

# NIFTY 50 Stock Price Prediction & Pairs Trading Classification

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## Project Proposal

### 1 Problem

The primary objective of this project is to develop a robust machine learning model that accurately analyzes stock prices of individual companies listed in the NIFTY 50 index. Alternatively, the project explores the concept of pairs trading, predicting the relative positions of two stocks within the NIFTY 50. The proposed model aims to offer valuable insights to investors and traders, empowering them to make well-informed decisions.

### 2 Method & Metrics

For a single stock listed in the NIFTY 50 index, the model will predict the stock's trend within a specific timeframe. In the case of pairs trading, the model will predict which stock pairs can be considered as valid trading pairs. The model's methodology incorporates concepts such as Regression, K Nearest Neighbours, K Means Clustering, Decision Trees and Convolutional Neural Networks. Each of these methods provides a unique approach to address the problem. To compare between different methods used, we will use metrics like Mean Squared Error, Confusion Matrices and Sharpe Ratio and Stock Returns. Use of different modules and libraries of Sci-Kit Learn and Pytorch will be implemented in this project.

### 3 Datasets

- Yahoo Finance Python API
- <https://www.kaggle.com/datasets/sudalairajkumar/nifty-indices-dataset>
- <https://www.kaggle.com/datasets/rohanrao/nifty50-stock-market-data/data>