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.

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.

grep ‘Town\|Union’ 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. Hint: please use

pipe | .

grep ‘Rabun’ mountainList.txt | wc -l

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’ mountainList.txt

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.

```
-bash-4.2$ 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
-bash-4.2$
```

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.

```
-bash-4.2$ 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
-bash-4.2$
```

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

The -n in the sed prints only the liens that were mentioned using p will be printed once during the printing. If not it will be printed twice in the automatic printing.

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

The sed command in (B) prints two different results using or

with automatic printing.

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

```
sed ‘s/^[ \t]*//;s/[ \t]*$//’ mountainList.txt
```

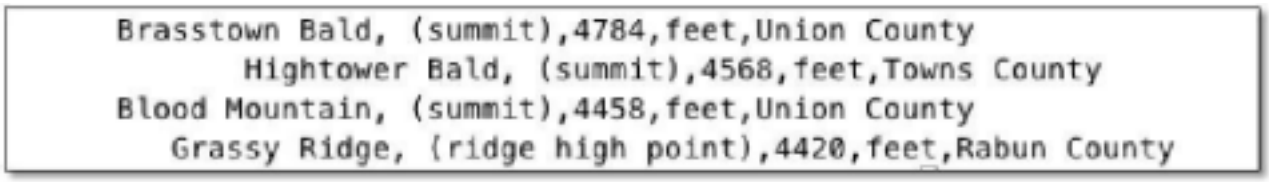
6) Finish task 5) and save the output to file "newList.txt".

```
cat mountainList.txt | sed ‘s/^[ \t]*//;s/[ \t]*$//’ mountainList.txt > newList.txt
```

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

```
sed -n ‘/^[[:space:]]/p’ mountainList.txt
```

Sample Output



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

in "mountainList.txt".

```
sed ‘/Union County/d’ 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/,.*,/,/g’ 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 ‘{print $1,$NF}’ FS=, OFS=, mountainList.txt

11) Use sed to insert a new line “Table: Eleven highest mountains in Georgia” at the beginning of "mountainList.txt".

sed ‘1s/^/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.

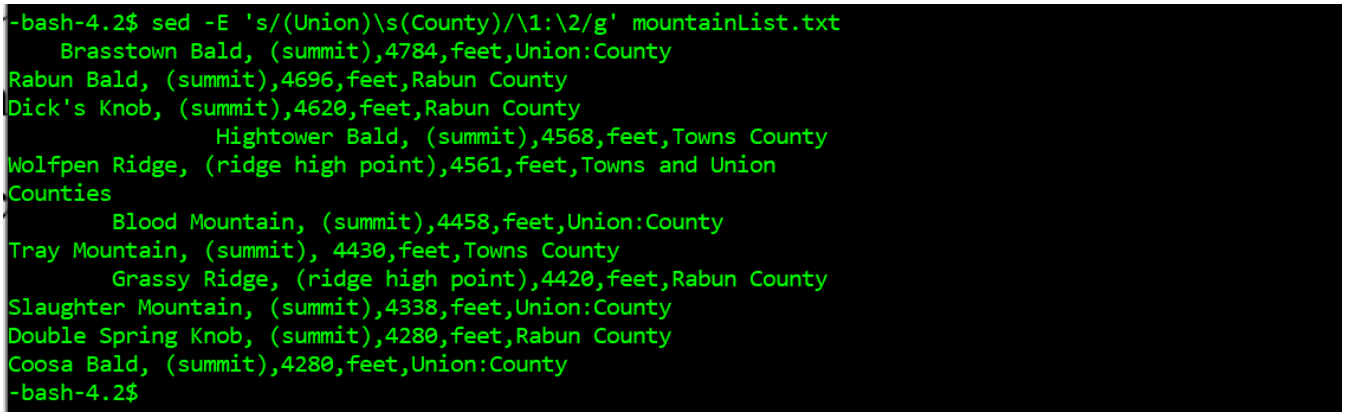
sort -t’.’ -k2 mountainList.txt

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 backreference?

sed -E ‘s/,.*/,/’ mountainList.txt

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