CSC3320 System Level Programming
Lab Assignment 4 - Part 2 (Out of lab)
Instructor: Fil Rondel

Due at 11:59 pm on Friday, Feb. 12 2021

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Purpose: Practices on the grep, fgrep, egrep, sed , awk, and sort commands for text processing.

Note: Please follow the instructions below, and write a report by answering the questions and upload the report (named as Lab4_P2_FirstNameLastName.pdf or .doc) to the Google Classroom Out of Lab Assignment folder

Please add the lab assignment NUMBER and your NAME at the top of your file sheet.

The following table is from Wikipedia. It shows the eleven highest mountains

in Georgia.

Brasstown Bald, (summit),4784,feet,Union County
Rabun Bald, (summit),4696,feet,Rabun County
Dick's Knob, (summit),4620,feet,Rabun County
Hightower Bald, (summit),4568,feet,Towns County
Wolfpen Ridge, (ridge high point),4561,feet,Towns and Union Counties
Blood Mountain, (summit),4458,feet,Union County
Tray Mountain, (summit), 4430,feet,Towns County
Grassy Ridge, (ridge high point),4420,feet,Rabun County
Slaughter Mountain, (summit),4338,feet,Union County
Double Spring Knob, (summit),4280,feet,Rabun County
Coosa Bald, (summit),4280,feet,Union County

In above table, each line contains 5 fields separated by comma. Open your terminal and connect to snowball server. After that, go to directory Lab4 (cd ~/Lab4) and please download the file " mountainList.txt" by the following

command (internet access required):

cp /home/frondel1/Public/mountainList.txt mountainList.txt Be sure it succeeds using "ls" to see the file name "mountainList.txt" listed.

1) Use grep to print all lines where the mountains are at Towns or Union

County.

grep -E "(Union|Towns)" mountainList.txt

Sample Output

```
      Brasstown Bald ,(summit),4784,feet,Union County
            Hightower Bald, (summit),4568,feet,Towns County
Wolfpen Ridge, (ridge high point),4561,feet,Towns and Union Counties
      Blood Mountain, (summit),4458,feet,Union County
Tray Mountain, (summit), 4430,feet,Towns County
Slaughter Mountain, (summit),4338,feet,Union County
Coosa Bald, (summit),4280,feet,Union County
```

2) Use wc and grep to count the number of mountains located at Rabun

County.

grep -o -i "Rabun County" mountainList.txt | wc -l

Hint: please use pipe | .

Sample Output

```
4
```

3) Finish task 2) by using only grep.

Hint: open the manual page of grep, and check -c option.

Grep --help

-c, --count print only a count of matching lines per FILE

4)A. Type command sed ‘s/ridge high point/r.h.p./p’ mountainList.txt and execute it. Then attach a screenshot of the output.

B. Type command sed -n ‘s/ridge high point/r.h.p./p’ mountainList.txt and execute it. Then attach a screenshot of the output.

```
[kguchu1@gsuad.gsu.edu@snowball Lab4]$ sed 's/ridge high point/r.h.p/p mountainList.txt
>
> ^C
[kguchu1@gsuad.gsu.edu@snowball Lab4]$ sed -n 's/ridge high point/r.h.p/p' mountainList.txt
Wolfpen Ridge, (r.h.p),4561,feet,Towns and Union
     Grassy Ridge, (r.h.p),4420,feet,Rabun County
```

C. Open the manual page of sed and describe what does –n do in sed? **-n, --quiet, --silent --- suppress automatic printing of pattern space**

D. Describe what does the sed command in (B) do?

It replaces all the instances of “ridge high point” with “r.h.p”

and prints the changed outputs.

5) Use sed to remove the leading spaces in "mountainList.txt" and print out the processed lines.

sed 's/^ *//' mountainList.txt

6) Finish task 5) and save the output to file "newList.txt".

sed 's/^ *//' mountainList.txt>newList.txt

7) Use sed to list the lines beginning with white spaces in "mountainList.txt". Sample Output

sed -n -e '/^ /p' mountainList.txt

```
    Brasstown Bald, (summit),4784,feet,Union County
        Hightower Bald, (summit),4568,feet,Towns County
    Blood Mountain, (summit),4458,feet,Union County
       Grassy Ridge, (ridge high point),4420,feet,Rabun County
```

8) Use sed to delete the lines where the mountains are only at Union County

in "mountainList.txt".

sed -n '/Union County/!p' mountainList.txt

Sample Output

```
Rabun Bald, (summit),4696,feet,Rabun County
Dick's Knob, (summit),4620,feet,Rabun County
            Hightower Bald, (summit),4568,feet,Towns County
Wolfpen Ridge, (ridge high point),4561,feet,Towns and Union Counties
Tray Mountain, (summit), 4430,feet,Towns County
        Grassy Ridge, (ridge high point),4420,feet,Rabun County
Double Spring Knob, (summit),4280,feet,Rabun County
```

