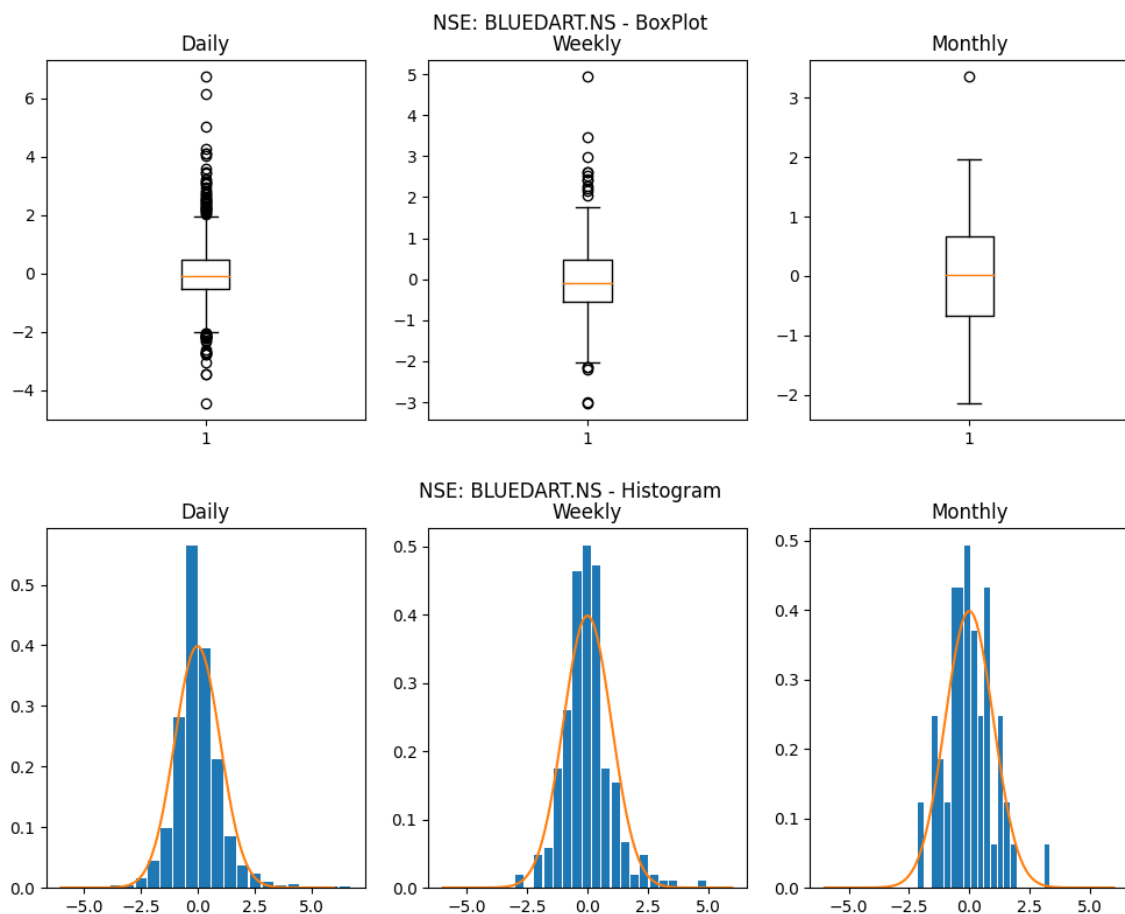
2. The deviations are due to the random fluctuations in the real world market, so, naïve Gaussian distribution can't completely model it.

