Computer Systems Bash Test Preparation

Curtin University

School of EECMS

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#/bin/bash

The main areas to focus for bash test are: grep, awk, and sed. However other commands such as for or while loop maybe used to perform tasks with grep, awk, and sed.
Also, study laboratory 6 part 1& 2.

According to Linux man page:

GREP:
"grep searches for *PATTERNS* in each *FILE*. *PATTERNS* is one or patterns separated by newline characters, and **grep** prints each line that matches a pattern."
Main usage: Print lines matching a pattern

AWK:
"Gawk is the GNU Project's implementation of the AWK programming language. It conforms to the definition of the language in the POSIX 1003.1 Standard. This version in turn is based on the description in The AWK Programming Language, by Aho, Kernighan, and Wein- berger. Gawk provides the additional features found in the current version of Brian Kernighan's awk and a number of GNU-specific extensions."
Main usage: pattern scanning and processing language

SED
"Sed is a stream editor. A stream editor is used to perform basic text transformations on an input stream (a file or input from a pipeline). While in some ways similar to an editor which permits scripted edits (such as *ed*), *sed* works by making only one pass over the input(s), and is consequently more efficient. But it is *sed*'s ability to filter text in a pipeline which particularly distinguishes it from other types of editors."
Main usage: stream editor for filtering and transforming text

For more information use *man grep*, *man awk*, and *man sed* on the linux machine command line.
cs@cs:/$man grep
cs@cs:/$man awk
cs@cs:/$man sed

Sample questions:

1. The auth.log file under /var/log/ tracks the usage of authorization system. Write a script to:
    a) Copy the current content of the file into auth.txt
    b) In auth.txt change all entry "cs" to "admin"
    c) Delete all the lines that does not include "sudo"
    d) Display the last hour entry in auth.txt

ANS: (this a very simple answer you can add date and time calculation)
Create a .sh file and save the following code, change the permission (chmod +x filename), and run the file ./filename. You might need to run this in superuser mode (sudo su)

```
 #!/bin/bash
cp auth.log output.log
sed -e 's/cs/admin/g' output.log > example.txt
awk '{
        if ( $5 = "sudo:"){
        print $0;}
        }' example.txt > output.txt
cp output.txt example.txt
grep "Oct 25 9:" example.txt
```

2. Print a table of ASCII characters between 35 to 120.

ANS:
Create a .sh file and save the following code, change the permission (chmod +x filename), and run the file ./filename.

```
#!/bin/bash
# pr-ascii.sh: Prints a table of ASCII characters.

START=35   # Range of printable ASCII characters (decimal).
END=120

echo " Decimal   Hex     Character"   # Header.
echo " -------   ---     ---------"

for ((i=START; i<=END; i++))
do
  echo $i | awk '{printf("  %3d       %2x         %c\n", $1, $1, $1)}'
# The Bash printf builtin will not work in this context:
#     printf "%c" "$i"
done

exit 0
```

3. Write a script to display the total size of all log files in /var/log

ANS:

```
cs@cs$ ls -l | awk 'BEGIN {sum=0} {sum=sum+$5} END {print sum}'
```

4. Display the 3rd line of the output from “ls -l” command in /var/log

ANS:

```
cs@cs$ ls -l | awk '{for (i=1;i<3;i++) {getline}; print NR,$0}'
```