

# Stock Indexes vs Macroeconomic Indicators

---

By: Maura Ellsworth, Armine Arutyunyan, Birundha Varatharajan & Ramazan Khaev

# Summary

For our final project, we decided to take a look at 3 different stock indexes, The Dow Jones, Nasdaq and the S&P. Our goal was to determine how these indexes stand up against various macroeconomic factors (CPI, Unemployment, FedRate (interest rates) and Inflation). We used these factors to then build a Machine Learning Model to determine how the Indexes will perform in the future

# Data Collection

We have found multiple excel sheets via Kaggle to be used and cleaned for our project.

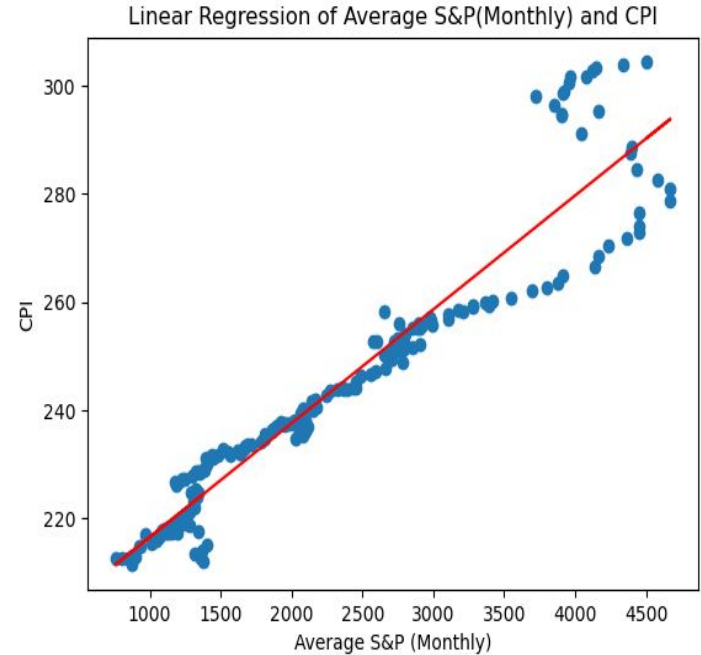
- Daily open, close high and low for Dow Jones, Nasdaq and S&P from 1/2/2008 to present (we then took the averages of the open and close)
- Daily Inflation & Fed Funds
- Monthly CPI and Unemployment rate

