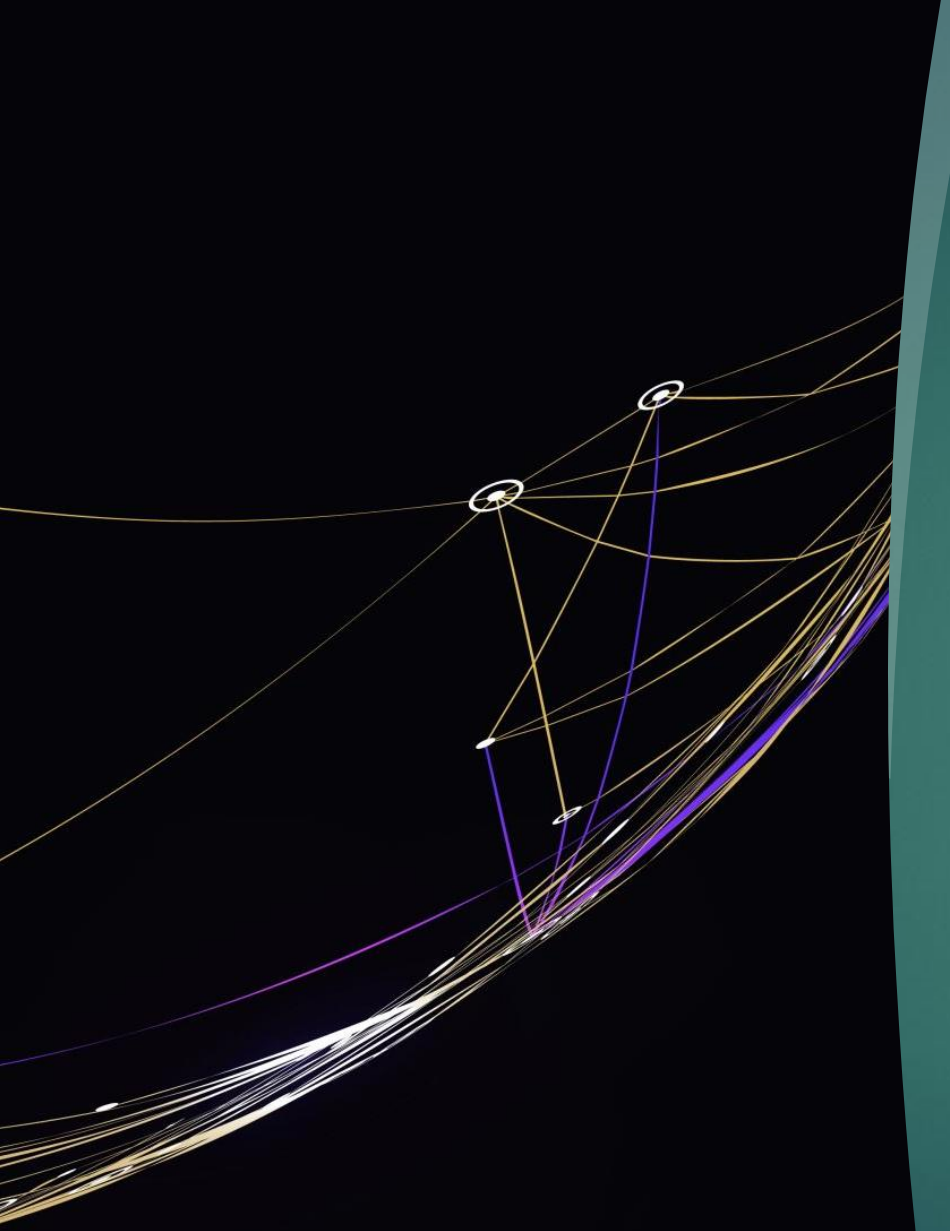

Machine Learning Project Proposal

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Stock Market Trend Prediction using Supervised Learning

ASAD MASOOD KHATTAK, HABIB ULLAH, HASSAN ALI KHALID, AMMARA HABIB, MUHAMMAD ZUBAIR ASGHAR, AND FAZAL MASUD KUNDI

2019

PROCEEDINGS OF THE 10TH INTERNATIONAL SYMPOSIUM ON INFORMATION AND COMMUNICATION TECHNOLOGY

Problem

- Can Supervised Machine Learning practices be applied to accurately predict the stock market?
  - The Stock Market can be volatile
  - Which features (input data) are essential to improving accuracy
  - Which model (algorithm and parameters) provide the best results?
- Without a high-level understanding of the Stock Market, can I produce an accurate model?
  - Do you need to be an expert in a field in order to apply machine learning?

