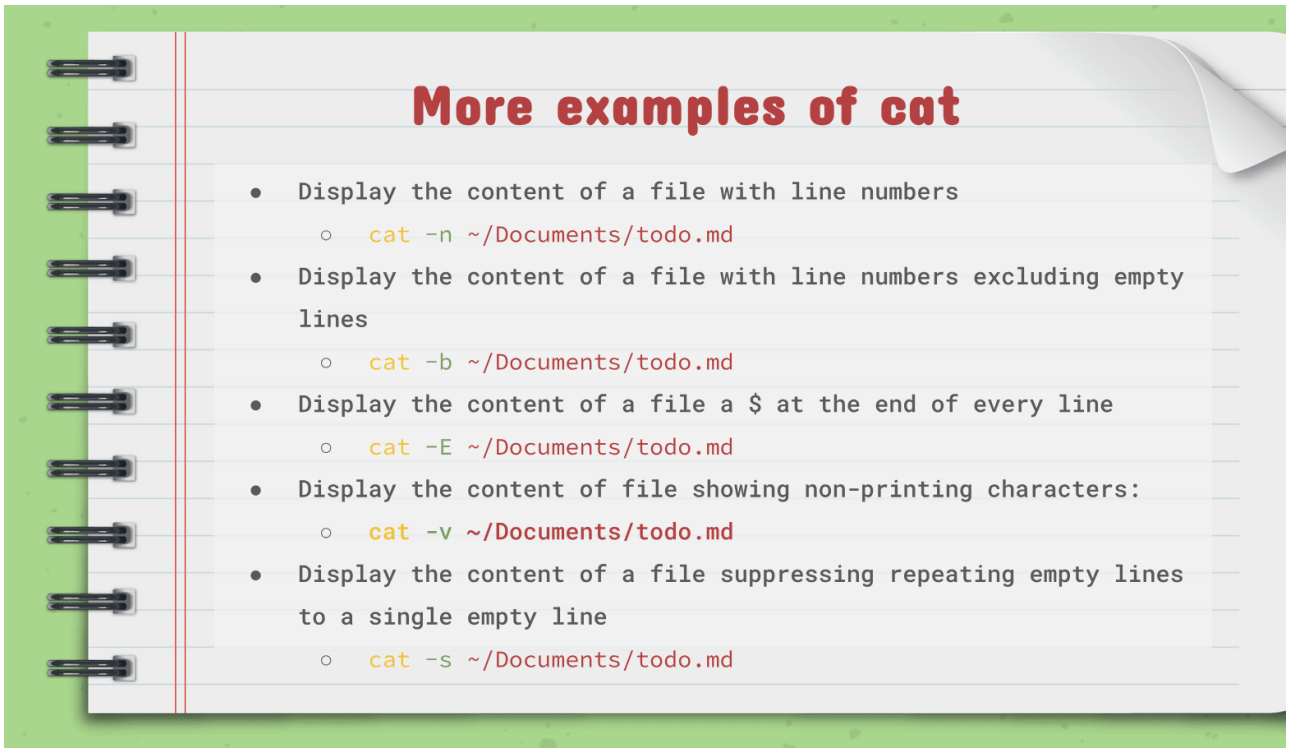
Notes 7

Handling Text Files

The cat Command:

- Description:
  - The cat command is used for displaying the content of a file.
  - Cat is short for concatenate which is the command's intended use.
- Usage:
  - cat + option +file(s) to display
- Examples:
  - Display the content of a file located in the pwd; cat todo.lst
  - Display the content of a file using absolute path; cat ~/Documents/todo.lst
- More examples of cat:



The tac Command:

- Description:
  - The tac command is used for displaying the content of a file in reverse order.
  - Just like cat, tac concatenates files and displays the output of the concatenation.
- Usage:
  - tac + option + file(s) to display

- Examples:
  - Display the content of a file located in the pwd;tac todo.md
  - Display the content of a file using absolute path; tac ~/Documents/todo.md

