HW4
Data Augmentation Report

Overview

- Experiments and parameters for Problems 1, 2 and 3 can be seen in the HW4-data-augmentation.py script.
- The predictions are done for the first 250 images of ImageNet, i.e. ILSVRC2012_val_00000001.JPEG - ILSVRC2012_val_00000250.JPEG.

Problem 1

Architecture	Resized	**Normalized**	Crop Size	Crop Type	**Accuracy**
ResNet-18	224	**True**	224	Center	**68.8**
ResNet-18	224	**False**	224	Center	**46.4**

Problem 2

- The bonus FiveCrop(), ToTensor() and Normalize() classes are implemented in bonus_classes.py and used in experiments when crop_type='bonus'.

Architecture	**Resized**	**Normalized**	Crop Size	**Crop Type**	**Accuracy**
ResNet-18	**256**	**True**	224	**Five**	**71.2**
ResNet-18	**256**	**False**	224	**Five**	**45.2**
ResNet-18	**280**	**True**	224	**Five**	**70.4**
ResNet-18	**280**	**False**	224	**Five**	**46**
ResNet-18	**256**	**True**	224	**Bonus**	**71.6**
ResNet-18	**256**	**False**	224	**Bonus**	**44.8**
ResNet-18	**280**	**True**	224	**Bonus**	**70.4**
ResNet-18	**280**	**False**	224	**Bonus**	**46.4**

Problem 3

- Since all the pretrained image classification architectures at https://pytorch.org/docs/stable/torchvision/models.html work out of the box for Tensor images of size (3, 330, 330), no changes are made to the two chosen architectures, ResNet-18 and DenseNet-121.

Architecture	Resized	**Normalized**	Crop Size	Crop Type	**Accuracy**
ResNet-18	330	**True**	330	Center	**68**
ResNet-18	330	**False**	330	Center	**44.4**
DenseNet-121	330	**True**	330	Center	**70.4**
DenseNet-121	330	**False**	330	Center	**68.4**