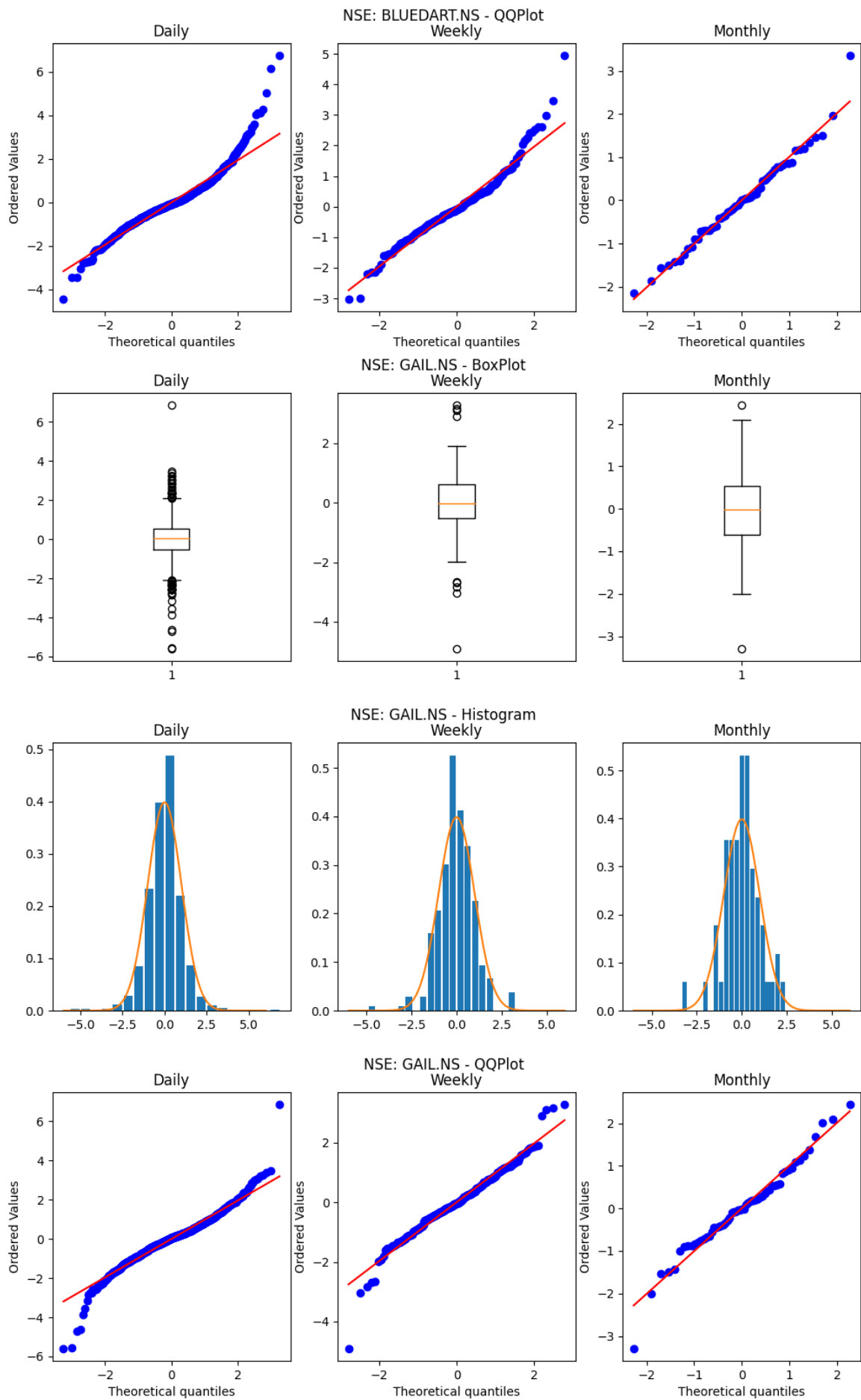
3. It is more evident when a closer look is taken at the tails of these plots. The curve for $N(0, 1)$ steeply decreases to 0, but the returns on the prices does not. At the tails, there seem to be more deviations, and more proper model using a mix of different distributions is required to capture those changes.

