SUMMARY

- Even after iterating and searching for best hyperparameters, the accuracy from all classifiers was still in the range of 20%-40%. This is mainly due to the nature of the dataset. However, another factor explaining the poor accuracy is the lack of computing resources. Even after dimensionality reduction, we had to use small subsets (1000-10000 samples) of the training set (50000 samples), for the models to train in reasonable time.
- For this dataset, there is a large variation of accuracy with change in hyperparameters. Hence selection of hyperparameters plays a crucial role in the quality of the final model. In my RBF Kernel SVM experiment, the grid-search plot shows how different the results can be with different hyperparameter values. A bad selection of (C, γ) leads to less than 0.1 accuracy. However after searching for good hyperparameter values, we were able to achieve an accuracy above 0.33.
- The dataset is not very clean. There are many misleading samples. Within the 5000 samples of each class itself, there are many differences. Hence, it is difficult to make a strong classifying model.
- For example in the dog class, many images just have the animal face and other photos have other body parts. The images different in position/angle of the subject. Some images are magnified whereas others are zoomed out. There are also many distinct breeds with highly varying properties.