



# Predicting NIFTY 50 Returns Using Top 10 Stocks

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# Objective

Building a model to predict NIFTY 50 returns based on the returns of 10 selected stocks from NIFTY 50.



# Stock Selection

**Stock selection:** Chose the top 10 stocks based on market capitalization, representing various sectors in the market.

**Stocks:** Reliance Industries, Tata Consultancy Services, HDFC Bank, Hindustan Unilever, Infosys, Kotak Mahindra Bank, Bajaj Finserv, ICICI Bank, Larsen & Toubro, and State Bank of India.



# Data Collection and Preprocessing

- Data source: Yahoo Finance
- Date range: Last 3 years
- Data fetched for NIFTY 50 and 10 selected stocks (daily adjusted closing prices)
- Calculated daily returns
- Handled missing values and split the data into train and test sets (80% train, 20% test)





# Data Transformation & Model Building

- Standardized the data
- Applied PCA to reduce dimensionality, selected 4 principal components
- Trained an Ordinary Least Squares (OLS) regression model using principal component scores

# Model Evaluation

## Metrics

Metric	Train Data	Test Data
Mean Squared Error (MSE)	5.725e-06	5.330e-06
Root Mean Squared Error (RMSE)	0.00239	0.00231
R-squared	0.951	0.949
Mean Absolute Error (MAE)	0.00180	0.00172
Mean Absolute Percentage Error (MAPE)	138.88%	89.22%
Directional Accuracy*	94.13%	91.95%

\*measures the percentage of correctly predicted return directions (positive/negative)

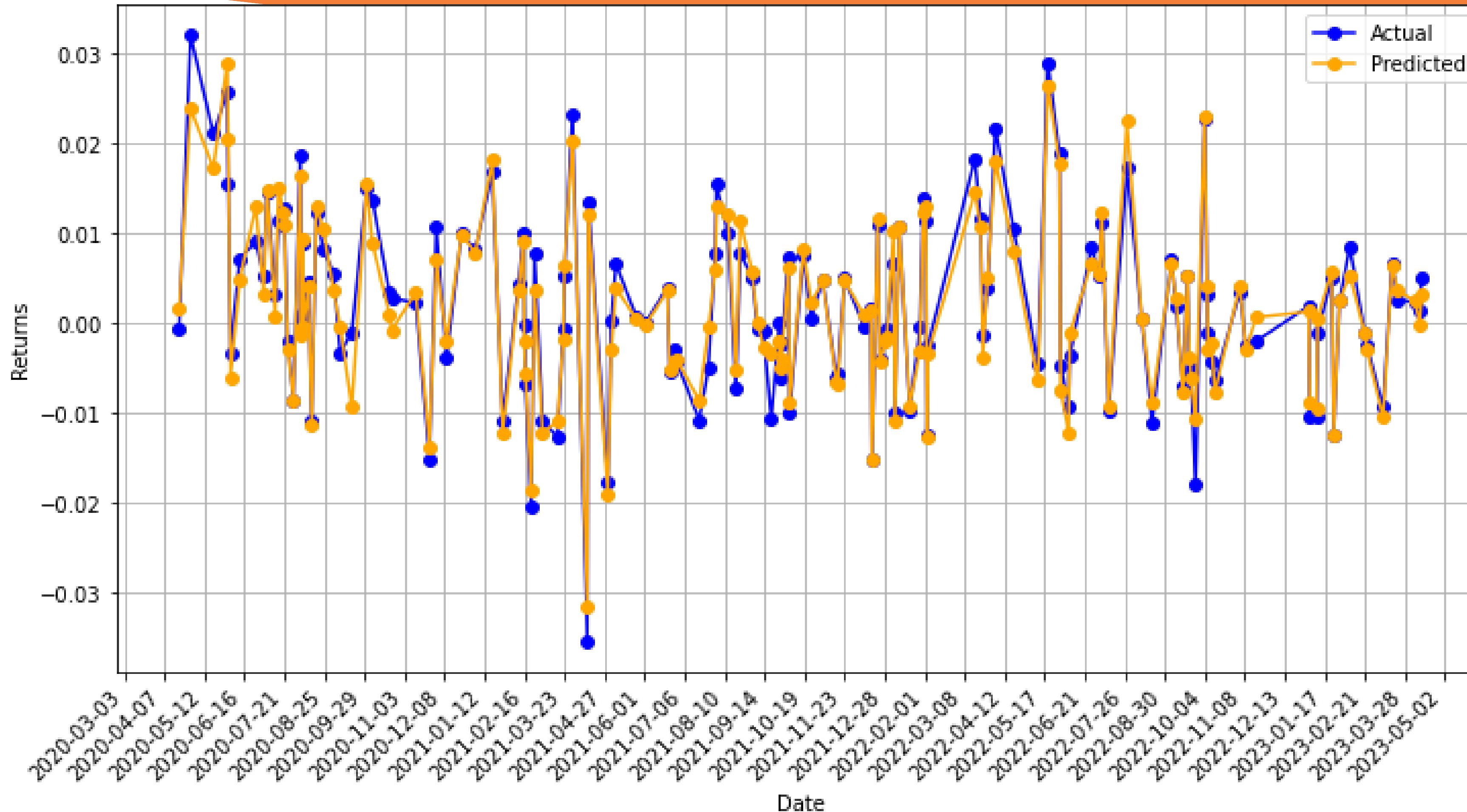


# Insights & Thoughts

- The model demonstrates a strong ability to predict NIFTY 50 returns based on the 10 selected stocks.
- **High R-squared values** indicate that the model explains a large portion of the variance in the returns.
- **Directional accuracy** suggests that the model is quite effective in predicting the direction of returns.
- However, **the MAPE values are relatively high**, indicating that the model may not be as accurate in predicting the magnitude of returns.



## Actual vs. Predicted Nifty50 Returns



# Conclusion and Future Work



- The model provides a strong foundation for predicting NIFTY 50 returns based on the selected stocks.
- Future work can focus on improving the prediction of return magnitudes and exploring alternative modeling techniques.
- Additional factors, such as macroeconomic indicators and sentiment analysis, can be incorporated to enhance the model's performance.

# Thank you!

