

CS390 Midterm Review

1. Understand ‘git’, how to add a new file to git repository, how to commit modified files to git and push to gitlab
2. What is “shell” in UNIX? Understand environment variable: PATH, HOME and how to define local and environment variables in bash
3. What is the command to reset your password from a shell?
4. In UNIX system, everything is **FILE**. Name and explain at least THREE of the SEVEN types of UNIX file
5. What’s the command to get online help on Linux/Unix? What are the differences b/w

```
man 1 printf &
```

```
man 3 printf?
```

6. Understand the following commands discussed in class which display whole or part of a text file to screen
(not vi or emacs)

- cat
- more/less
- head/tail (head -2 roster.txt, tail -5 roster.txt)

7. Command to display the number of words, lines, and characters in a text file (wc)

8. Fundamental directory operations:

- Create directory (be aware of **-p** option)
- Copy whole directory / Move directory to a new location
- Remove/delete directory (**rm -rf dirname vs rmdir dir**)

9. Fundamental file operations:

- Copy File (local and remote file transfer)
- Create file
- Create symbolic file

What does the following command do (myHW1 is the link file name to be created)

```
ln -s $HOME/cs390/hw1 myHW1
```

- Rename file
- Delete file

10. How to check/examine file permissions?

11. What are the significance of the following flag/options to “ls” ?

- -l
- -a or -A (same or different?)
- -r
- -R
- -ls (-lS)
- -lt
- -i

12. Understand EVERY character (letter) of the **first column**.

```
drwxrwxr-x  3 hlin csuser 4096 2006-09-06 12:06 public_html
-rw-r--r--  1 hlin csuser   0 2006-09-05 23:41 script.sh
lrwxrwxrwx  1 hlin csuser   0 2006-09-05 23:41 phonelist
```

13. Understand all the file permissions including two special permissions: **s** and **t**

15. Understand how to represent permissions in octave

16. How to modify file permissions? (**chmod**)

17. Explain the permissions in letters after each of the command:

- a. chmod 644 fname
- b. chmod 1755 fname
- c. chmod 552 fname
- d. chmod 123 fname

18. Explain the following permission operations (Note: * below means all the files in the current directory instead of one particular given file name)

- a. chmod u+x *
- b. chmod a-w *
- c. chmod u=rw *
- d. chmod u-x *
- e. chmod og-rwx *

19. Understand the types of compressed tarball (archive): .gz, .xz, .bzip2, how to create and decompress a compressed tarball, understand the following flags to “tar”

- c
- t
- x
- z (j or J)
- -C

“find” and “grep” utilities!

20. How to use “find” utility to search for image files (file ending with .png, jpeg, JPG or gif) starting from a preferred location, such as your home directory

22. How to find all the files whose name contains cs390, such as mycs390hw.txt, UAHcs390, etc. in the current directory and all its subdirectory (command to list from the current directory only)

23. Which utility program is used to find all the files which contain a word, such as “ITSC” in the current directory only?

24. How to find all the cpp files from the current directory and all its subdirectories which contains a variable name: **amsr2**?

25. Explain the significance of the following flags to “find”:

- a. **-type**
- b. **-atime | -mtime | -ctime**
- d. **-name | -iname**
- f. **-size**

26. Explain the differences of the following find commands”

- **find . -name *.txt |grep "Smith"**
- **find . -name *.txt | xargs grep "Smith"**

27. What is **pipe** and **filter** in UNIX? Explain with examples. How to remove duplicated lines?

28. What’s the difference between single and double quoting?

29. What is metacharacter? Explain with some examples.

30. Your current directory contains the following files: **ab abc a1 a2 a3 all a12 ba ba.1 ba.2 filex filey AbC ABC ABc2 ax, by, abc**, write the command that will do the following:

- a. list all files starting with *a*.
- b. list all files ending in at least one digit
- c. list files ending in a *x* or *y*
- d. list all files whose name contains two characters only
- e. remove two character files starting with a or A
- f. remove all three-letter file names
- g. copy all files that file name starts with letter **a** to /tmp directory

31. Explain the outcome of the following commands:

- a. **ls *[0-9]**
- b. **ls *.{cpp,h}**

32. Understand file descriptors 0, 1, 2 and how they are being used

33. Name the two modes of ‘vi’: insert and command modes

34. In ‘vi’, what this command do: **:1,\$s/CS390/UAH/g**

Regular expression with grep, sed & awk

35. Lines containing one single character only in a text file.

36. Lines starting with non-digital in a text file.

37. Lines containing consecutive seven digital numbers in a text file.

38. Add two white spaces at the beginning and end of each line in a text file.

39. Remove the first and last lines of a text file.
40. Display content of a text file to the screen up to the line containing "End." ONLY.
41. Example:

Tom	Jones	4421	5/12/66	543354
Mary	Adams	5346	11/4/63	28765
Sally	Chang	1654	7/22/54	65000
Jones	Black	1683	9/23/44	336500
Sally	Smith	1683	9/23/44	33650
Mary	Kaine	1683	9/23/44	336500

Content of file employee.txt is listed above. Explain the following commands

- a. `sed -n '/Jones/p' employee.txt`
- b. `sed '$d' employee.txt`
- c. `sed -n '/Mary/, /Sally/p' employee.txt`
- d. `sed -n '/\//2[0-9]\//p' employee.txt`
- e. `sed '/Mary/q' employee.txt`

How to add a line "The END" after the last line of file employee.txt? How to insert a title line:

"First Last Id DOB Salary" before the first line?

42. How to delete empty line? How to delete blank line including empty lines of a data file? (You might want to do this first before processing a data file)
43. Explain awk internal variable \$0, \$1, FS, NF, NR, \$NF
44. How to prefix each line of a text file with line number in awk?
45. Display lines starting with non-digital in a text file
46. Display number of rows and number of columns of a CSV file (assuming no empty cell)