**Deep Learning: Dogs vs. Cats Classification**

Exploring image classification between cats and dogs, this blog will distinguish the changes enabled when a CNN model is fitted into the data with added features.

To start with, the dataset was loaded into Colab and explored to check if the training and validation sets contained the same number of images of cats and dogs, if not it would show an error message of unbalanced data. The images were processed using ‘ImageDataGenerator’ to rescale all the pictures ton the same size pixels and into a batch size of 32.

Regarding Model architecture, a few different pre-trained models were tried to see what would be compatible with the data given such as VGG16 and ResNet50 CNNs. Convolutional, Dense layers, Learning Rate and Dropout were added to also leverage the base models. The model was also compiled with the ‘adam’ optimiser and with all these features, a low epoch of 5 was used as it is a large scale of data for the machine to use so would take a very long time with a high amount of epochs.

A black screen with white text

Description automatically generated

A graph of a train and model loss

Description automatically generated

As shown in the graph, there was a low loss of images when the epochs were processed where the highest amount on the test was 0.2.

Evaluation

After training the ResNet model, an accuracy of 0.9689 was outputted which increased higher than the use of VGG16 where there was an output of 0.5 for the accuracy. When MaxPooling was used, the accuracy increased, however there was still a high disparity between the accuracy of test and train data, so the use of Dropout and the change of Learning Rate. Also, when an epoch of 5 was used, there was a high disparity between the first epoch and the last epoch (0.05 for the first epoch and 0.98 for the last epoch).