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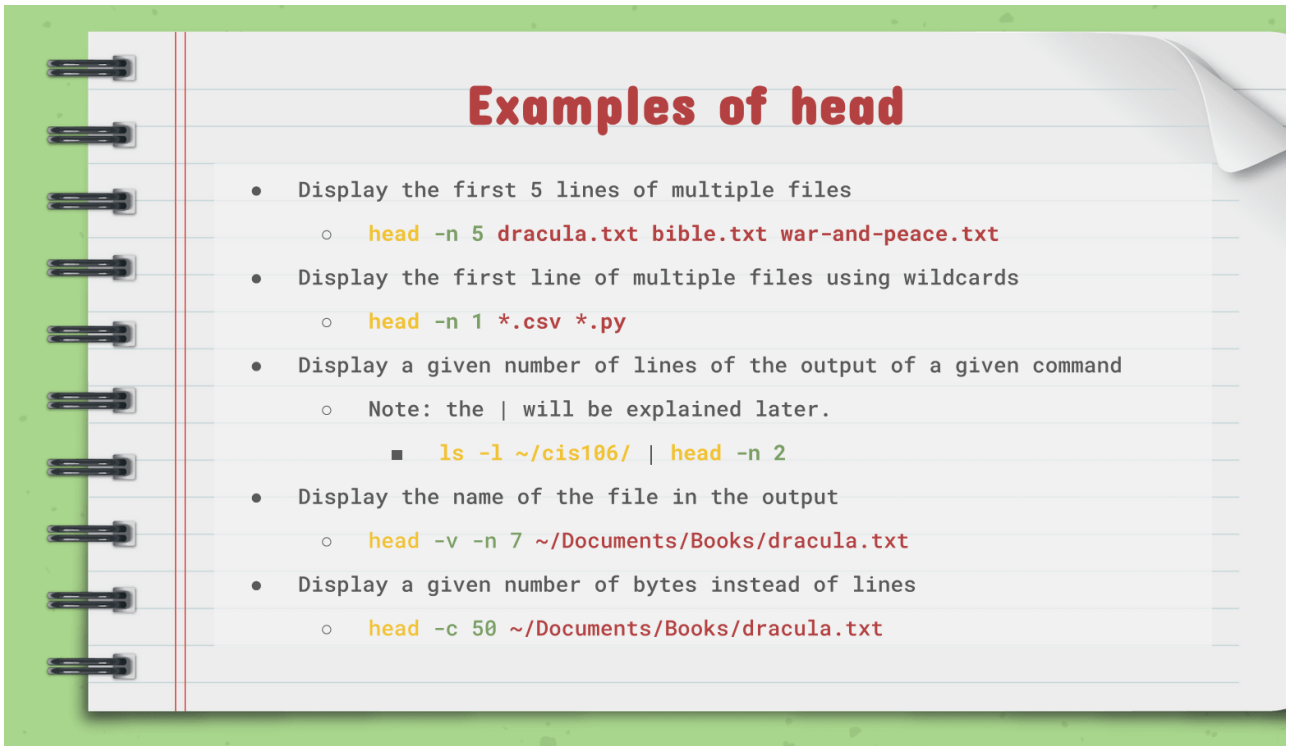
The head Command:

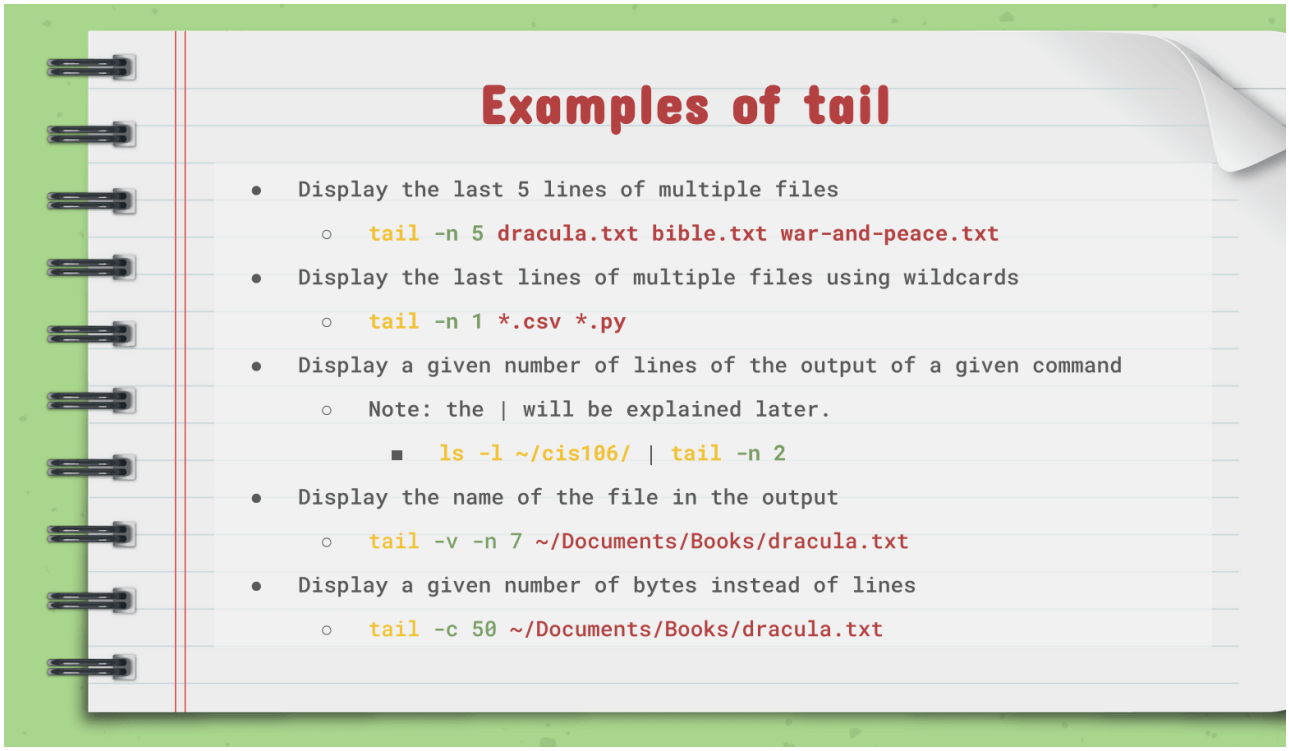
- Description:
  - THe head command displays the top N number of lines of a given file.By default, it prints the first 10 lines. If more than one file name is provided then data from each file is preceded by its file name.
- Usage:
  - head + option + file(s)
- Examples:
  - Display the first 10 lines of a file; head ~/Documents/Book/dracula.txt
  - Display the first 5 lines of a file; head -5 ~/Documents/Book/dracula.txt
- More Examples of head:



