**Question 5: interpretation of data analysis:**

1. Volatility (Pre-Covid vs. Covid):

Apple and Samsung’s pre-Covid and Covid volatilities are direct measures of how much the daily returns fluctuated over time in those periods.

If the Covid volatility is higher than the pre-Covid volatility, it indicates that the stock became more volatile (i.e., the prices fluctuated more) during the pandemic period. A higher volatility generally means that the stock was subject to larger price swings.

2. Comparing Volatility between Companies:

If Apple’s volatility increased more during the pandemic compared to Samsung, it could imply that Apple’s stock was more sensitive to the market conditions induced by the pandemic.

if Samsung’s volatility increased more, it could indicate greater uncertainty or risks perceived by investors in Samsung compared to Apple during that period.

3. Economic Interpretation:

- Stock price volatility is often driven by uncertainty in the markets. During the pandemic, numerous factors (lockdowns, supply chain disruptions, changes in consumer behavior, etc.) may have contributed to increased volatility.

4. Impact on Investors:

- Higher volatility often indicates higher risk. Investors might avoid such stocks during volatile periods.

- A steady decline in volatility toward pre-Covid levels could signal a return to normalcy, suggesting that the market has absorbed the pandemic's impact and stabilized.

Thus, this analysis helps to highlight the risk or instability of these stocks over time. Apple’s higher volatility indicates it has experienced more price swings, while Samsung’s more stable line suggests less price movement and potentially lower risk.

**Interpretation of Linear Regression:**

1. Slope: 0.0679

Interpretation: For every 1% increase in Apple’s returns, Samsung’s returns are expected to increase by approximately 0.068%. This indicates a positive relationship between the returns of the two stocks, suggesting that when Apple performs well, Samsung tends to perform well too, but the effect is relatively small.

2. R-squared: 0.0066

Interpretation: An R² value suggests that only about 0.66% of the variance in Samsung’s returns can be explained by the variance in Apple’s returns. This is very low, indicating that there is a weak relationship between the returns of the two stocks. In other words, most of the variability in Samsung’s returns is due to factors other than Apple's returns.

3. P-value: 0.0009

Interpretation: A p-value of 0.0009 is quite small and indicates that the slope is statistically significant.

Conclusion:

Overall, while there is a statistically significant positive relationship between Apple and Samsung's returns, the practical impact of Apple's performance on Samsung's returns appears to be minimal. This insight could inform investment strategies, indicating that while the stocks may move together to some extent, they are not strongly correlated.

**Interpretation of Histograms:**

The histograms for both apple and Samsung shows a normal distribution but the spread for both is more during covid period. A wider spread indicates greater volatility in returns, meaning that daily returns fluctuate significantly.

Taller bar indicates that more days had returns within that specific range.