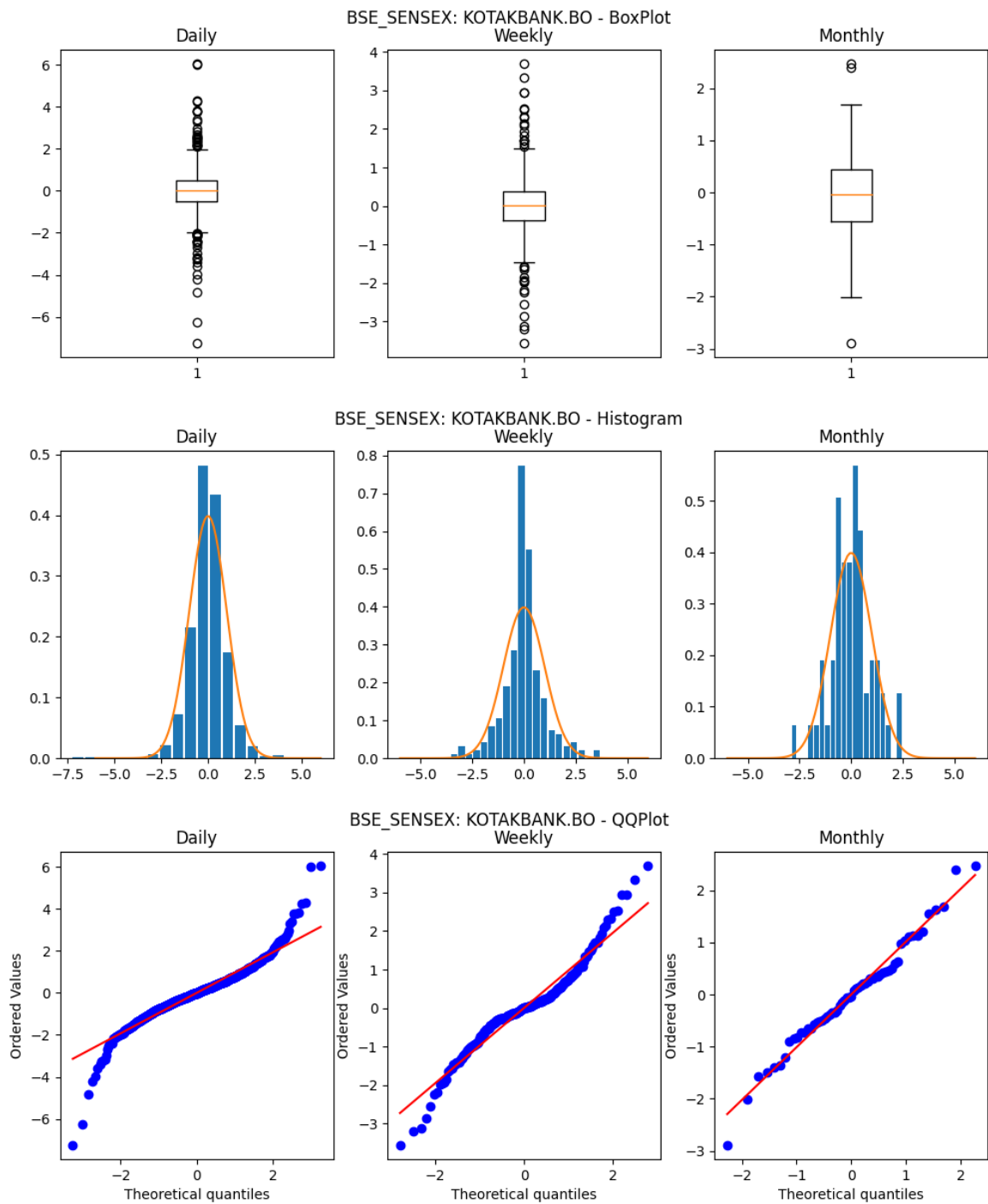
4. Such a behaviour is called as leptokurtic, i.e., high peaks and heavy tails. Jump diffusion model (by Merton) take these so called jumps at the tails into account.

