Volatility is a statistical measure of how much a stock's price fluctuates over time. It's often measured using the standard deviation of returns, which is the difference between a stock's individual returns and its average return over a given period.

Volatility is a key factor in determining the risk of an investment. Stocks with higher volatility are generally considered riskier because their prices are less predictable.

The Nasdaq 100 Index is a collection of the 100 largest, most actively traded companies listed on the Nasdaq stock exchange. The index includes companies from diverse industries like manufacturing, technology, healthcare, and others.

**Question 4: interpretation of data analysis:**

Apple experienced the highest growth among the three, significantly outperforming both Samsung and the NASDAQ-100 Tech Index.

Samsung has had the most stable growth, indicating a steadier stock price with fewer large variations.

The NASDAQ-100 Tech Index has grown steadily, reflecting the performance of the overall tech sector, though not as sharply as Apple.

All three stocks show a dramatic increase in volatility around 2020, coinciding with the COVID-19 pandemic. During this time, both tech stocks and markets in general experienced increased uncertainty.

After the pandemic peak, volatility for all three starts to normalize, but Apple and the NASDAQ-100 Tech Index show periodic spikes, especially during 2021-2023. Samsung remains relatively stable, with fewer drastic changes in volatility.

Apple tends to have the most pronounced spikes in volatility, indicating its stock experienced greater fluctuations over time. Samsung remains the most stable, with the lowest volatility, and the NASDAQ-100 Tech Index shows an intermediate pattern.