Deep Learning using Keras:
Predicting Dog Breeds

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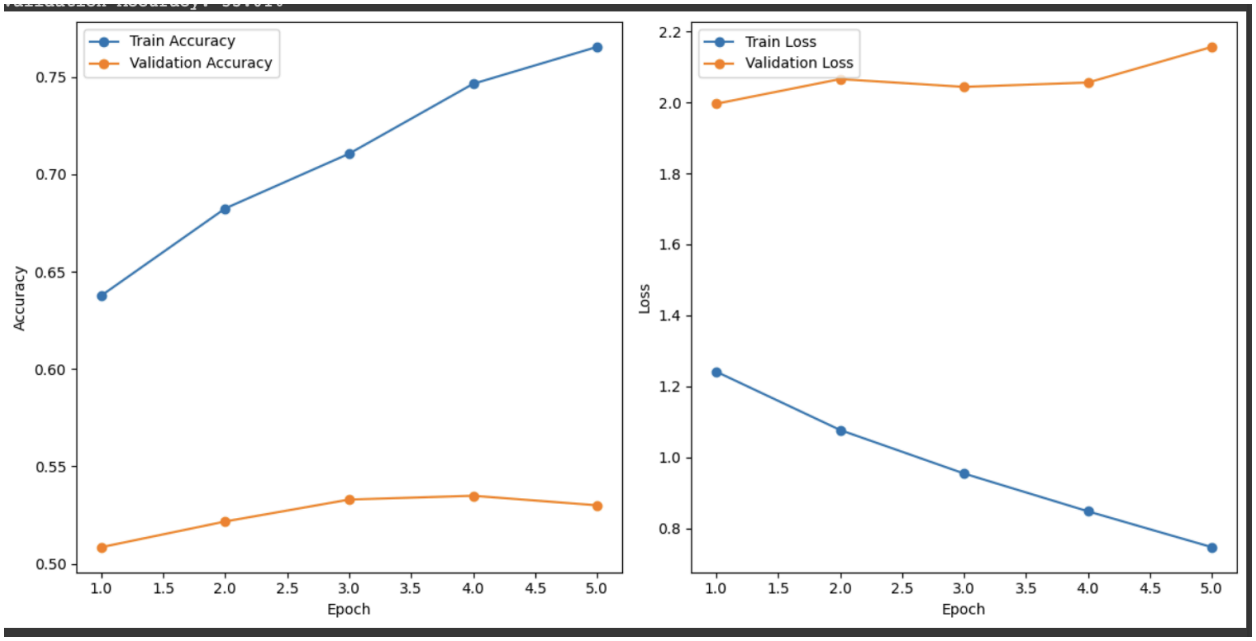
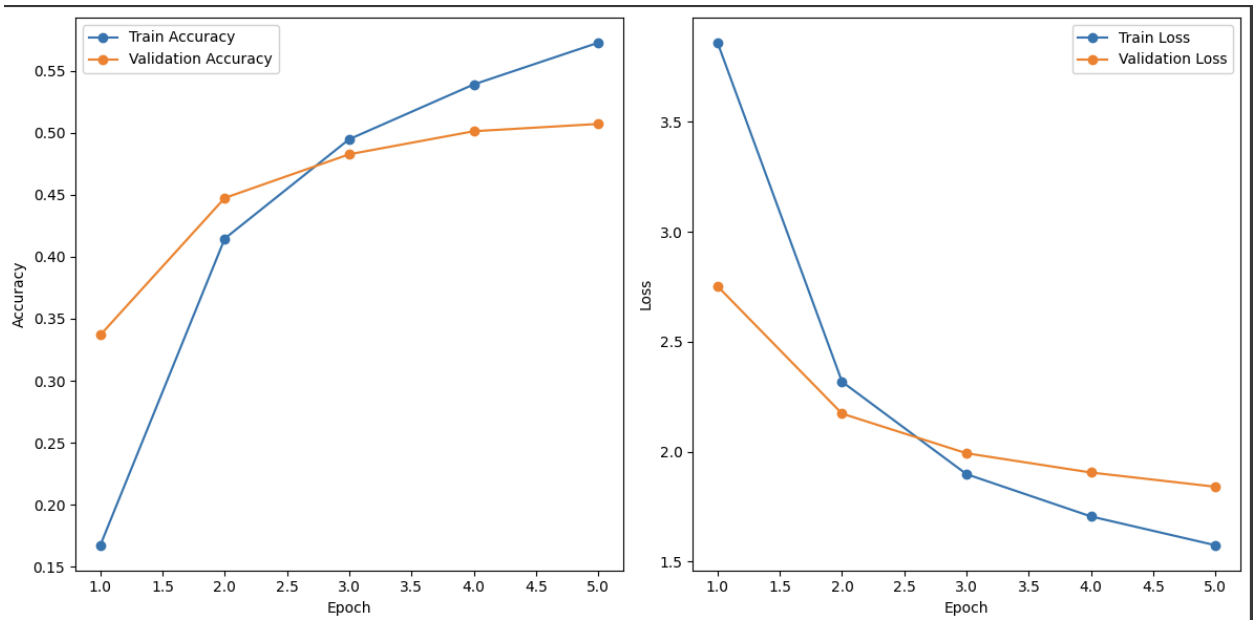
History Plots