5. The Quantile-Quantile plots have good amount of skewness at the ends which shows deviation from what is expected as compared to normal distribution.

Question 3



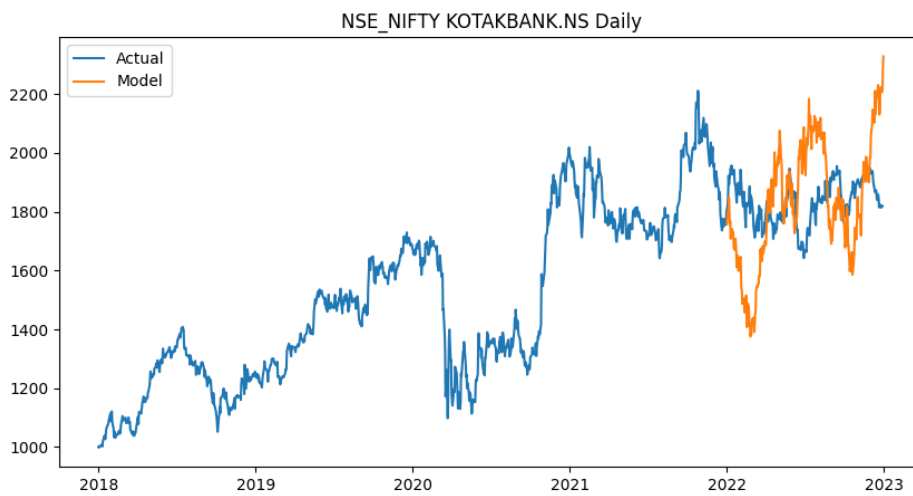
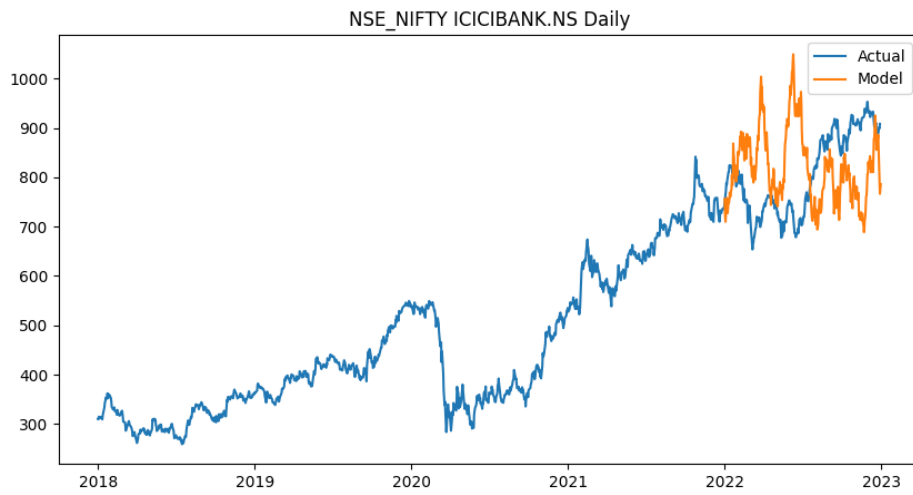
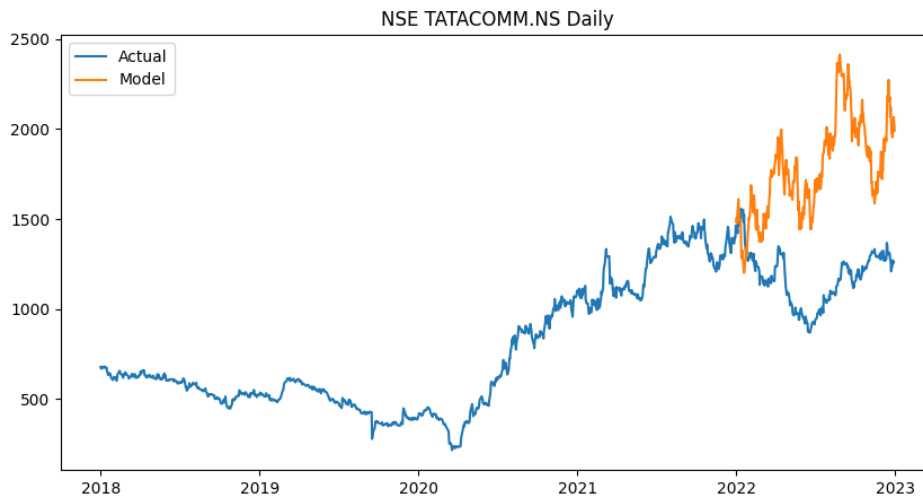


