

# AI Lab Project

## Project Report: Stock Price Prediction

### 1. Introduction

The goal of this project is to develop predictive models for stock price using historical data. Various regression models, including Linear Regression, Polynomial Regression, RandomForest Regression, K-Nearest Neighbors (KNN), Support Vector Regression (SVR), and a Neural Network, were implemented and evaluated.

### 2. Dataset

The dataset used in this project is the "Stock Exchange KSE 100 (Pakistan)" dataset. The dataset comprises multiple numeric columns such as Open, High, Low and Close.

### 3. Models

- Linear Regression
- Polynomial Regression
- RandomForest Regression.
- K-Nearest Neighbors (KNN)
- Support Vector Regression (SVR)
- Neural Network

### 4. Results

The performance of each model was assessed using Mean Squared Error (MSE), Mean Absolute Error (MAE), and R-squared (R2).

- Linear Regression:
  - MSE: 5001.109
  - MAE: 47.866
  - R2: 0.9999
- Polynomial Regression (degree=2):
  - MSE: 5076.965
  - MAE: 48.762
  - R2: 0.9999
- RandomForest Regression:
  - MSE: 11967.495
  - MAE: 69.759
  - R2: 0.9999

- K-Nearest Neighbors (KNN):
  - MSE: 10227.715
  - MAE: 69.605
  - R2: 0.9999
- Support Vector Regression (SVR):
  - MSE: 25635.503
  - MAE: 118.338
  - R2: 0.9997
- Neural Network:
  - MSE: 4667958.791
  - MAE: 1788.441
  - R2: 0.9487

## 5. Conclusions

- Linear Regression and Polynomial Regression (degree=2) outperformed other models with extremely low MSE, MAE, and high R-squared values.
- RandomForest Regression and KNN also showed robust performance.
- SVR exhibited higher errors compared to other models.
- The Neural Network, while having higher errors, achieved a respectable R-squared value.