The parameters for each iteration can be seen in the table below.

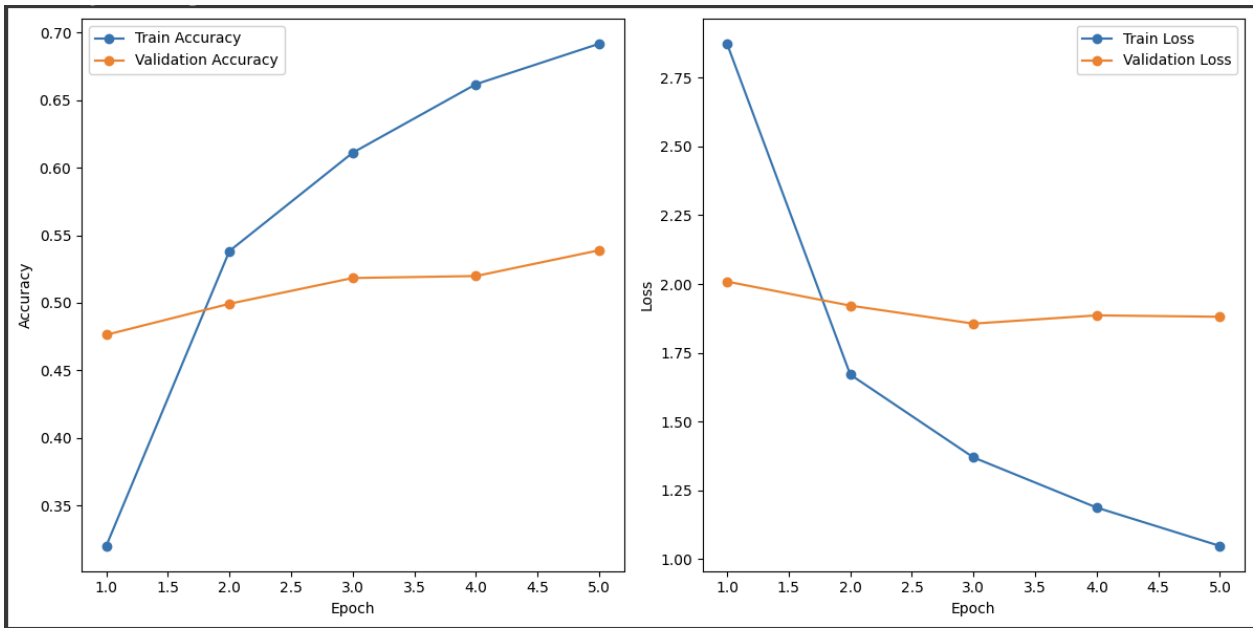
Iteration 1:



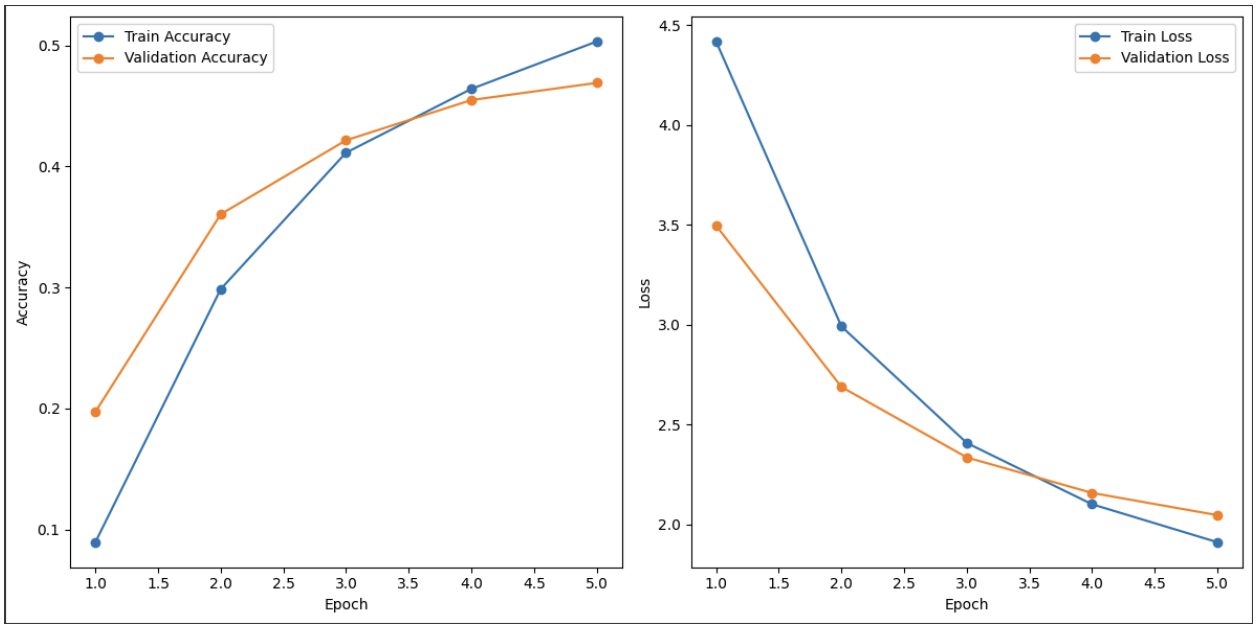
Iteration 2:



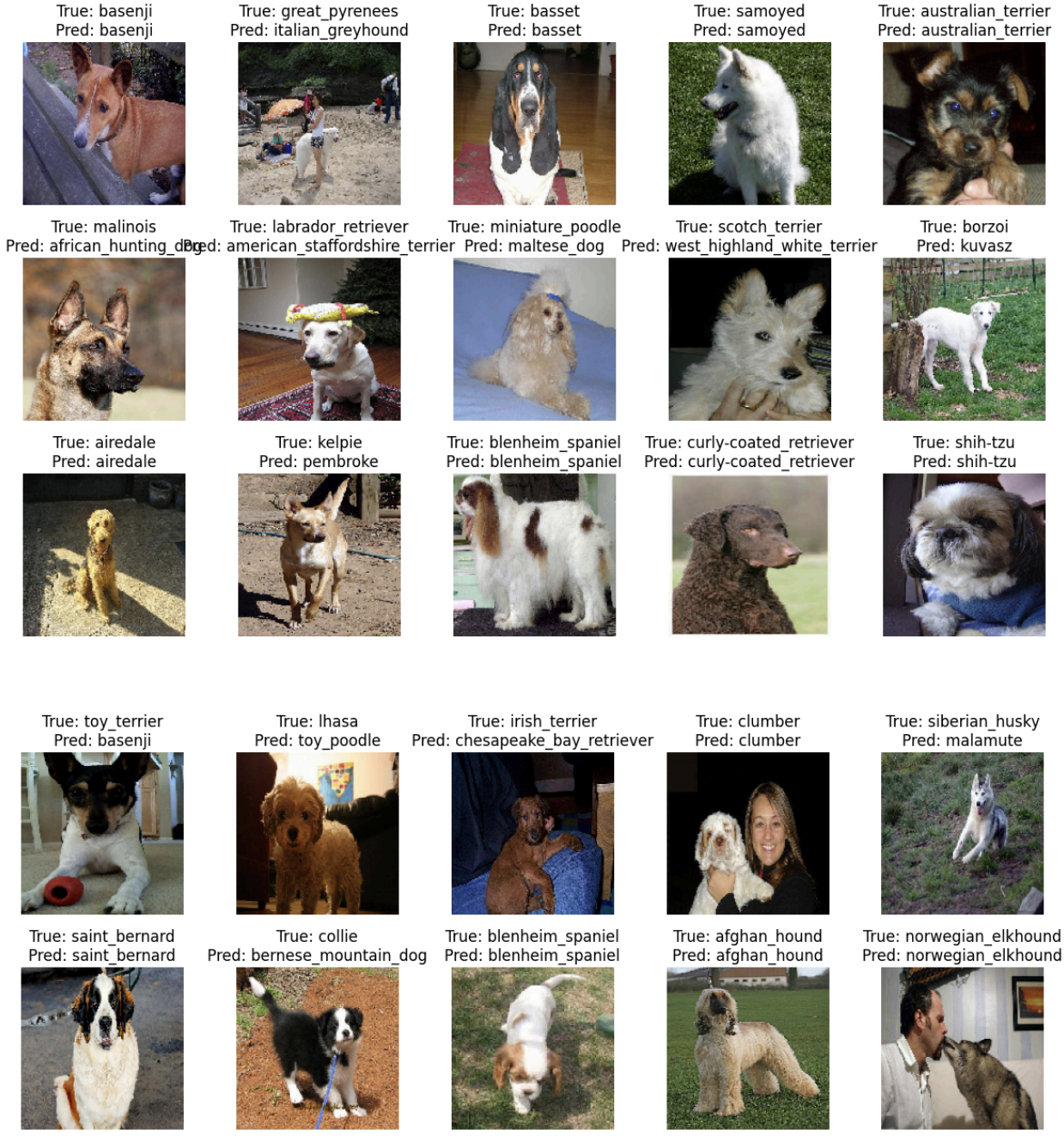
Iteration 3:



Iteration 4:



Example Data Points (from iteration 1)



Parameter Testing and Tuning

The notable parameters for our model can be seen below. For parameter tuning, we decided to focus solely on batch size and optimizer for various reasons. Firstly, we could not change the activation function as the softmax function allows us to easily derive a percentage likelihood for each big breed on each data point, with the probability of each breed summing to 1. Altering this would fundamentally change the output and would negatively impact our project. We chose to stay at 5 epochs mostly due to computing constraints, as a higher number of epochs would be hard for our hardware to compute and would likely take too long. Lastly, we chose to keep image size the same since 143 corresponds to a 12x12 square, fitting with the square form of the images, and image size not being particularly impactful for our model in the first place. Thus, we stuck with only tuning batch size and optimizer. For batch size, we did not want to try values too small (to avoid long computation times) or too large (to avoid a lack of generalization) so we chose to look at 32 and 64. For loss function, we checked adam and sgd since these are the two most commonly used loss functions for this kind of model.

* = Changing Parameter

Iteration	Parameters	Training and Test Accuracy
1	*Batch Size = 32 *Optimizer = Adam Image Size = 143 Activation Function = softmax Number of Epochs = 5	Train = 76.53% Test = 53.01% Loss = 2.1564
2	*Batch Size = 32 *Optimizer = SGD Image Size = 143 Activation Function = softmax Number of Epochs = 5	Train = 57.26% Test = 50.71% Loss = 1.8399
3	*Batch Size = 64 *Optimizer = Adam Image Size = 143 Activation Function = softmax Number of Epochs = 5	Train = 69.18 % Test = 53.89% Loss = 1.8808
4	*Batch Size = 64 *Optimizer = SGD Image Size = 143 Activation Function = softmax Number of Epochs = 5	Train = 50.31% Test = 46.8 % Loss = 2.0456