# Tools Used

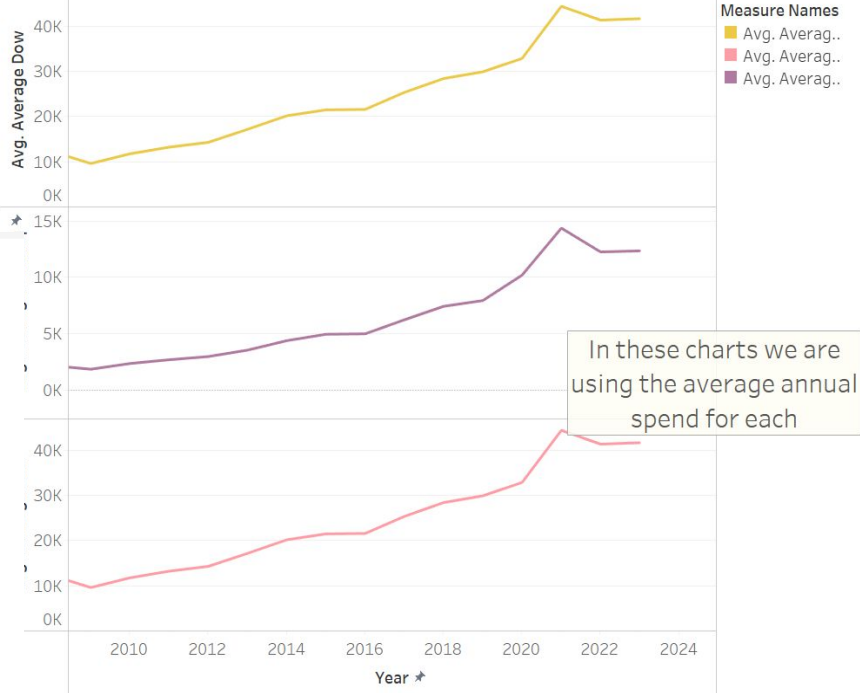
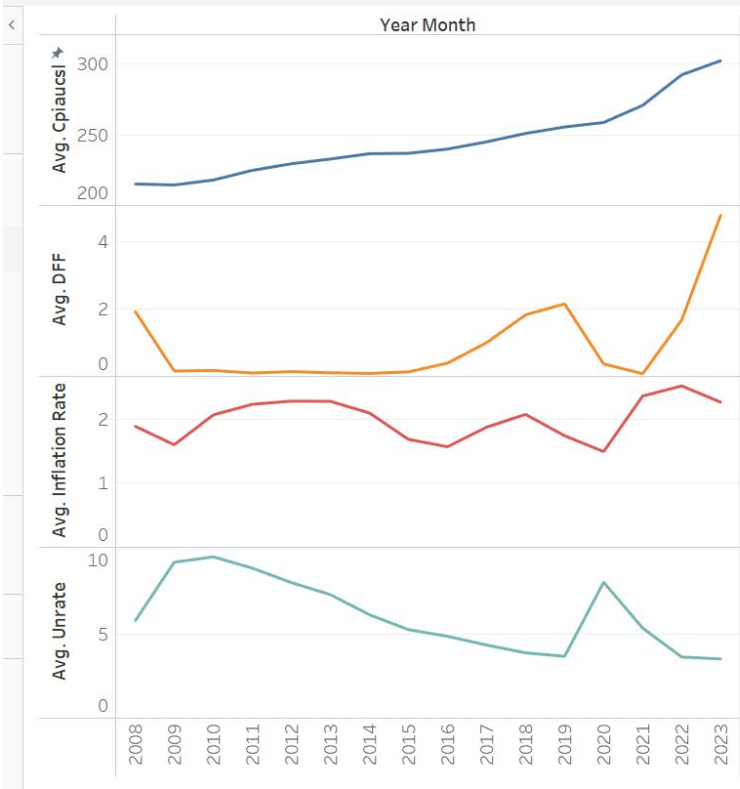
- Python Pandas
- Python Matplotlib
- Machine Learning- Random Forest Regressor
- Tableau

# Initial Analysis

- Once the data was cleaned, we then did regression lines of the 3 indexes and the macroeconomic factors to see what the highest correlation was
- The highest correlation was between the indexes and CPI (S&P VS CPI at 0.95)
- The lowest correlation was Inflation rate and the indexes (S&P was at 0.23)



