

Solution

Q.2 a. What is a pager? Name the two standard pagers used by *man*. (4)

Answer:

A program that displays text on the screen a page at a time. *more* and *less* are two standard pagers used by *man*.

b. What is difference between an argument and an option? Explain with example. (4)

Answer:

An option is also an argument but generally begins with a hyphen.

e.g. `ls -l note`

`-l` is an argument to `ls` by definition, but more importantly, its a special argument known as option.

c. How will you select from a file (i) lines 3 to 10 (ii) all but the last line. (4)

Answer:

(i) `sed -n '3, 10p' filename`

(ii) `sed -n '$!p' filename`

d. What are pipes in Unix? Give one example. (4)

Answer:

Using a UNIX shell, a pipe is specified in a command line as a simple vertical bar (`|`) between two command sequences. The output or result of the first command sequence is used as the input to the second command sequence.

Here's an example where I count the characters, words, and lines of the `apple.txt` file, then mail the results to `nobody@december.com` with the subject line "The count."

```
$ cat apple.txt | wc | mail -s "The count" nobody@december.com
```

Q.3 a. What attributes of files are displayed when we execute `ls -l` command? Briefly explain about each. (8)

Answer:

(a) `ls -l` list seven attributes of all files in the current directory namely: file types and permissions, number of hard links associated with files, ownership, group ownership, file size, last-modified date and filename.

E.g.

```

$ ls -l
total 4
drwxr-xr-x  2  user  user  80  2011-08-17  16:52  Desktop
drwxr-xr-x  2  user  user  40  2011-08-17  16:52  Documents
drwxr-xr-x  2  user  user  40  2011-08-17  16:52  Downloads
drwxr-xr-x  2  user  user  40  2011-08-17  16:52  Music
drwxr-xr-x  2  user  user 120  2011-08-17  18:14P ictures
$

```

b. How do you substitute for a pattern in vi editor? Explain with example. (4+4)

Answer:

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Q.4 a. You want to concatenate two files, *abc* and *xyz*, but also insert some text after *abc* and before *xyz* from the terminal. How will you do this? (4)

Answer:

cat abc - xyz > newfile

b. What are three distinct phases in the creation of a process? Explain it. (2×3)

Answer:

The three distinct phases in the creation of a process are:

- 1) Fork - A copy of the process that invokes it is created.
- 2) Exec - The parent then overwrites the copy to create the child.
- 3) Wait - The parent waits for the death of the child.

c. What do these commands do? (i) grep a b c (ii) grep <HTML> foo (3+3)

Answer:

(i) grep searches for a in file b and c. (ii) The command does not work because <HTML> is not quoted, and the shell interprets the <and> symbol as the redirection characters.

Q.5 a. What is 'grep' filter? Explain with example. (3+3)

Answer:

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b. How do you locate lines containing these patterns? (6)
 (i) saxena or saksena (ii) rajiv, rajeeb or Rajeev
 (iii) SIGSTOP or SIGTSTP

Answer:

(1) sa[kx]s?ena (2) raj[ei]e?[vb] (3) SIG(STOP|TSTP)

- c. Write awk command to locate lines longer than 100 and smaller than 150 characters in a file. (4)

Answer:

awk 'length > 100 && length < 150 filename'

- Q.6 a. If `rmdir c_progs` fails, what could be the possible reasons? (4)**

Answer:

The directory `c_progs` is not empty or the command is executed in the directory itself.

- b. How will you copy a directory structure `bar1` to `bar2`? Does it make any difference if `bar2` exists? (4)

Answer:

Use `cp -r bar1 bar2`. If `bar2` exists, then `bar1` becomes a subdirectory of `bar2`.

- c. Write a shell script to check whether a given number is prime or not. (8)

Answer:

```
echo "Enter a number: "
read num
i=2
f=0
while [ $i -le `expr $num / 2` ]
do
if [ `expr $num % $i` -eq 0 ]
then
f=1
fi
i=`expr $i + 1`
done
if [ $f -eq 1 ]
then
echo "The number is composite"
else
echo "The number is Prime"
fi
```

- Q.7 a. How is `chown` different from `chgrp` when it comes to renouncing ownership? (4)**

Answer:

On a BSD based system, only the superuser can use **chown** to change the owner of a file.

However, a user can change her own group with **chgrp** but only to one to which she also belongs.

- b. Name three ways how to exit from a vi session after saving your work. (4)**

Answer:

The three ways of exiting a vi session after saving the work are: (1) :x (2) :wq (3) ZZ

- c. Explain the principal components: Kernel and Shell, of the UNIX operating system. (8)**

Answer:

Kernel: The kernel of Unix is the heart of the operating system. It allocates time and memory to programs and handles the file structure and communication between the different parts of the computer system such as the keyboard and the screen.

Shell: The shell is an interface between the user and the Unix kernel. It resembles the 'dos box' that Windows displays if you run the command cmd. When a user logs in, Unix checks their username and password and then starts a program called the shell. The shell interprets the commands the user types and transmits them to the kernel to be executed. These commands are programs

- Q.8 a. You repeatedly have to toggle between /user/include and /user/lib. How do you use a shortcut to do that repeatedly? (4)**

Answer:

first use **cd /user/include**, then **cd ../lib**. Now, every time you use **cd -**, the current directory toggle between the two.

- b. Write a shell program to count number of words, characters, white spaces and special symbols of a given text. (12)**

Answer:

```
echo Enter a text

read text
w=`echo $text | wc -w`
w=`expr $w`
c=`echo $text | wc -c`
c=`expr $c - 1`
s=0
alpha=0
j=` `
n=1
while [$n -le $c ]
do
ch=`echo $text | cut -c $n`
if test $ch = $j
then
s=`expr $s + 1`
fi
```

```

case $ch in
a|b|c|d|e|f|g|h|i|j|k|l|m|n|o|p|q|r|s|t|u|v|w|x|y|z) alpha=`expr $alpha + 1`;;
esac
n=`expr $n + 1`
done
special=`expr $c - $s - $alpha`
echo Words=$w
echo Characters=$c
echo Spaces=$s
echo Special symbols=$special

```

- Q.9 a. Write perl script to ask from user repeatedly to enter a number, and when the user enters 0, print the total of all numbers entered so far. (8)**

Answer:

```

#!/user/bin/perl
$number = 1;
while ($number != 0)
{
    print("enter a number:");
    $number = <STDIN>;
    chop($number);
    if ($number != 0)
    { $total += $number;
    }
}
print "the total is $total\n";

```

- b. Write perl script that prompts a user to input a string and a number, and prints the string that many times, with each string on a separate line. (8)**

Answer:

```

#!/user/bin/perl

print "String";
$a = <STDIN>;
print "Number of times";
chop ($b=<STDIN>);
$c = $a x $b;
print "The result is :\n$c";

```

TEXT BOOK

UNIX Concepts and Applications, 4th Edition, Sumitabha Das, Tata
McGraw Hill, 2008