Lab Data: [Google Drive Link](https://drive.google.com/drive/folders/1GLHQAt3KNN_3eIETkinzlY5q9HG44Blx)

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The following resources may also be helpful as you complete this lab:

<https://pytorch-for-numpy-users.wkentaro.com/>

<https://pytorch.org/tutorials/beginner/basics/data_tutorial.html>

<https://pytorch.org/vision/stable/transforms.html>

### Assignment

Your assignment is to complete the four parts indicated in the Jupyter notebook. The instructions for how to complete the lab are inside the Jupyter Notebook. However, if you choose, you can complete the lab inside a standard Python file rather than the notebook. Once you have completed the four parts, submit your assignment by submitting your notebook or python file through Canvas. **Do not upload the training or testing data.**

The following resources may also be helpful as you complete this lab:

* [PyTorch for Numpy UsersLinks to an external site.](https://pytorch-for-numpy-users.wkentaro.com/)
* [PyTorch Data Loaders TutorialLinks to an external site.](https://pytorch.org/tutorials/beginner/basics/data_tutorial.html)
* [Transforming Images in PyTorchLinks to an external site.](https://pytorch.org/vision/stable/transforms.html)

**Note:** Students should try to complete the lab on a Windows machine with access to GPU resources or a Mac machine with an M1 or M2 processor chip. Otherwise, the training process will be very slow. On-campus students are advised to use the computers in Austin 208. When the completed lab was run on those machines, it had the following run times.

* Training loop time on CPU with no standard image size and batch of size 1 = 50 minutes
* Training loop time on CPU with standard resize/cropping of (256, 256) and batch size of 1 = 15 minutes
* Training loop time on CPU with standard resize/cropping of (256,256) and batch size of 8 = 7 minutes
* Training loop time with MPS acceleration with standard resize/cropping of (256,256) and batch size of 8 = 2 minutes

With proper handling of the data and use of ECU machines, students should be able to train the network in a reasonable time. Online students that find that their training loop takes too long on their personal machine should contact Dr. Hart.