

Computer Science 253 Final Exam

Spring 2020

Test Parameters:

- You can use a computer, like isoptera or whatnot.
- Open manual, Internet, etc.
- Feel free to print this out if you don't want to waste screen space on it.
- Do your own work.
- I'll have discord open for questions, but can't give away the answers.
- Put your answers in a text file, and make sure your name is in the filename
- If you turn in your source code to the last question separately, again make sure your name is on it.
- Use the turnin command like this: turnin filename 253
- After you turn it in, ask me to confirm that I've got it on discord.

Question 1: (15 points) Often, on isoptera, programs are being run named a.out. Create a command which will list all users who are currently running a command called a.out, with no duplicates.

Question 2: (15 points) Since posting this exam, a number of students have most likely downloaded it. Since everyone is off-campus, all the downloads are likely to have a unique IP address. Create a command that will list all the IP addresses which have downloaded S20final.pdf for CS253. Make sure not to accidentally list users from CS435, who downloaded a file with the same name yesterday. The web server log is in /var/log/apache2/access.log.

Question 3: (15 points) When looking for things with find in /etc, some permission errors are produced. Use find to look for files related to apache in some way that causes errors to print out, and then redirect them to /dev/null.

Question 4: (5 points) Running the command below, how many times is the program echo run? (Note: this uses the backtic, above the tab key on most keyboards and sharing a key with the tilde, rather than the single quote)

```
seth@annelid:~ $ `echo echo echo`  
echo
```

Question 5: *(10 points)* The source code for the linux kernel that is running on isoptera is located in /usr/src/linux-source-4.19. Use find, wc, grep, etc. to figure out how many lines are in .c files. My answer for this is 18,012,955. This excludes .h files.

Question 6: *(20 points)* The uname function, from manual section 2, will find information about the operating system and version. Write a brief C or C++ program that will print out the sysname, nodename, release, version, and machine from the utsname structure. Note that by doing this, you will have created your own version of the uname program from manual section 1.

Question 7: *(20 points)* Write a C or C++ program using getenv which will retrieve the value of PATH, and then print it out one directory per line. If both /sbin and /usr/sbin are on the path, print out a note that system programs will work (like ifconfig, service, etc). Remember to try it with PATH set to both include /sbin and /usr/sbin, and not include them. You can just use export to change path for testing - no need to use setenv for this question.