CSc 3320: Systems Programming

Spring 2021

Homework

2: Total points 100

Submission instructions:

1. Create a Google doc for each homework assignment submission.
2. Start your responses from page 2 of the document and copy these instructions on page 1.
3. Fill in your name, campus ID and panther # in the fields provided. If this information is missing in your document TWO POINTS WILL BE DEDUCTED per submission.
4. Keep this page 1 intact on all your submissions. If this *submissions instructions* page is missing in your submission TWO POINTS WILL BE DEDUCTED per submission.
5. Each homework will typically have 2-3 PARTS, where each PART focuses on specific topic(s).
6. Start your responses to each PART on a new page.
7. If you are being asked to write code copy the code into a separate txt file and submit that as well.
8. If you are being asked to test code or run specific commands or scripts, provide the evidence of your outputs through a screenshot and copy the same into the document.
9. Upon completion, download a .PDF version of the document and submit the same.

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PART 1 (2.5 points each): 10pts

1. What are the differences among ***grep****, **egrep** and **fgrep***? Describe using an example.
   The differences between them are simply the command for example grep -E is the same thing as egrep as it reads out the pattern as an extension of the original expression and prints out the lines that follow that pattern so for example $egrep Hello newfile.txt will output whatever lines match that hello as for grep then its a wide case scenario and general to find and do those type of things. As for f grep then that is used to find a fixed character string in a file and is used when the file has many special characters, for example, fgrep h.i findsexactly h.i in the fil

2. Which utility can be used to compress and decompress files? And how to compress multiple files into a single file? Please provide one example for it.
   Gzip can be used to compress and decompress files, gzip -c for compress and gzip -d for decompress

3. Which utility (or utilities) can break a line into multiple fields by defining a separator? What is the default separator? How to define a separator manually in the command line? Please provide one example for defining the separator for each utility.
   Csplit can break a line into multiple files determined by context lines, and the default separator is the empty string between non blank and a blank character

4. What does the ***sort*** command do? What are the different possible fields? Explain using an example. Sort commands can sort the contents of your files in specific ways like ascending to

descentding or alphabetical or alphabetical based on a metric like sort new.txt will sort that in alphabetical order.

Part IIa (5 points each): 25pts

5. What is the output of the following sequence of bash commands: **echo 'Hello World' | sed 's/$/!!!/g'**

   Output would be Hello World and whatever matches this sed command because of the pipe in the middle

6. What is the output for each of these awk script commands?

   -- 1 <= NF { print $5 } the output is to print the number of fields in the 5th field
   -- NR >= 1 && NR >= 5 { print $1 }; prints the number of fields bw 1cand 5 in field 1
   -- 1,5 { print $0 }
   -- {print $1 }

7. What is the output of following command line:
   echo good | sed '/Good/d'
   Output good in the output as well as delete the good in the file

8. Which **awk** script outputs all the lines where a plus sign + appears at the end of line?
   Awk

```
{print $1   "+" $NF}
```

9. What is the command to delete only the first 5 lines in a file "foo"? Which command deletes only the last 5 lines?

```
sed -e '1,5d'  foo
Tac file | sed “1,5d” | tac
```

Part IIb (10pts each): 50pts

Describe the function (5pts) and output (5pts) of the following commands.

9. **$ cat float**

Wish I was floating in blue across the sky, my imagination is strong,
And I often visit the days
When everything seemed so clear.
Now I wonder what I'm doing here at all...

$ cat h1.awk

```
NR>2 && NR<4{print NR ":" $0
```

$ awk '/.*ing/ {print NR ":" $1}' float

1:Wish
3:When
4: Now

this command piriints the line number of the and the first word of every sentence that has a ing in it and puts a colon after the line number when we print

10. As the next command following question 9,

$ awk -f h1.awk float

The output would be 3:When everything seemed so clear.
This command prints linebetween the 2 and fourth one which is the the 3rd line first fiedl

11.

$ **cat h2.awk**

```
BEGIN { print    "Start to scan file" }
{print $1      "," $NF}

END {print     "END-" , FILENAME }
```

$ awk -f h2.awk float

Start to scan file
Wish, strong

And,days
When, clear.
Now, all
This command make the .awk file execute on float which prints the first and last worlds on the float file

12. sed 's/\s/\t/g' float

Wherever there is a space, it puts a tab so the out put would be the same as cat float but with big spaces in the middle of each word more like a tab for example

Wish I Was floating

13.

$ ls *.awk| awk '{print "grep --color 'BEGIN' " $1 }' |sh *(Notes: **sh file** runs file as a shell script . $1 should be the output of ‘* ls *.awk ‘ in this case, not the 1st field)*

BEGIN { print “Start to scan file”}

It prints the the things in preatheis in the first line with the word beginning while its colored

14.

$ mkdir test test/test1 test/test2

$cat>test/testt.txt

This is a test file ^D

$ cd test

$ ls -l . | grep '^d' | awk '{print "cp -r " $NF " " $NF ".bak"}' | sh

Part III Programming: 15pts

15. Sort all the files in your class working directory (or your home directory) as per the following requirements:

a. A copy of each file in that folder must be made. Append the string "_copy" to the name of the file

b. The files in each directory must be sorted in chronological order of months.
c. An archive file (.tar) of each directory must be made. The .tar files must be sorted by name in ascending order.
d. An archive file of all the .tar archive files must be made and be available in your home directory.

As an output, show your screen shots for each step or a single screenshot that will cover the outputs from all the steps.