**Assignment 2: Sample Sizes and Network Choices in Image Classification**

**Introduction**

In this assignment, I am exploring the relationship between training sample sizes and the choice between training a Convolutional Neural Network (ConvNet) from scratch and using a pre-trained network for image classification. The goal is to evaluate the impact of different training sample sizes on the model's performance and compare results between models trained from scratch and pre-trained models.

**Part 1**

In this part, I started with a training sample of 1000 images for the Cats & Dogs image classification task. I developed a ConvNet, applied data augmentation and regularization techniques, and evaluated the models performance. The model achieved accuracy of [insert accuracy] on the test data.

**Part 2**

Next, I increased the training sample size to 5,000 images while keeping the validation and test datasets the same. I optimized the model for the larger dataset and observed improvement. The accuracy of the test dataset increased to [insert accuracy].

**Part 3**

I experimented with different training sample sizes to find the optimal size for the best prediction results. After customization, I achieved a test accuracy of [insert accuracy].

**Part 4**

I explored the use of pre-trained ConvNet architectures such as VGG16. By adapting and fine-tuning the pre-trained model, I achieved a test accuracy of [insert accuracy].

**Conclusion**

The relationship between training sample size and model performance is evident. As the sample size increases, the model's accuracy improves. Training from scratch provides flexibility but can require larger sample sizes and more training data. Pretrained models offer a head start with smaller datasets, making them a valuable choice in many scenarios.

\*I was not able to get the data set to upload so I wrote that code that I think would work for this assignment. I thought I would be able to get some points for writing the code and the report even though I do not have answers. For the [insert accuracy] parts in the report that is where I would put the answers if I could get the data set to upload. I am sorry this is not fully complete.\*