# Stock Market Analysis & Prediction

## Overview

The stock market plays a crucial role in the economy, influencing and reflecting the financial state and growth of businesses and countries. Investors, analysts, and financial institutions continuously seek to understand and predict stock price movements to make informed investment decisions, minimize risks, and maximize returns.

Stock market prediction involves using historical data, statistical techniques, and machine learning models to forecast future prices or trends. However, the market is affected by a multitude of factors including economic indicators, political events, investor sentiment, and company performance, making accurate prediction a challenging task.

The NASDAQ-100 Index is one of the most closely watched stock indices in the world, representing 100 of the largest non-financial companies listed on the NASDAQ stock exchange. It includes industry giants such as Apple, Microsoft, Amazon, and Alphabet, making it a key indicator of the performance of the technology and innovation-driven sectors of the U.S. economy.

This project aims to analyze historical price trends of the NASDAQ-100 and build a predictive model that estimates future index movements. By leveraging historical data and applying modern analytical techniques such as machine learning, we hope to identify patterns that can improve the accuracy of stock market forecasts. We will also look at correlation between different stocks in the NASDAQ-100

Understanding stock price trends and being able to predict them, even in the short term, can provide significant advantages for traders and investors. It also contributes to the broader field of financial analytics and helps bridge the gap between traditional financial theory and modern data science techniques.

## Dataset Overview

For this project, we are using historical stock market data obtained from Yahoo Finance and it’s yfinance API for Python. The dataset includes daily stock prices for NASDAQ-100 companies. The key features in the dataset include:

* Financial data such as dividends, splits, earnings, actions, financials, balance sheets / cash flow, price, volume, market cap, etc.
* Forecast data such as analyst price targets, growth estimates, revenue estimates, etc.
* Ownership and Insider data such as insider purchases / transactions, institutional and major holders, etc.
* News and filing data such as recent news headlines about the company and SEC filings.

There are also callable functions / methods to fetch or update data about stocks.

## Data Pre-Processing