# Phase 3 Data Science Report

Introduction:

I chose to use the horse label for my model

Model Process:

First off, I reworked the data into 32x32 arrays that could be used in the model. Then I created the training and testing data with half of the data being images of horses and the other half being an even split of the other possible objects. The shape of my models is made up of two maxPooling layers, one Conv layer that has 64 filters, a flatten layer and two dense layers one with 64 nodes and another with 1 node which was the output. I included the accuracy metric and trained the model for a maximum of 200 epochs. I also used the adam optimizer with the learning rate of 0.001 and the BinaryCrossentropy as my selected loss.

I used BinaryCrossentropy for my loss as it calculates how close the output probability between 0 and 1 is to the real value which is either 1 or 0 which works very well with my model. I used the Adam optimizer with a learning rate of 0.001 as that is a good default learning rate for the Adam optimizer. I used the Adam optimizer as it handles sparce gradients on noisy problems well and is generally a good optimization algorithm for deep learning.

Model Performance:
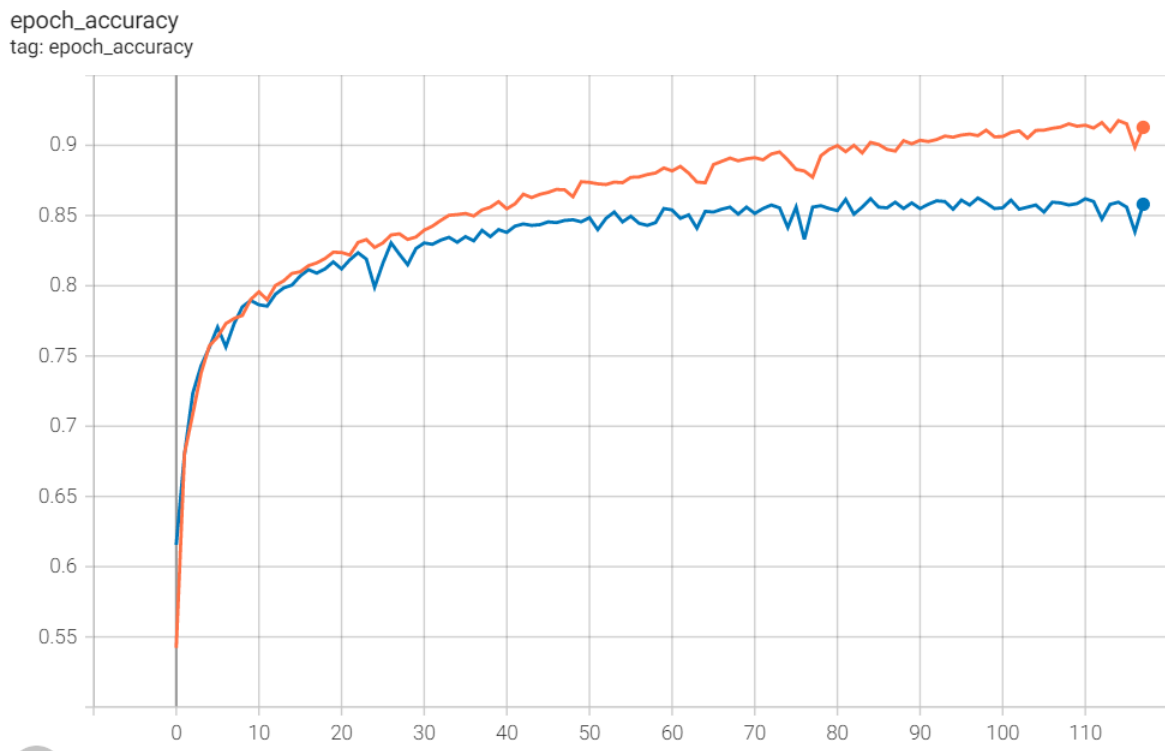
The orange line is the accuracy, and the blue line is the validation accuracy

epoch_loss
tag: epoch_loss
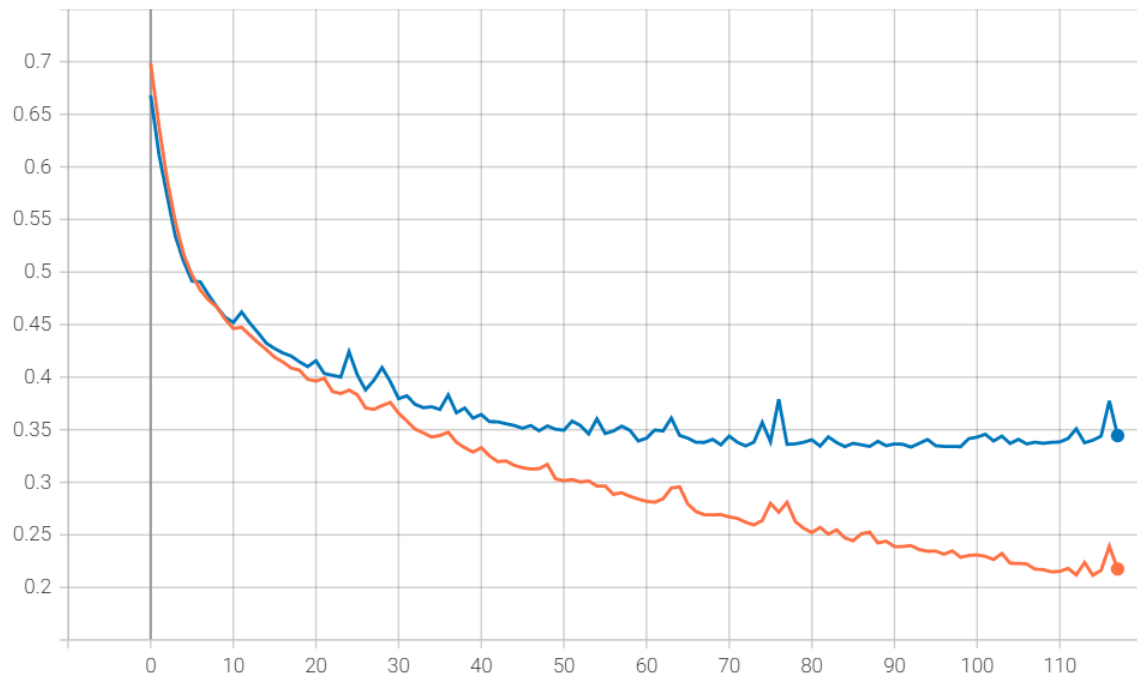
The orange line is the loss, and the blue line is the validation loss

The results show good and accurate results how ever the validation loss was quite bad.

Conclusion:

Overall, the model seems to be working well and the option of the horse for the label may have caused the model to mistake images of deer for horses. The model may have benefited from more filters in the conv2D layer to help with that issue. The hyper parameterization also worked well and got the model to the to an accuracy of 0.8605 which was 2% more accurate than the original model. The python function to allow any image to be predicted by the model also worked very well and was very confident that the image it was shown was a horse which showed again that it can work well on resized images.