Luke Scott

COSC 311

Project 2

Dr. Wang

**Project Report**

------ Part 1 -------

1. A picture containing screenshot, colorfulness, diagram, graphics

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   1. I loaded the data, then split it into X and Y values, Y corresponding with the room numbers, and X corresponding with the signals. I then used kmeans to find the centers of the clusters, and plotted them on a scatterplot.
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   1. The model was highly accurate when predicting rooms one and two, however struggled with predicting rooms 2 and 3. 75 samples were incorrectly predicted into room 3 but actually belonged to room 2.

------ Part 2 -------

1. I conducted a PCA analysis on the digits dataset and found a variance of around 84% when using 3 components. I increased this value to 5, acquiring a 94% accuracy and then transformed the data into 5 dimensions.
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   1. To build the classification model, I used a Decision Tree Classifier and used 10 folds for the CVT. The CVT average accuracy was 84% and was successful.

------ Part 3 -------

1. A picture containing screenshot, text, square, rectangle

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   1. I conducted a correlation matrix on the dataset, and found that ‘housing\_median\_age’, ‘total rooms’, and ‘median\_income’ had the highest correlation with ‘median\_house\_value’. I chose these three attributes to split the data.
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   1. Split the data.
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   1. Using the training data, I built a Multiple Linear Regression model and tested using the test data. The corresponding performance of the model is shown.