Capgemini

UNIX

Filters

Lesson Objectives

In this lesson, you will learn:

- Filter commands in UNIX:
  - Simple Filters
  - Advance Filters

What is a Filter?

Filters are central tools of the UNIX tool kit.

Commands work as follows:

- Accept some data as input.
- Perform some manipulation on the inputted data.
- Produce some output.

Most of them work on set of records, with each field of a record delimited by a suitable delimiter.

When used in combination, they can perform complex tasks too.

head Command

The head command, by default, will display the first 10 lines of a file.

- **Example 1:** To display fist 10 lines from file employee:

```
$head employee
```

- **Example 2:** To display first 5 lines from file employee:

```
$head –5 employee
```

Single command can be used to display lines from more than one file.

```
$ head -1 PuneEmp PKPEmp
```

tail Command

The tail command is useful to display last few lines or characters of the file.

- **Example 1:** To display last ten lines from employee:

```
$tail employee
```

- **Example 2:** To display last seven lines:

```
$tail –7 employee
```

```
$tail +10 employee
```

- **Example 4:** To display last 5 characters of the file:

```
$tail -5c employee
```

cut Command

The cut command retrieves selected fields from a file.

```
$ cut [options] <filename>
```

- Options :
  - -c : selects columns specified by list
  - -f : selects fields specified by list
  - -d : field delimiter (default is tab)

cut Command

- **Example 1:** To display 2nd and 3rd field from file bookDetails.lst:

```
$ cut -d"|" -f2,3 bookDetails.lst
```

- **Example 2:** To display characters from 1st to 4th and 31st to 35th from file bookDetails.lst :

```
$ cut -c1-4,31-35 bookDetails.lst
```

paste Command

The paste command is used for horizontal merging of files.

```
$paste <file1><file2><Enter>
```

- Options : -d (Field delimiter)
- **Example 1:** To paste enum.lst and ename.lst files:

```
$ paste enum.lst ename.lst
```

- **Example 2:** To paste enum.lst and ename.lst files with '|' character as delimiter:

```
$ paste –d'|' enum.lst ename.lst
```

sort Command

The sort command is useful to sort file in ascending order.

```
$sort <filename>
```

- Options are:
  - -r : Reverse order
  - -n : Numeric sort
  - -f : Omit the difference between Upper and lower case alphabets
  - -t : Specify delimiter
  - -k : to specify fields as primary or secondary key
- Example:

```
$ sort -t"|" +1 bookDetails.lst
$sort –k3,3 -k2,2 employee
```

uniq Command

The uniq command fetches only one copy of redundant records and writes the same to standard output.

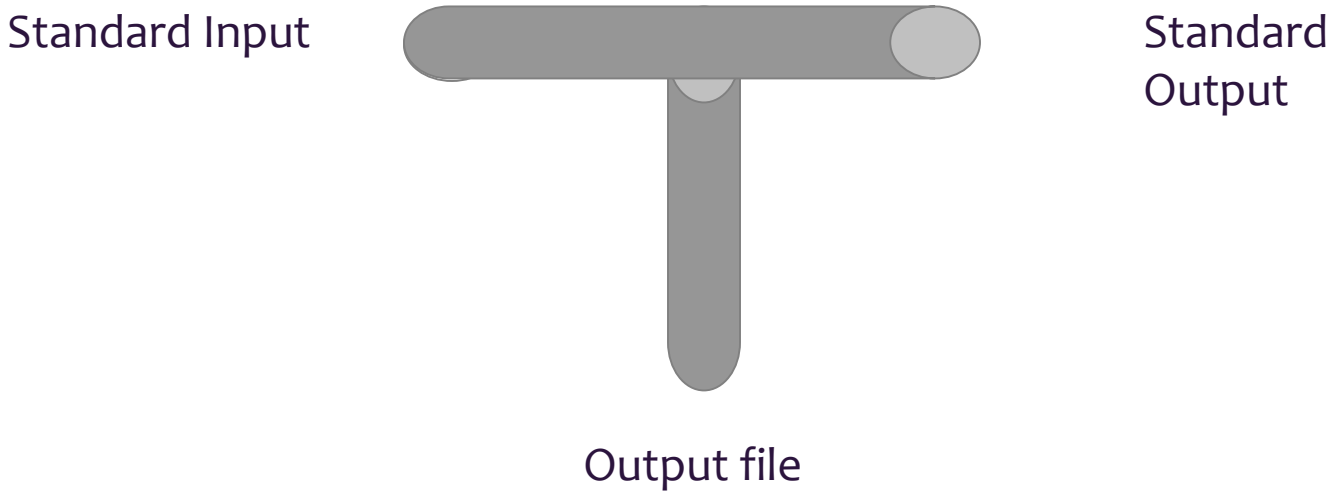
- –u option: It selects only non-repeated lines.
- –d option: It selects only one copy of repeated line.
- -c option: It gives a count of occurrences.