# Tableau Analysis

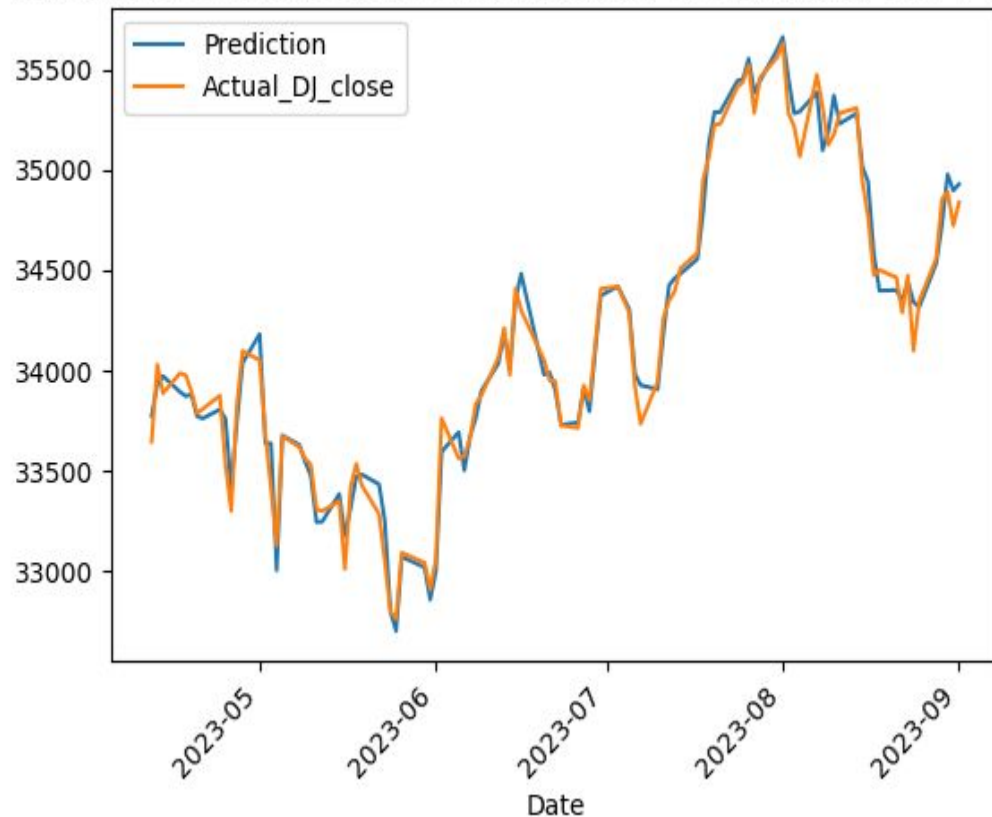


[Tableau 1](#)  
[Tableau 2](#)

# Machine Learning

- A Machine Learning model was created using Random Forest Regressor to predict the closing stock price for the Dow Jones using stock history.
- The model is 98% accurate in predicting the close

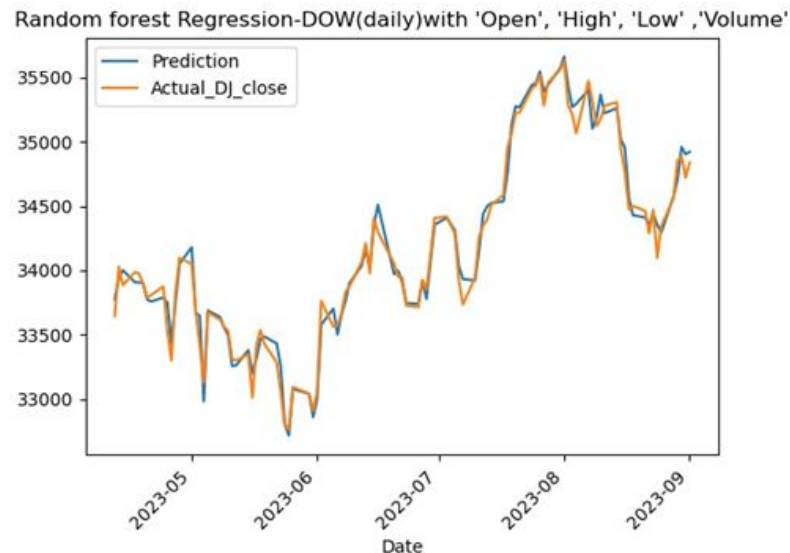
Random forest Regression-DOW(daily)with 'Open', 'High', 'Low', 'Volume'



# Machine Learning

- Expected key U.S. macroeconomic indicators like unemployment, inflation and CPI and FDD were going to be among the highly ranked features.
- While the stock market is influenced by a many factors, the CPI can significantly influence swings in performance. For instance, reactionary Fed moves can directly impact corporate profits and economic growth, leading the stock value to fluctuate drastically. Higher Fed rate hikes based on CPI often cause the market to dip or slow as traders want to hedge their bets.

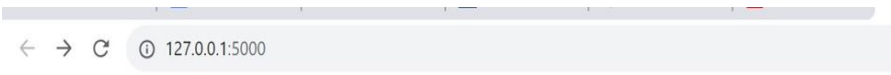
Another regressor model will predict the impact of DJ's stock price based on Macro economic indicators (CPI,FDD, Inflation Rate, unemployment rate)





# Flask App

A basic flask APP is created to predict DJ stock price, which will ask for the stock ticker name(^DJI) and the year .The app will run in local host <http://127.0.0.1:5000/>.

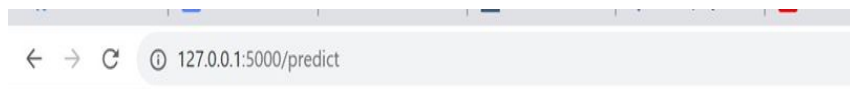


## Stock prediction

Enter a Stock Ticker Symbol to See the prediction

Stock Ticker Symbol:

Year



## Stock Price:

This is the predicted stock price [34922.4015625]%).