Lab 8 Working on Discovery
Due 11/12/2024

1 Introduction

Running large jobs on your local computer can take a very long time. This is where Cloud computing/High performance computing (HPC) comes in handy. However, getting access and the environment set up in a way that you can run jobs can be a bit tricky if you have never done it before. This lab is designed to get you familiar with working on a HPC.

2 Set Up

Northeastern has their own HPC called the Discovery Cluster. I have requested course access for every student in CS5330 to have access to your own environment to work on. I also created a local Conda environment that already has the libraries that you need to use for this class pre-installed. To start, you must sign into Discovery Open On Demand. Your sign-in should be your universal sign-in for all Northeastern account. i.e your Canvas sign-in. From there you can request to create a JuypterLab partition under the courses drop down menu.

Once you get to the JupyterLab tab, you will be asked to select/enter in a few prompts.

The follow is a list of what I used to create my environment for lab8.

- Select Local Anaconda Install -> /courses/CS5330.202510/share/CS5330/bin
- Working Directory -> /courses/CS5330.202510/students/[your username]
- Select a partition -> courses
- Time -> select how much time you think you will need. The more time you request, the longer it might take to get access.
- CPUs -> select how many CPUs you might need. (for this assignment 2 is plenty.) The more you request the more time it will take to get access.
- Memory -> select how many Memory you might need. (for this assignment 2 is plenty.) The more you request the more time it will take to get access.

Once you create your environment, you will have to wait until it can be accessed. If you requested for a large amount of Time, CPUs, GPUs, and or Memory, it might take some time to get access. If there is a lot of other students trying to request access, it will also take a lot of time... **DO NOT wait until the last day to work on your assignments. Every other student will also be requesting access and you will not get access in time to finish your assignment. That will be on you and you will fail the assignment.**

3 Lab

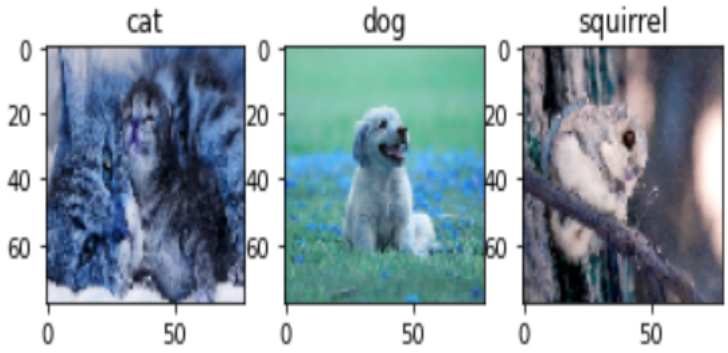
Now that you have gotten access to your partition and you have open cv installed we can final work on the lab itself! For this lab you will need to be able to access the data that is stored on the courses directory under data/Lab8. In most all deep learning projects, you will need to be able to iterate over every image in a given directory, resize the images to make sure that they are all the same size, and be able to know what class that they belong to which is usually stored as part of their file name followed by a unique number (i.e Dog-1118.JPEG).

Read in every image that is in the data/Lab8 folder by looping through all images in the folder and extract the class name from the image name. (The exact path will be "**/courses/CS5330.202510/data/Lab8**" or "**../../data/Lab8**".) Resize each image to 78 x 78 pixels, and then display each image in a subplot with the title of each subplot set to what class each image belongs too. Because there are only 3 images you can technically hard code each title but it is typically done using regular expressions when there are several thousands images.

4 Grading (Out of 100 points)

- 10 Points : Add your name and date to the beginning of your code.
- 10 Points : Use appropriate comments throughout your code.
- 30 Points : You are able to read in every image in the Lab8 folder.
- 20 Points : You are able to resize each image to 78 x 78 pixel

- 30 Points : You display each image with the appropriate title.



5 How to turn in

You do not need to turn anything in. Because you are working on Discovery the TA should be able to access your file and view your output of your notebook directly on Discovery. The TA will use the output of your notebook to grade. Make sure that your notebook has ran and the results are displayed. The TA should not have to run your code.

Good Luck Cat!