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Sep 23 2021
CRN 88089
Lab 4 Part 2 Commands Report

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

Due at 11:59 pm on Wednesday, Sep. 22, 2021

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/bbello1/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.

egrep ‘Towns|Union’ mountainList.txt

```
[vdo10@gsuad.gsu.edu@snowball Lab4]$ egrep 'Towns|Union' mountainList.txt
    Brasstown Bald, (summit),4784,feet,Union County
               Hightower Bald, (summit),4568,feet,Towns County
Wolfpen Ridge, (ridge high point),4561,feet,Towns and Union
        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
[vdo10@gsuad.gsu.edu@snowball Lab4]$
```

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. Hint: please use pipe | .

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

```
[vdo10@gsuad.gsu.edu@snowball Lab4]$ grep -o -i 'Rabun County' mountainList.txt|wc -l
4
[vdo10@gsuad.gsu.edu@snowball Lab4]$
```

Sample Output

```
4
```

3) Finish task 2) by using only grep.
Hint: open the manual page of grep, and check -c option.

grep -c ‘Rabun County’ mountainList.txt

```
[vdo10@gsuad.gsu.edu@snowball Lab4]$ grep -c 'Rabun County' mountainList.txt
4
[vdo10@gsuad.gsu.edu@snowball Lab4]$
```

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.

```
[vdo10@gsuad.gsu.edu@snowball Lab4]$ sed 's/ridge high point/r.h.p./p' mountainList.txt
    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, (r.h.p.),4561,feet,Towns and Union
Wolfpen Ridge, (r.h.p.),4561,feet,Towns and Union
Counties
       Blood Mountain, (summit),4458,feet,Union County
Tray Mountain, (summit), 4430,feet,Towns County
       Grassy Ridge, (r.h.p.),4420,feet,Rabun County
       Grassy Ridge, (r.h.p.),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
[vdo10@gsuad.gsu.edu@snowball Lab4]$
```

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.

```
[vdo10@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
[vdo10@gsuad.gsu.edu@snowball Lab4]$
```

C. Open the manual page of sed and describe what does –n do in sed?

-n: suppresses the automatic printing of the pattern

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

sed command replaces the output lines containing the text “ridge high point” with “r.h.p” without printing the pattern space.

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

sed -e ‘s/^\[\t]*//’ mountainList.txt

```
[vdo10@gsuad.gsu.edu@snowball Lab4]$ sed -e 's/^\[\t]*//' mountainList.txt
    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
[vdo10@gsuad.gsu.edu@snowball Lab4]$
```

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

sed -e ‘s/^\[\t]*//’ mountainList.txt > newList.txt

```
[vdo10@gsuad.gsu.edu@snowball Lab4]$ sed -e 's/^\[\t]*//' mountainList.txt > newList.txt
[vdo10@gsuad.gsu.edu@snowball Lab4]$ ls
mountainList.txt  newList.txt  temp_course.txt
[vdo10@gsuad.gsu.edu@snowball Lab4]$
```

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

sed -n ‘/^ /p’ mountainList.txt

```
[vdo10@gsuad.gsu.edu@snowball Lab4]$ sed -n '/^ /p' mountainList.txt
    Brasstown Bald, (summit),4784,feet,Union County
        Blood Mountain, (summit),4458,feet,Union County
[vdo10@gsuad.gsu.edu@snowball Lab4]$
```

Sample Output

```
    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

```
[vdo10@gsuad.gsu.edu@snowball Lab4]$ sed -n '/Union County/!p' mountainList.txt
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
[vdo10@gsuad.gsu.edu@snowball Lab4]$
```

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 -r 's/,[^,]*,[^,]*,[^,]*,/,/g' mountainList.txt

```
[vdo10@gsuad.gsu.edu@snowball Lab4]$ sed -r 's/,[^,]*,[^,]*,[^,]*,/,/g' mountainList.txt
    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
[vdo10@gsuad.gsu.edu@snowball Lab4]$
```

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

```
[vdo10@gsuad.gsu.edu@snowball Lab4]$ awk -F ',' 'BEGIN{OFS=","}{ print $1,$5}' mountainList.txt
    Brasstown Bald,Union County
Rabun Bald,Rabun County
Dick's Knob,Rabun County
               Hightower Bald,Towns County
Wolfpen Ridge,Towns and Union
Counties,
        Blood Mountain,Union County
Tray Mountain,Towns County
        Grassy Ridge,Rabun County
Slaughter Mountain,Union County
Double Spring Knob,Rabun County
Coosa Bald,Union County
[vdo10@gsuad.gsu.edu@snowball Lab4]$
```

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

```
[vdo10@gsuad.gsu.edu@snowball Lab4]$ sed '1i Table: Eleven highest mountains in Georgia' mountainList.txt
Table: 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
[vdo10@gsuad.gsu.edu@snowball Lab4]$
```

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

sort -t "," -k 1,1 mountainList.txt

```
[vdo10@gsuad.gsu.edu@snowball Lab4]$ sort -t "," -k 1,1 mountainList.txt
       Blood Mountain, (summit),4458,feet,Union County
    Brasstown Bald, (summit),4784,feet,Union County
Coosa Bald, (summit),4280,feet,Union County
Counties
Dick's Knob, (summit),4620,feet,Rabun County
Double Spring Knob, (summit),4280,feet,Rabun County
       Grassy Ridge, (ridge high point),4420,feet,Rabun County
              Hightower Bald, (summit),4568,feet,Towns County
Rabun Bald, (summit),4696,feet,Rabun County
Slaughter Mountain, (summit),4338,feet,Union County
Tray Mountain, (summit), 4430,feet,Towns County
Wolfpen Ridge, (ridge high point),4561,feet,Towns and Union
[vdo10@gsuad.gsu.edu@snowball Lab4]$
```

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

```
[vdo10@gsuad.gsu.edu@snowball Lab4]$ sort -t "," -r -nk 3,3 mountainList.txt
    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
       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
Counties
[vdo10@gsuad.gsu.edu@snowball Lab4]$
```

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.

```
[vdo10@gsuad.gsu.edu@snowball Lab4]$ sed -E 's/(Union)\s(County)/\1:\2/g' mountainList.txt
    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
[vdo10@gsuad.gsu.edu@snowball Lab4]$
```

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

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

```
[vdo10@gsuad.gsu.edu@snowball Lab4]$ sed -E 's/,.*,/,/' mountainList.txt
    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
[vdo10@gsuad.gsu.edu@snowball Lab4]$
```

Useful Links:

[1] Introducing Regular Expression - Capturing Groups and Backreferences

https://www.safaribooksonline.com/library/view/introducingregular 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