System Admin Course - IIT Madras Online BSc

Week 4

Problem 1

Consider a file named `lsinfo.txt` in your current working directory that contains output of the command `ls -al` run on some directory.

1. Use grep/egrep to print all the files/directories in file `lsinfo.txt` such that for those files/directories:
    1. User has read and write permission only.
    2. The group to which user belongs to has read permission only
    3. Other users have read permission only

Answer

```
grep "^.rw-r--r--" lsinfo.txt
```

2. Use grep/egrep to print the long-listing of all files excluding directories in `lsinfo.txt` whose last modified date is in January.

Note: There are many special kind of files in linux for example for socket files the first character in permission string is 's' like it is 'd' for directories.

Answer

```
egrep '^[^d].* Jan' lsinfo.txt
# Another Solution
# egrep -v '^d' lsinfo.txt | grep 'Jan'

# Another Solution if you want to search only normal files.
# grep "^-.* Jan " lsinfo.txt
```

Problem 2

The command below gives the following output.

```
$ cat twocities.txt
It was the best of times, it was the worst of times,
it was the age of wisdom, it was the age of foolishness,
It was the epoch of belief, It was the epoch of incredulity,
it was the season of Light, it was the season of Darkness,
it was the spring of hope, it was the winter of despair,
we had everything before us, we had nothing before us,
We were all going direct to Heaven, it was all bright
```

1. Write a command to count the number of lines that starts with a capital letter and contains the word `it` (case-sensitive) in the above file.

(a) Try a solution with only grep command.

(b) Try a solution usign grep and wc commands.

Answer

```
# Solution using only grep
$ grep -c '^[[:upper:]].*it' twocities.txt
# Solution involving wc
$ grep '^[[:upper:]].*it' twocities.txt | wc -l
```

2. Write a command to display all the lines that does not contain the word "we" in it.

Answer

`$ grep -v "we" twocities.txt`

3. Write a command using grep to display all the lines that end with the letter `s`, in the above file

Answer

`$ grep -v "s,$" twocities.txt`

Problem 3

The file `file.txt` contains three fields in a line in the order

- Country
- Capital
- Continent

The first two fiels country and capital are separated by a comma and the last two fields capital and continent are separated by a semicolon.

The command below prints the file.

```
$ cat file.txt
India, New Delhi; Asia
Czech Republic, Prague; Europe
South Korea, Seoul; Asia
Uzbekistan, Tashkent; Asia
Mozambique, Maputo; Africa
United Arab Emirates, Abu Dhabi; Asia
Papua New Guinea, Port Moresby; Oceania
Estonia, Tallinn; Europe
Trinidad and Tobago, Port of Spain; South America
Ghana, Accra; Africa
```

1. Write a command using cut to display only the countries and its capitals in the `file.txt` in the format `Country, Capital` (Eg. `India, New Delhi`) on each line.

Answer

```
$ cut -d ";" -f 1 file.txt
```

2. Print all the country capitals in the file `file.txt` sorted alphabetically by name in reverse order.
   (Hint: Use the command `sort -r` to sort in reverse order)

Answer

```
$ cat file.txt | cut -d ',' -f 2 | cut -d ';' -f 1 | sort -r
```

3. Use the cut command to extract the first 5 continent names in the file `file.txt` and store it in another file named `continent.txt`

Answer

```
$ cat file.txt | head -n 5 | cut -d ';' -f 2 > continent.txt
```

Problem 4

Write the command to list the names of all the c++ files (i.e. with the extension `.cpp`) in the current directory which contains a line such that

- The line starts with the string `void main()` and ends with the character `{`. There should be one or more spaces/tabs between the characters `{` and `)`, but nothing except spaces.
  - For e.g the lines `void main(){`, `void main() {}` are not a match for the above condition, but the lines `void main() {`, `void main()  {` are a match.

Answer

```
grep -l 'void main()[[:blank:]][[:blank:]]*{$' *.cpp

# Alternativly if you want to use egrep, you will have to escape parantheses but
you can use +
# egrep -l 'void main\(\)[[:blank:]]+{$' *.cpp
```

4(b)

Also print the count of these files in the following line. (Note: Try `tee /dev/tty` to the purpose)

Answer

```
egrep -l 'void main\(\)[[:blank:]]+{$' *.cpp | tee /dev/tty | wc -l
```

Problem 5

Write the command to list all the packages installed on your machine and their versions in the format `Package Version` in a sorted manner. (Each line has only one package and its version)
(Hint: Use dpkg)

This is homework, try this on your local machine, this will not work on replit.

Answer

```
$ dpkg-query -W -f='${binary:Package} ${Version}\n' | sort
```