Assignment 4 Answers

Assignment 4

CS 140U online 50 POINTS

DUE: Announced in Discussion board and online calendar on D2L

Use your text editor and copy and paste the questions and answers and submit them in the Dropbox. Make sure that you only attach a text file.

If you are asked to show your session, it means that you need to be logged in the unix system. Either use the copy and paste feature of the contents that you see on the screen or use the **Logging** feature found on putty. Remove the non necessary extra text and only show the command and output used to answer the questions (look at the option logging in putty, select the option **Printable output**)

If the files do not exist, please create dummy ones.

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Question: 1
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Create this sample file, you can call it student grades:

John Doe 3.54 ECE
James Davis 3.71 ECE
Al Davis 2.63 CS
Ahmad Rashid 3.74 MBA
Sam Chu 3.68 ECE
Arun Roy 3.06 SS
Rick Marsh 2.34 CS
James Adam 2.77 CS
Art Pohm 4.00 ECE
John Clark 2.68 ECE
Nabeel Ali 3.56 EE
Tom Nelson 3.81 ECE
Pat King 2.77 SS
Jake Zulu 3.00 CS
John Lee 2.64 EE
Sunil Raj 3.36 ECE
Charles Right 3.31 EECS
Diane Rover 3.87 ECE
Aziz Inan 3.75 EECS
Lu John 3.06 CS
Lee Chow 3.74 EE

Adam Giles 2.54 SS
Andy John 3.98 EECS

The file above contains student records. Use a command line to display the records for the top five students in descending (sorted) order, i.e., with the highest GPA student's record displayed first. Show your session.

---------- Answer ----------
> sort -r -k 3 student.grades | awk 'FNR <= 5'
Art Pohm 4.00 ECE
Andy John 3.98 EECS
Diane Rover 3.87 ECE
Tom Nelson 3.81 ECE
Aziz Inan 3.75 EECS

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Question: 2
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Create sample files lab1, lab2, lab3 and lab4. They can be created using vi, or doing something like who > lab1, etc. Once you have created the file, display its content with the cat command. Show your session.

Combine the lab files: lab1, lab2, lab3, and lab4 appending them >> to a file called all.labs . Any errors (pretend one of those lab files do not exist) should be redirected to an error.log file. Since you will have all the files, once you redirect the error 2>, assume that you do not have one of the files that consequently would generate an error, in this case the error.log file will be empty, but to build the command include the 2> as if one of the files did not exist. This whole command will be in one line. Show your session.

Show your session.
---------- Answer ----------
> echo "Sample contents for lab1 file" > lab1
> echo "Sample contents for lab2 file" > lab2
> echo "Sample contents for lab3 file" > lab3
> echo "Sample contents for lab4 file" > lab4
> cat lab1
Sample contents for lab1 file
> cat lab2
Sample contents for lab2 file
> cat lab3
Sample contents for lab3 file
> cat lab4
Sample contents for lab4 file

> cat lab1 lab2 lab3 lab4 2> error.log >> all.labs
> cat error.log
> cat all.labs
Sample contents for lab1 file
Sample contents for lab2 file

Sample contents for lab3 file
Sample contents for lab4 file

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Question: 3

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How many soft links are there in the /usr directory.

Show the command and its output.

---------- Answer ----------

There are a total of 1 softlinks in /usr on syccuxas01.pcc.edu. This was achieved by listing the long and all contents
of the /usr directory and then piping those results into awk for filtering
out all lines with an -> contained within them.

We could manually count the lines from the displayed output, however, we can also pipe these lines into other commands to perform this counting for us. I chose two methods of doing this, simply to illustrate how wonderful Linux is by supporting many different approaches/solutions to a problem.

The first pipes the results of the awk search for the -> entries into another awk session, which simply waits to the end and prints the last Number Record (NR) as the only output.

Similarly, the second version simply pipes the results of the awk search into the wc command with the option of just asking for the number of lines:

```
> date;ls -la /usr
Thu Apr 28 10:56:24 PDT 2016
total 288
drwxr-xr-x 15 root root 4096 Dec 30 14:24 .
drwxr-xr-x 23 root root 4096 Sep 22 2015 ..
drwxr-xr-x 5 root root 4096 Nov 6 2013 X11R6
drwxr-xr-x 8 root root 69632 Apr 18 13:48 bin
drwxr-xr-x 2 root root 4096 Sep 27 2013 games
drwxr-xr-x 91 root root 12288 Mar 4 11:11 include
drwxr-xr-x 8 root root 4096 Sep 17 2014 jdk
drwxr-xr-x 106 root root 24576 Apr 18 14:18 lib
drwxr-xr-x 164 root root 106496 Apr 18 14:18 lib64
drwx------ 3 root root 4096 Dec 30 14:24 libexec
drwxr-xr-x 12 root root 4096 Aug 29 2015 local
drwxr-xr-x 2 root root 20480 Dec 31 16:54 sbin
drwxr-xr-x 295 root root 12288 Dec 30 14:23 share
drwxr-xr-x 9 root root 4096 Apr 18 14:18 src
lrwxrwxrwx 1 root root 10 Nov 6 2013 tmp -> ../var/tmp
drwxr-xr-x 5 root root 4096 Nov 6 2013 x86_64-suse-linux
> ls -la /usr | awk '/->/ {print}' | awk 'END {print "Number of Soft-Links: " NR}'
Number of Soft-Links: 1
> date; ls -la /usr | awk '/->/ {print}' | echo "Number of Soft-Links: " `wc -l`
Thu Apr 28 10:56:35 PDT 2016
Number of Soft-Links: 1
```

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Create a file named students containing the following data in your current directory. Each line in this file represents a student's first name, last name, and 3 exam scores. Each line should be regarded as a record containing 5 fields separated by one or more tab characters.

You MUST use the awk command to answer these questions (4-6)

Tom Jones 100 90 80
Nancy Jones 70 80 90
Terry Sims 55 65 75
John Terry 75 76 77
Ruth Maier 100 100 100
Mike Wolfe 90 95 98
Dennis Cole 70 80 89
Ron Maier 90 85 89
Susan Miller 65 80 90
Mad Bill 75 65 77

Some help with awk
http://cdn.ttgtmedia.com/searchEnterpriseLinux/downloads/Sobell_ch12.pdf

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Question: 4

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Use AWK. What command line would display the contents of students file such that first names and last names are swapped?

---------- Answer ----------

```
> awk '{print $2,$1,$3,$4,$5}' students
Jones Tom 100 90 80
Jones Nancy 70 80 90
Sims Terry 55 65 75
Terry John 75 76 77
Maier Ruth 100 100 100
Wolfe Mike 90 95 98
Cole Dennis 70 80 89
Maier Ron 90 85 89
Miller Susan 65 80 90
Bill Mad 75 65 77
```

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Question: 5

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Use AWK. What command line would display the first and last names of those who got 100 on their first exam (there are examples in the book)?

---------- Answer ----------

```
> awk '$3==100 {print}' students
```

Tom Jones 100 90 80
Ruth Maier 100 100 100

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Question: 6

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Use AWK. What command line would display the contents of the students file with line numbers in front of each line?

---------- Answer ----------

> awk '{print NR,$0}' students
1 Tom Jones 100 90 80
2 Nancy Jones 70 80 90
3 Terry Sims 55 65 75
4 John Terry 75 76 77
5 Ruth Maier 100 100 100
6 Mike Wolfe 90 95 98
7 Dennis Cole 70 80 89
8 Ron Maier 90 85 89
9 Susan Miller 65 80 90
10 Mad Bill 75 65 77
