CS 598: Methods for Building Autonomous Vehicles

Assignment 1

Name: Devansh Shah, Jatin Arora, Keval Morabia

18.5:

(a) Downloaded images from **google.com** and getting the following error rates (top-1 and top-5) on pre-trained **ResNet-18**, run using the **torchvision** library.

Also, downloaded the ImageNet validation set images with their gold class labels and ran the same pre-trained ResNet-18 model on classes of interest.

Class Name	**Top-1 Error Rate (%)**		**Top-5 Error Rate (%)**	
	ImageNet (**Val**)	Google Images (**Test**)	ImageNet (**Val**)	Google Images (**Test**)
Black Stork	22.00	**0.00**	4.00	**0.00**
Cougar	**8.00**	23.68	**4.00**	5.26
English Setter	28.00	**26.53**	**4.00**	12.24
English Springer	**16.00**	48.00	**2.00**	12.00
Grey Whale	**16.00**	21.74	8.00	**6.52**
Kit Fox	**40.00**	48.89	4.00	**2.22**
Lesser Panda	**6.00**	9.09	4.00	**0.00**
Porcupine	**12.00**	26.19	**4.00**	21.43
Sea Lion	**12.00**	19.15	**8.00**	8.51
Siberian Husky	**70.00**	81.82	**4.00**	4.55
Overall (10 class)	**24.00**	30.33	**4.60**	7.25

Observation and Conclusions:

1) We observe a general trend that validation set errors are lesser as compared to test set images. This is coherent with our belief that ImageNet validation set images may have a slightly different distribution as compared to images downloaded in an adhoc way from google search. Since the pre-trained model is tuned using the validation set so it does not perform that well on our test set.
2) At the same time we see some similarities as well, like for *Siberian Husky*, top-1 error is 70% (Val) and 81.81% (Test). This shows that the validation set is a decently good representation and its deviation from real world images is not too much.