Intro to AI

Final Coursework Assessment

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# Question 1

## Introduction

The task is to build a model to predict the adjusted close price of Apple Inc. on a given day using the open, high, low and close prices from that day as features. The fintech\_coursework.csv file contains the four input features and the correct outputs (adjusted close price) relating to Apple Inc. stock prices between 03/01/1995 and 31/12/2021. Clustering algorithms are used for unsupervised learning and classification algorithms are used for supervised learning where the output labels are discrete values. This is a supervised learning task with continuous output values therefore a regression algorithm should be used.

## Methods

This task requires two supervised learning regression algorithms to be used. I will build, optimize and compare a Lasso Regression algorithm and a Neural Network. I will evaluate my results against a baseline which always uses the Close Price for the Adjusted Close Price prediction.

The performances of the algorithms will be evaluated using three metrics: adjusted R2 score, root mean squared error (RMSE) and mean absolute error (MAE). Compared to R2 score, I chose to use the adjusted R2 score as it is more precise than the R2 score as it penalizes additional independent variables (input features) and helps to prevent overfitting. The value will be between 0 and 1, where a larger adjusted R2 score (between 0 and 1) indicates a better fit to the dependent variable. I have also chosen to measure the RMSE and MAE which are absolute measures of the goodness of the fit (the main difference is that RMSE penalizes large errors) because they are more useful for comparing the performance of different models[[1]](#footnote-1).

The hyperparameters of the Lasso regression algorithm are alpha and test set split size. I will tune alpha using a cross-validation grid search and find the best train test split using a graph.

Describe how you will choose the hyperparameters of the algorithms. Explain which hyperparameters you have selected for each model using tables or plots to illustrate your decision.

## Results

Report the results of your models. Use tables or plots as appropriate to illustrate your results.

1. <https://towardsdatascience.com/what-are-the-best-metrics-to-evaluate-your-regression-model-418ca481755b> [↑](#footnote-ref-1)