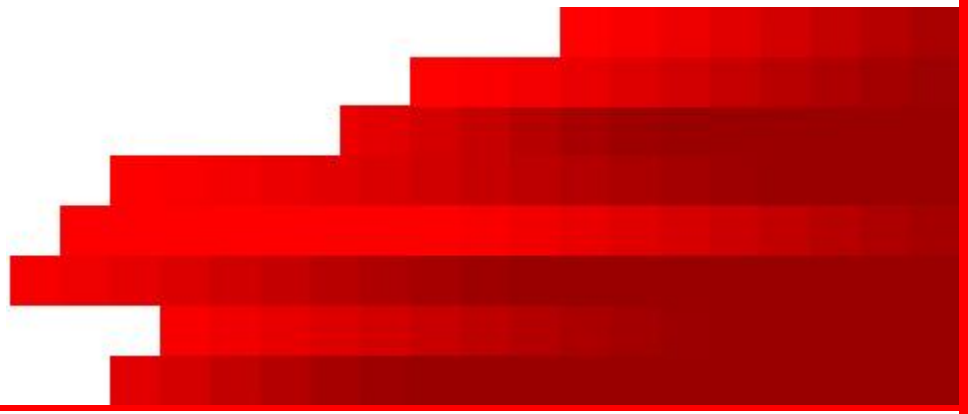
# UNIX and Shell scripting

## Module 2 – File Commands and Filters



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# Objectives

- Search for a file using '*find*' command
- which command
- File comparison commands
- File redirection
- Pipes and Filters

# Locating files

- find - Searches the named directory and it's sub-directories for files with a matching expression.

Example:

- $ find ./ -name “employee.txt"
  - Which searches the current directory ( and all of its sub-directories ) for a file employee.txt and prints them out.
- Options
  - -type
    -type f → search for ordinary files
    -type d → search for directory
  - -name – name of the file or a directory
    Pattern searching – always string enclosed in quotes

# Locating files (contd..)

## -mtime

- -mtime n → File modified in exactly n days
- -mtime +n → File modified in more than n days
- -mtime –n → File modified in less than n days

## -exec

- This option allows to execute a command for files located by find command
- $ find . –name temp –type f –exec rm {} \;

  This will remove temp files

## -ok

- Seeks user's confirmation for command execution of –exec option
- $ find . –name temp –type f –ok rm {} \;

# Input / output redirection

- Input redirection
- Output redirection
- Standard error redirection

- 0 standard input
- 1 standard output
- 2 standard error

# Input redirection

- Changing the default input source
- Input redirection operator ‘<‘
- $ command < filename

- Example :
  - $ cat <employee.dat

# Output redirection

- Changing the default destination of the output
- The output redirection operator is ‘ >’
- $ command > filename

- Example:
  - $ cat emp.dat > emp.out
  - $ date > todays_date
  - $ cat > file1
  - $ cat >> file2

# Error redirection

- Changing the default input source
- Input redirection operator ‘2 >‘
- $ command 2 > errorfile
- Eg :
  - $ cat customer.dat > customerdetails.txt  2 > errorfile

# Pipes and filters

- Pipes :Connects two or more commands
- Filters : Unix command which takes its input from standard input file, processes it and sends the output to standard output file
- In this lesson, we are going to look at the following filters:

  - wc
  - pg
  - more
  - tee
  - tr
  - grep
  - sort
  - cut
  - paste
  - head
  - tail

# Pipes

- The pipe ('|') operator is used to create concurrently executing processes that pass data directly to one another.
- It is useful for combining the commands to perform more complex functions.

- Example: $ who | grep “Raghu”

# Filters: grep

- grep – ( global search for regular expression and print)
- grep is the standard searching and selection utility

- $ grep [options] “pattern” <filename>

- Options :
  - -n : prints the line along with line numbers
  - -v : the reverse search criterion
  - -c : display only a count of matching patterns

# Filters: grep (cont..)

## Examples:

- grep “Raghu” employee.dat
  - Prints the line(s) containing the string Raghu.
- grep –n “Raghu” employee.dat
  - Prints the lines containing the string Raghu preceded by the line number
- grep –v “Raghu” employee.dat
  - Display the lines of the file excluding the lines containing the string Raghu.

