

# CS 279 - Exam 1 Review Suggestions - Fall 2022

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## Exam 1 BONUS Opportunity

- You can receive (a maximum) **\*5 POINTS BONUS\*** on Exam 1 if you do the following:
  - Make a **hand-written** Exam 1 study sheet (a single sheet of paper, no larger than 8.5" by 11", on which you have hand-written as much as you would like on one or both sides)
  - Submit a photo or scan of it saved as a .pdf, .png, .jpg, .gif, or .tiff to Canvas **by 9:00 am on Wednesday, September 28** such that I can read at least some significant CS 279 Exam 1 material on it.
  - Please let me know if you have any questions about this, and I hope it helps you in reviewing course concepts more effectively before Exam 1.
  - You are **encouraged** to have this **at hand** as you are taking Exam 1.

## Exam 1 Set-up

- You will take Exam 1 in TA 011 on Wednesday, September 28.
  - You are expected to work **individually** on the exam -- it is not acceptable during the exam to discuss anything on the exam with anyone else.
  - You may have your Exam 1 study sheet on hand during the exam. Otherwise, the exam is closed-note, closed-book, and closed-computer/closed-electronic-devices.
  - I expect there will be some multiple-choice questions, and the rest will be short- to medium-answer questions.
- Your studying should include careful study of posted examples and notes thus far.
- You are responsible for material covered in class sessions, lab exercises, and homeworks through and including the Week 4 Lab Exercise (Thursday, September 15) and Homework 3 (due 11:59 pm on Friday, September 23).
  - This review handout is intended to be a quick overview of especially important material.
  - TIP: It is **perfectly fine** to retake/read over the short-answer questions in Canvas from Homeworks 1, 2, and 3 as you are studying for Exam 1!  
  
These are set up for unlimited retakes, and only keep the highest score, so you will not hurt your grade by doing so!
- Remember that Linux/UNIX commands are **case sensitive** - for example, `LS` is not the same command type as `ls`. You are expected to use the correct case in your answers.
- You are also expected to follow CS 279 course style guidelines in your answers.

## concepts and history and miscellany

- should know what UNIX and Linux are...!
- should know how to `ssh` to nrs-projects
- what is POSIX? Why is it significant (what is its potential benefit?)
- what does a shell do/what is it used for? what are some common UNIX shells?

## Basic UNIX/Linux commands and conventions

- Commands discussed in class, including `cat`, `cd`, `chmod`, `cp`, `echo`, `ls`, `man`, `mkdir`, `mv`, `pwd`, `rm`, `rmdir`
  - AND the common command options that go with them (those used in class or course work)
  - what is a command you could use with these to try to access their UNIX manual pages?
  - you will likely be asked to write the command line you would use to accomplish a given task
  - you could also be asked questions about these commands
- you should understand what the `history` command does, and what it does when it is given an integer command line argument

## UNIX/Linux files and their characteristics

- The UNIX file system structure and absolute and relative paths
  - what is the name for the root directory of a UNIX file system?
  - given information about one or more directories and their contents, you should be able to give the absolute pathname for a particular file, or the relative pathname for a file starting from a given directory;
- what are the 3 kinds of files in the UNIX file system?
- what is a pathname? what is a filename? Understand and be able to use the nicknames `~` and `.` and `..` (by themselves, and within pathnames)
  - what do the commands `basename` and `dirname` return?
- what is an "invisible" file? Why is it considered to be "invisible"? How is such a file named? How can you view it, anyway? What is the typical/traditional purpose of such a file?
- Creating, Deleting, and Modifying Files and Directories
  - how can you make a copy of a file? ...copy a collection of files into another directory?
  - how can you rename a file? ...move a collection of files into another directory?
  - what are some of the numerous ways to create a file in UNIX?
  - how can you remove a file? ...a directory? (note that `rm` without the `-r` option won't remove a directory, and that `rmdir` can only be used to remove an empty directory)

- File and Directory Permissions -- User(owner)/Group/Other(world), Read/Write/Execute
  - how can you view a regular file's permissions? how can you view a directory's permissions?
  - be able to use `chmod` to set or change a file's permissions - you should understand octal notation for this at this point
- you should understand and be comfortable calling the following commands; you should know how they can be useful, when you might use them, and their effects and/or output when called:
  - `wc`
  - `touch`

## intro to the bash shell

- What is Command History? You should know at least one way to rerun previous commands.
- Output Redirection, Appending - should understand what these mean, and how to do them
- file globbing using the wildcard character `*`
  - example possibility: given a pattern using one or more `*` instances and several file names, you would say for each whether they would be matched or not
  - or, given a directory's contents and a pattern using one or more `*` instances, and you would list which would be output by an `ls` command using that pattern
  - or, given a pattern using one or more `*` instances, you might need to give an example of a filename that it would match, and one that it would not match;
  - and of course you might have to give a pattern using one or more `*` instances that would match specified files
- How can you use the `echo` command to print to standard output?
- should understand, and be able to read and write, the 3 kinds of "quotation" discussed
  - what happens when a `\` precedes a character? (two general possibilities) What will be echoed when `echo`'s argument includes this?
  - what are the meanings of characters within a double-quoted string? What will be echoed when `echo`'s argument is such a string?
  - what are the meanings of characters within a single-quoted string? What will be echoed when `echo`'s argument is such a string?
- should be able to write simple `bash` shell scripts;
  - what should be the first line, to ensure that the commands are run using the `bash` shell?
  - how do you write comments in `bash`?
  - what permissions does a shell script need to be able to execute it? how can you execute a given shell script?

## more bash shell features

- backquoting/command substitution
- shell local variables
  - what is the scope/lifetime of each?
  - how can you create one? set it to a value? use it?
- you should be able to read, write and understand both styles of `for` loops discussed (both "list-style" and "classic")
- you should be able to read, write, and understand `if` statements
- you should be able to write tests (as can be used in `if` statements) as we have used so far in class, in lab exercises, and in homeworks
- how can you evaluate an arithmetic expression?
- you should be able to set and use local variables in `bash` shell scripts
  - what is the difference between using single quotes and using double quotes when a shell variable is involved?
- how can you escape special characters on the `bash` command line? within a command in a `bash` shell script?
- you should be able to write `bash` shell scripts that make use of command-line arguments
  - how can you find out the number of command-line arguments?
  - how can you get all of the command-line arguments? ...each individual command-line argument?
  - how can you get the name of the calling shell script?
- how can you do interactive input in a `bash` shell script?
- how can you exit a shell script at a specific point? what is the significance of the value you exit with?