9) Use sed to remove the middle three fields in each line of

"mountainList.txt". Hint: Think about the meaning of regex

'[^,]' sed -r 's/,([^,]*){3},/,/g' public/mountainList.txt

sed 's/,[^,]*,[^,]*,[^,]*,/,/' mountainList.txt

Sample Output

```
      Brasstown Bald,Union County
Rabun Bald,Rabun County
Dick's Knob,Rabun County
            Hightower Bald,Towns County
Wolfpen Ridge,Towns and Union Counties
      Blood Mountain,Union County
Tray Mountain,Towns County
        Grassy Ridge,Rabun County
Slaughter Mountain,Union County
Double Spring Knob,Rabun County
Coosa Bald,Union County
```

10) Use awk to finish task 9).

awk -F',' 'BEGIN{OFS=","}{ print $1,$5}' mountainList.txt

11) Use sed to insert a new line “Table: Eleven highest mountains in Georgia”

at the beginning of "mountainList.txt".

sed '1i Table:Eleven highest mountains in Georgia' mountainList.txt

12) Use sort to print out the sorted lines in alphabetical order according to the names of mountains.

sort +0 -2 mountainList.txt

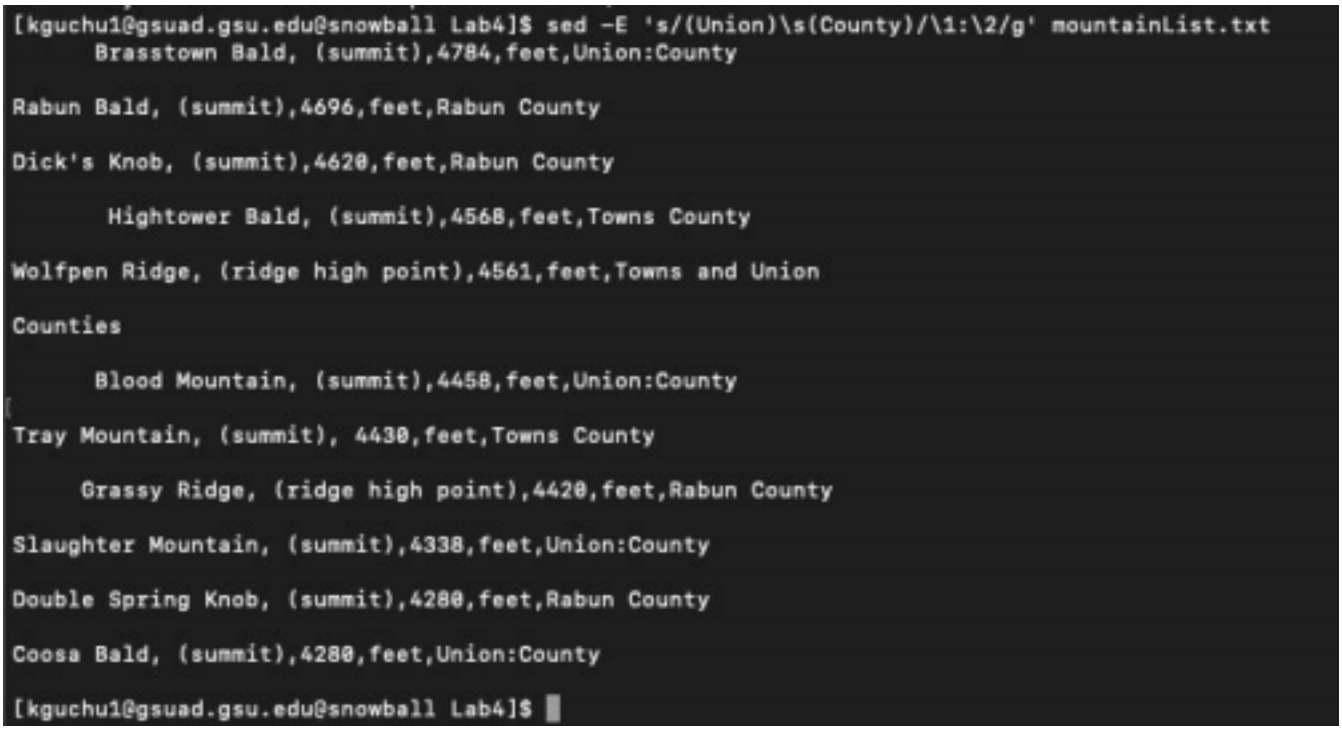
13) Use sort to print out the sorted lines in descending order according to the height of mountains.

sort -t "," -r -nk 3,3 mountainList.txt

14) “When a pattern groups all or part of its content into a pair of parentheses, it captures that content and stores it temporarily in memory. You can reuse that content if you wish by using a back-reference, in the form:\1 or $1, where \1 or $1 reference the first captured group” (Refer to [1]). For example, the following command add a colon between Union and County

sed -E ‘s/(Union)\s(County)/\1:\2/g’ mountainList.txt

Attach a screenshot of the output of the above sed command.



15) Now can you write a command to finish task 9) using sed with back reference?

sed -E 's/,.*,/,/' mountainList.txt

Useful Links:

[1] Introducing Regular Expression - Capturing Groups and Back references https://www.safaribooksonline.com/library/view/introducing regular-expressions/9781449338879/ch04.html

[2] Drew's grep tutorial
http://www.uccs.edu/~ahitchco/grep/

[3] Grep and Regular Expressions!

http://ryanstutorials.net/linuxtutorial/grep.php

[4] Web Scraping with Regular Expressions

https://www.datascraping.co/doc/22/regular-expression