# CNNPred for Indian Stock Index

For this task of using CNNpred to predict Indian Stock Index, NIFTY50 Index was chosen. Open, High, Low, Close, Adjusted Close and Volume Data for the period between 2007-9-18 and 2022-7-27 was collected from NSE website.

Apart from 6 original features, 6 others were engineered based on popular technical indicators, namely ‘3 Days Moving Average’, ‘5 Days Moving Average’, ‘15 Days Moving Average’, ‘30 Days Moving Average’, Daily Trading Volume Difference and Weekly Difference in Closing Values.

Following hyperparameters were varied to find the optimal model-

1. Loss Function (mae, binary\_focal\_crossentropy, binary\_crossentropy, hinge)
2. Optimizer (SGD, Adam, Adagrad, Adamax),
3. Epochs (20, 30),
4. Batch Size (64, 32),
5. Dropout Rate (0.05, 0.1, 0.15, 0.2),

Usually Adam (Adaptive Moment Estimation) Optimizer is faster and outperforms others. So, SGD, Adagrad, Adam, Adamax was chosen. Previous experimentation on Batch Size was done and revealed optimal batch size around 64, thus two batch sizes of 64 and 32 was chosen for further exploration.

The Grid-SearchCV takes more than 4h 30m of training time. At the time of writing this document Google-colab GPU limit was exhausted for training 20 out of 64 models.

References:

<https://www1.nseindia.com/products/content/equities/indices/historical_index_data.htm>

Github Link to Notebook:

<https://github.com/mandalnilabja/soc2022/blob/main/Week10Assignment.ipynb>