

## CS 481/ECE 437 Spring 2020 Lab 2

Lab 2 is due by 11:59pm on March 31<sup>st</sup>, 2020

Submit your poster as a 1-page 8.5 by 11 inch PDF by uploading it into Learn in the Lab 2 assignment there. Failure to follow these instructions may result in a zero on the assignment, so **DO NOT SEND YOUR LAB AS ANY OTHER TYPE OF DOCUMENT BESIDES PDF.**

Lab 2 is worth 100 points. You are strongly encouraged to continually run your thoughts/plans by me and by your classmates, this includes identifying the factors and response, analyzing the data, *etc.*

You are expected to do your own work. From designing the experiments to writing code needed for them to analyzing the results, for all phases of this project you should do your own work. Any instance of not doing your own work will be considered cheating. For your submission, if you copy from any source without attribution that will be considered cheating. If you're not sure whether something will be considered cheating or not, ask me before you do it. Because the design of the experiment is open ended, it is expected that every student will have a different experiment. This is another reason to run all of your ideas and initial results and everything by me, so that if two students by chance picked the exact same experiment we can catch that early so nobody gets accused of cheating.

You are encouraged to discuss the assignment with your classmates at any level of detail that is helpful so long as you are still doing your own work (designing your own experiment, writing your own code, *etc.*). Exchanging tools, source code, *etc.* that existed before the assignment was assigned (**BUT IS NOT RELATED TO LAB 2 FROM THIS SAME COURSE LAST YEAR**), and either general thoughts or specific instructions about approaches to specific problems is okay. Giving your classmates ideas about what man pages to look at (*e.g.*, you should check out a command called `ls` for looking at file descriptor tables) is okay, and (unlike Lab 1) giving full commands including all the arguments they need is also okay. As a reminder of the course policy, if you cheat on any assignment in this class including this assignment (cheating includes, but is not limited to, representing somebody else's work as your own or having someone else do the assignment for you) you will receive an F in the class and it will be reported to the Dean of Students. If you want to share source code written for the assignment with a classmate, you should get my permission first and share it with the whole class. (Note: for this assignment source code could mean a sequence of commands or a bash script.) Save all of the raw data (*e.g.*, program outputs) that you generate for this lab in case I ask to see it.

Modulo all of the above, don't hesitate to discuss the assignment with your classmates. I want students to work together to test each other's ideas, but if someone is simply copying answers I need the above language to refer to when I go to the Dean of Students about it. But please don't let the above language discourage you from engaging with your classmates about this assignment. If you're not sure how in-detail you can share information with your classmates, just ask me. For this assignment I want students to have detailed technical discussions at levels of detail that would have been forbidden on Lab 1.

This is what you will do:

- Form a hypothesis.
- Design an experiment, including identifying at least one factor with multiple levels and one response.
- Carry out the experiment.
- Analyze the data and come to some kind of conclusion.

- Create a “poster” on a single 8.5 by 11 inch page that describes as succinctly as possible what you did, with visual aids such as a graph. Your poster, at a minimum, should convey your hypothesis, what you did to test it, and what the results were.

Based on the slides we went over in class, here is what you should base your experimental design on:

<https://www.cs.unm.edu/~crandall/netsfall15/lecturenotes/doeintrochapter1.pdf>

You should form a hypothesis about how the Linux kernel manages the page table of processes and the implications that has for physical memory usage and performance, then test that hypothesis and write it up as a poster. The poster should not have too many words on it, just enough to state your hypothesis, describe what you did succinctly, (this one is important...) state the potential sources of bias and distortion that you enumerated and how you accounted for them, and show the data. You can use statistical hypothesis tests if you like, but you can also simply plot two sets of data to show how they compare.