

CSE 559A: Fall 2020
Problem Set 0 (Ungraded)
Due: Sep 22, 2020. 11:59 PM

Instructions

Please read the late submission and collaboration policy on the course website:

<http://www.cse.wustl.edu/~ayan/courses/cse559a/>

Install Anaconda for Python 3.6 from <https://www.anaconda.com/download>. We will test all code on this distribution. You can install it locally in a separate directory without interfering with your system install of Python.

1. Complete the code files in `code/` by filling out the required functions.
2. Run each program to generate output images in `code/outputs` directory.
3. Create a PDF report in `solution.pdf` with \LaTeX by editing `solution.tex`. In particular, make sure you fill out your name/wustl key (top of the `.tex` file) to populate the page headers. Also fill out the final information section describing how long the problem set took you, who you collaborated / discussed the problem set with, as well as any online resources you used.
4. The main body of the report should contain responses to any math questions, and also include results and figures for the programming questions as asked for. These figures will often correspond to images generated by your python code in the `code/outputs/` directory.
5. Once you are done, “git add” the completed `solution.pdf` and your updated code files in `code/*.py`. Please do not add the generated output images, as these are already in your report (the git repo is setup to ignore those files). Then do a “git commit”, and a “git push”. Then, do a “git pull”, and a “git log” to verify the timestamp of your submission and the files included. These instructions are also explained in the “problem-sets” section of the course website.

As a general guideline for all problem sets: Write efficient code. While most of the points are for writing code that is correct, some points are allocated to efficiency. Above all, try to minimize the total number of multiplies / adds. For the same number of underlying operations, try to keep the use of `for` loops to a minimum (i.e., over a minimum number of indices). Instead, use convolution, element-wise operations over large arrays, calls to matrix multiply, etc.

PROBLEM 1 (Total: 0 points)

The purpose of this problem set is to verify your local Anaconda and GIT installations, and for you to test out the homework submission workflow. Although the problem set is ungraded, you are required to complete it to continue in the course.

You simply have to edit `code/probl.py` which loads an image and then saves vertically and horizontally flipped versions of it. You only need to edit the `vflip` and `hflip` functions in the code.

(a) Edit the `vflip` function that vertically flips its input. The solution for how to do this actually in the code, but commented—so you only have to un-comment that line of code. Once you do this and run `code/probl.py`, the file `code/outputs/flipy.jpg` should have the correctly vertically flipped version of the input image `code/inputs/cat.jpg`. Include this flipped image in your report.

(b) Edit the `hflip` function to horizontally flips its input. This should just be a simple modified version of the `vflip` function. Running `code/probl.py` also generates `code/outputs/flipx.jpg`, that should now have the correctly horizontally flipped output. Include this in your report.