# Regular expressions

| Regular expressions | Description |
|---|---|
| [ ] | To specify a pattern which consists of any one character. “[xyz” specifies the pattern either “x” or “y” or “z” |
| [ ] with hyphen | Range of characters “[1-9]” indicates a number in a range of 1 to 9 |
| ^ | The pattern following it must occur at the beginning of the line.<br>“^[123]” indicates the line must start with 1 or 2 or 3. |
| [^] | Searched string should not contain the characters followed by the ^. |

# Regular expressions (cont..)

| | |
|---|---|
| . | Single character, “[123]”. Indicates that the pattern should have 1,2 or 3 followed by single character. |
| $ | Specifies the pattern preceded should appear at the end of each line.“[abc]$” indicates a, b or c must appear at the end of the line. |

# Use of grep as a filter

Example:

- To find if employee.dat is present in the current folder

```
ls | grep “employee.dat”
```

- To find if a given user is logged in or not

```
who | grep “Raghu”
```

# sort

- Sort
  - Sorts the contents of a file.
    - `sort [-b f n r o t] [file name(s)]`
  - Takes the contents of a file(s) and displays it in sorted order.
  - Flags:

| | |
|---|---|
| -b | ignores blanks |
| -f | change all lower case letter to upper case before comparing |
| -n | numeric sort |
| -r | reverse usual order |
| -o | sends output of command to some file |
| -t | field delimiter |

  - E.g. To sort the Emp.txt on 2nd field in reverse order

```
$sort -t, -n -r +2 Emp.txt
```

# sort (contd..)

- sort  <enter>
- Eg:
  - To sort the contents of a file
  - $ sort namelist
  - $ sort –r namelist
  - $ sort –n numbers ( to sort the numbers)
  - $ sort +2  -3  employee
  - $ sort +2 -3 +3 -4 employee
  - $ sort –t “:” +2 -3 –o newfile customer

# Using cut as a filter

- To display a sorted list of the first name and salary of all employees belonging to Sales.

```
$ grep "sales" employee | cut –d " "-f 2,8 | sort
```

# cut

- $ cut –c4-9 employee
  - Display characters 4 to 9 from each record
- $ cut –d " " –f2-4 employee
  - Display 2-4 fields
- $ cut –f 4- employee
  - Display 4th field onwards

# paste

- Merges files horizontally.

  $ paste <file1> <file2>

  Options –d delimiter

# Examining the file contents

- Head[-n]  display first n lines of a file
- tail[+/-n]
- wc[-lcw]
- more
- tr
- tee

# head and tail

- head employee will display first 10 lines
- head -5 employee
- tail employee last 10 lines from the employee
- tail -7 employee
- tail +10 employee display lines from 10th till the end of the file.

# wc

- wc  word count

Options:

-c  - character count

-w  - word count

-l  - line count

- $ wc employee

- Examples:
  - To count the number of files in a directory
  - To count the number of users currently logged in

# more

- Command displays 23 lines at a time
- ls –l | more
- Display the directories one screenful at a time

# tee

- Used to redirect the output to two different destinations
- Transfers data without any changes to the destination

- Example:
- ls –l | grep “^-” | tee filelist |  tr –s “ “ | cut –d “ “ –f 5,9

# tr

- Translates the input into some other form
- Squeezes the repetitive characters from the input

- tr –s “ ” <  <filename>

Examples:

- Convert all lowercase to uppercase
  - cat customer.dat | tr “[a-z]” “[A-Z]”
- To display only login names and time of login from the output of “who” command
  - who | tr –s “ ” | cut –d “ ” –f1, 5

# Hands on

- Display the frequencies of different words present in the input
  -
- To find the largest file in the current directory
  -


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