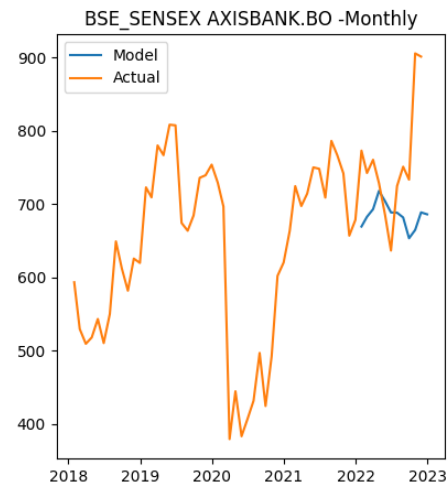
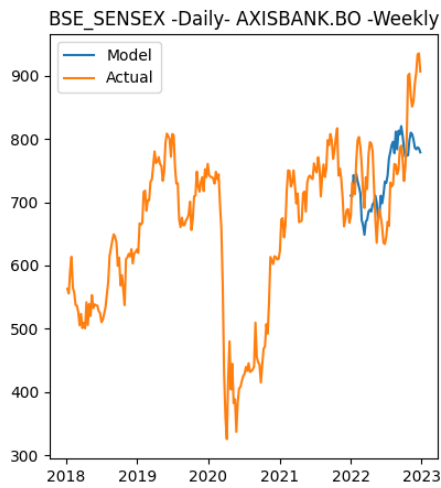
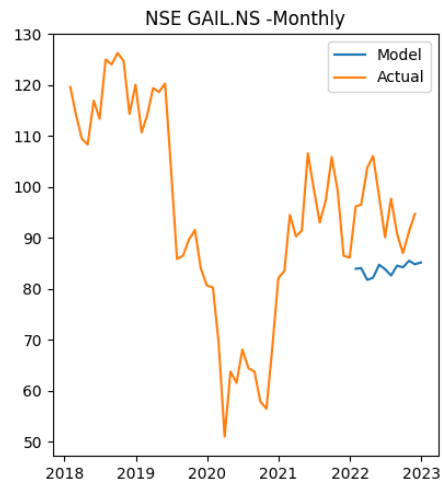
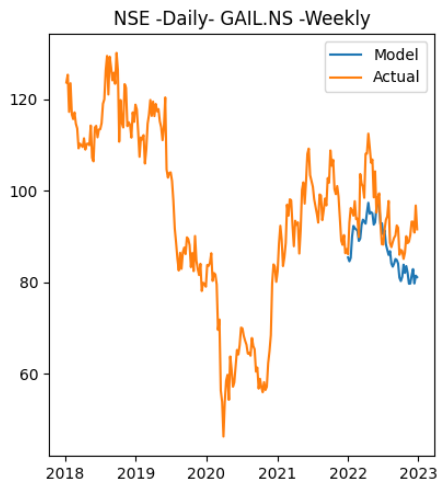
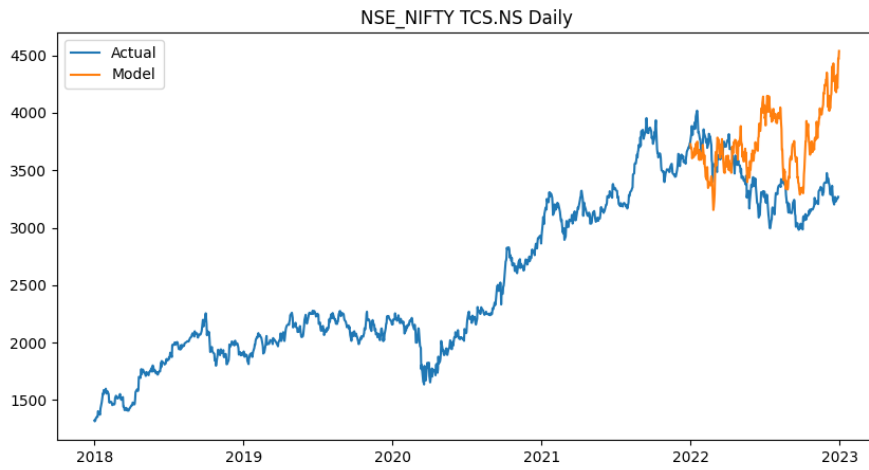