To find unique values, the file has to be sorted on that field.

- **Example:** To find unique values from file duplist.lst

```
$ uniq duplist.lst
```

tee Command



- To display contents of file employee on screen as well as save it in the file:

```
$ tee user.txt < employee
```

find Command

The find command locates files.

```
find <path list>  <selection criteria> <action>
```

- **Example 1:** To locate the file named **.profile** starting at the root directory in the system **-print** specify the action:

```
$ find / -name .profile –print
```

- **Example 2:** To locate the file named myfile starting at the root directory in the system

```
find / -type f -name "myfile" -print
```

grep Command

The syntax for grep command is as follows:

```
grep <options> <pattern> <filename(s)>
```

- **Example:** The following example will search for the string Unix in the file **books.lst**. The lines which match the pattern will be displayed.

```
grep 'Unix' books.lst
```

grep Command

Options of grep:

- c : It displays count of lines which match the pattern.
- n : It displays lines with the number of the line in the text file which match the pattern.
- v : It displays all lines which do not match pattern.
- i : It ignores case while matching pattern.
- -w : It forces grep to select only those lines containing matches that form whole words

grep Command

- **Example 1:** To print all lines containing “rose” regardless of case:

```
$grep -i rose flower.txt
```

- **Example 2:** To print all lines containing “rose” as a word:

```
$grep -w rose flower.txt
```

- **Example 3:** To print all lines not containing “rose”:

```
$grep -v rose flower.txt
```

grep Command

Regular Expression:

Expression	Description
^ (Caret)	match expression at the start of a line, as in ^A.
$ (Question)	match expression at the end of a line, as in A$.
\ (Back Slash)	turn off the special meaning of the next character, as in \^.
[ ] (Brackets)	match any one of the enclosed characters, as in [aeiou]. Use Hyphen "-" for a range, as in [0-9].
[^]	match any one character except those enclosed in [ ], as in [^0-9].
. (Period)	match a single character of any value, except end of line.
* (Asterisk)	match zero or more of the preceding character or expression.
\{x,y\}	match x to y occurrences of the preceding.
\{x\}	match exactly x occurrences of the preceding.
\{x,\}	match x or more occurrences of the preceding.

grep Command

Examples of Regular Expression:

Example	Description
grep “smile“ files	**search *files* for lines with ‘smile’**
grep '^smile' files	**'smile' at the start of a line**
grep 'smile$' files	**'smile' at the end of a line**
grep '^smile$' files	**lines containing only 'smile'**
grep '\^s' files	**lines starting with '^s', "\" escapes the ^**
grep '[Ss]mile' files	**search for ‘Smile' or 'smile'**
grep 'B[oO][bB]' files	**search for BOB, Bob, BOb or BoB**
grep '^$' files	**search for blank lines**
grep '[0-9][0-9]' file	**search for pairs of numeric digits**

fgrep Command

The fgrep command is similar to grep command.

Syntax:

```
$fgrep  [ -e pattern_list] [-f pattern-file] [pattern] [Search file]
```

The fgrep command is useful to search files for one or more patterns, which cannot be combined together.

It does not use regular expressions. Instead, it does direct string comparison to find matching lines of text in the input.

fgrep Command

Options of fgrep command:

- -e pattern_list :
  - It searches for a string in pattern-list.
- -f pattern-file :
  - It takes the list of patterns from pattern-file.
- pattern
  - It specifies a pattern to be used during the search for input.
  - It is same as grep command.
- E.g To search employee file for all patterns stored in mypattern file

  $ fgrep –f mypattern employee.lst

egrep Command

The egrep command works in a similar way. However, it uses extended regular expression matching.

- Syntax:

```
egrep [ -e pattern_list ] [-f file ] [ strings ] [ file]
```

- **Example:** To find all lines with name “aggrawal” even though it is spelled differently:

```
$ egrep '[aA]gg?[ar]+wal' stud.lst
```

Summary

In this lesson, you have learnt:

- The head and tail filter commands filter the file horizontally.
- The cut and paste commands filter the file vertically.
- -m option of sort command is used to merge two sorted files.
- The tee command helps us to send o/p to standard o/p as well as to file.
- grep, fgrep, and egrep commands use to search files for some pattern.

Review Questions

Question 1: ___ command to display directory listing on screen as well as store it in dirlist.lst.

Question 2: ___ filter commands filter file vertically?

Question 3: ___ filter commands filter file horizontally?