**Risk and Returns : The Information Ratio**

**Introduction:**

An investment may make sense if we expect it to return more money than it costs. But returns are only part of the story because they are risky - there may be a range of possible outcomes. How does one compare different investments that may deliver similar results on average, but exhibit different levels of risks?

Enter William Sharpe. He introduced the reward-to-variability ratio in 1966 that soon came to be called the Sharpe Ratio. It compares the expected returns for two investment opportunities and calculates the additional return per unit of risk an investor could obtain by choosing one over the other. In particular, it looks at the difference in returns for two investments and compares the average difference to the standard deviation (as a measure of risk) of this difference. A higher Sharpe ratio means that the reward will be higher for a given amount of risk. It is common to compare a specific opportunity against a benchmark that represents an entire category of investments.

**Requirements:**

* Python
* Pandas, Scikit and Numpy Libraries

**Uses:**

* Helps in Investing wisely which results in saving of money.

**Existing System:**

Step 1: The Average Difference in Daily Returns Stocks vs Performance of 500 Largest Stocks

- We need to calculate the average of the excess returns. This tells us how much more or less the investment yields per day compared to the benchmark.

Step 2: Standard Deviation of the Return difference.

- we calculate the standard deviation of the excess returns. This shows us the amount of risk an investment in the stocks implies as compared to an investment in the 500 Largest Stocks.

**Proposed System:**

The Sharpe ratio is an indicator of risk-adjusted returns. However, the Sharpe ratio is calculated as the difference between an asset's return and the risk-free rate of return divided by the standard deviation of the asset's returns. The IR aims to measure the risk-adjusted return in relation to a benchmark, such as the Standard & Poor's 500 Index (S&P 500), and it measures the consistency of an investment's performance. However, the Sharpe ratio measures how much an investment portfolio outperformed the risk-free rate of return on a risk-adjusted basis. So we are using Information ration instead of Sharpe Ratio.