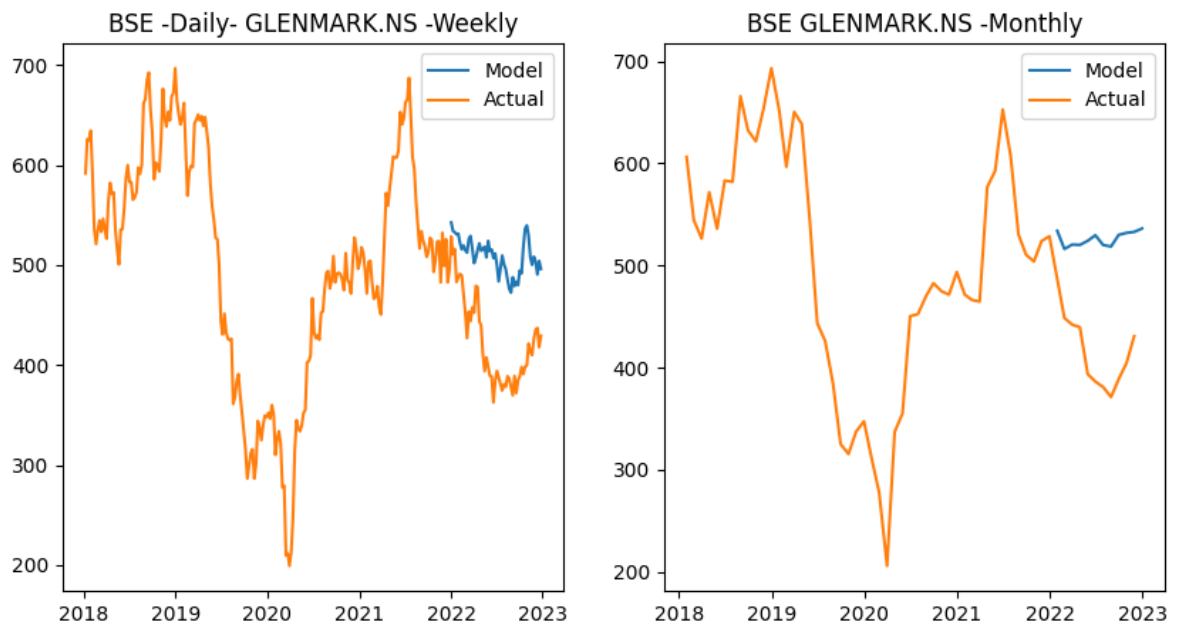
Observation-

The log plots show almost same behavior as compared to the previous plots.

Question 4 & 5







Observation-

1. Using just μ and σ of previous data these predicted price is calculated. It doesn't nearly follow the same trend because it is just a random variable. Without using future data the GBM model will not look alike the actual price.