Data

- I used https://www.ksestocks.com/QuotationsData that gathers daily data from the Pakistan Stock Exchange
- Features:
  - Symbol – ticker symbol
  - Date
  - Open Price
  - Daily High
  - Daily Low
  - Close Price
  - Volume Traded
- Currently, I have the daily KSE – 100 index and Nestle Pakistan Limited data going back to October 1st, 2022

Motivation

- Machine Learning is a powerful tool, and I would like to see if I can apply it to something as complicated as the Stock Market
- The Stock Market is vital to the entire world and being able to accurately predict it would be beneficial
- Learn how to apply methodologies learned in this course

Primary Paper

- Stock Market Trend Prediction using Supervised Learning
  - Asad Masood Khattak, Habib Ullah, Hassan Ali Khalid, Ammara Habib, Muhammad Zubair Asghar, and Fazal Masud Kundi
  - 2019
  - Proceedings of the 10th International Symposium on Information and Communication Technology

- This paper applies the K-nearest neighbor to predict a stocks trend using simple to understand features
  - Clear process from data collection through creating model
  - Evaluation of the model

Supporting Paper #1

- Application of Machine Learning in Stock Selection
  - Pengfei Li, Jungang Xu and, Mohammad Al-Hamami
  - 2022
  - Applied Mathematics and Nonlinear Sciences, vol.0, no.0,
- Provides explanation of how different models perform in predicting good stocks to invest in
  - Provides detailed description of which features are important in this process
  - Comparison of the models

Supporting Paper #2

- A comparative study of supervised machine learning algorithms for stock market trend prediction
  - Indu Kumar, Kiran Dogra, Chetna Utreja, and Premlata Yadav
  - 2018
  - 2018 Second International Conference on Inventive Communication and Computational Technologies
- More complicated features
- Detailed comparisons on the models
- Importance of datasets

Summary of the Method

- 1. Data Collection
- 2. Data Normalization
- 3. Apply K-Nearest Neighbors
- 4. Understand Results
- 5. Experiment

- This paper uses easy to understand features, normalizes its data, trains a model and evaluates the performance
  - Reproducing this acts a good starting point in seeing how Machine Learning can be applied and if it is even possible without me having knowledge on stock markets / investing

Planned Method For This Project

- Step 0 (Done):
  - Gather Data
- Step 1:
  - Reproduce results of the primary paper (Method Steps 1 – 3)
- Step 2:
  - Understand results of KNN model
  - Evaluate Data (Supporting Papers)
- Step 3:
  - Create additional models
    - SVM, Random Forest, …
- Step 4:
  - Compare Models

Timeline

- April 10th – 16th
  - Step 1- Reproduce Primary Paper Model
- April 17th – 20th
  - Step 2 – Understand and Evaluating
- April 21st – May 2nd
  - Step 3 – Additional Models
- May 3rd – Due Date
  - Step 4 - Comparisons
  - Project write up and presentation

Expectation

- Firstly, I hope learn how to gather datasets and create ML models without the guidance of a lab
- Learn how to evaluate model results and predictions
- Discover trends and understand how models can use data to predict volatile datasets such as the stock market

Citations

- A. Khattak, H. Ullah, H. Khalid, A. Habib, M. Asghar, and F. Kundi. 2019. Stock Market Trend Prediction using Supervised Learning. In Proceedings of the 10th International Symposium on Information and Communication Technology (SoICT '19). Association for Computing Machinery, New York, NY, USA, 85–91. https://doi.org/10.1145/3368926.3369680
- P. Li, J. Xu and M. AI-Hamami. "Application of machine learning in stock selection" Applied Mathematics and Nonlinear Sciences, vol.0, no.0, 2022, pp.-. https://doi.org/10.2478/amns.2022.1.00025
- I. Kumar, K. Dogra, C. Utreja and P. Yadav, "A Comparative Study of Supervised Machine Learning Algorithms for Stock Market Trend Prediction," 2018 Second International Conference on Inventive Communication and Computational Technologies (ICICCT), Coimbatore, India, 2018, pp. 1003-1007, doi: 10.1109/ICICCT.2018.8473214