The tail Command:

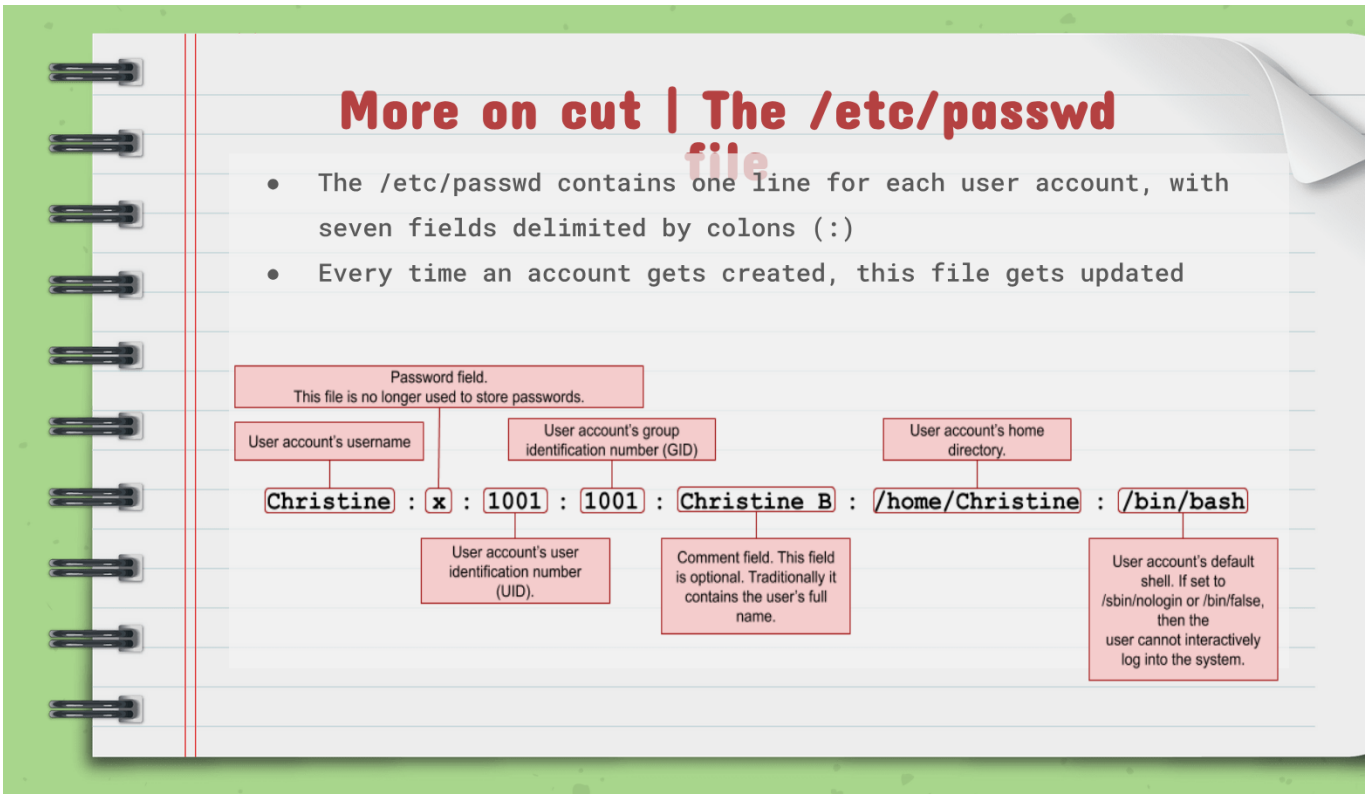
- Description:
  - The tail command displays the last N number of lines of a given file. By default, it prints the first 10 lines. If more than one file name is provided then data from each file is preceded by its file name.

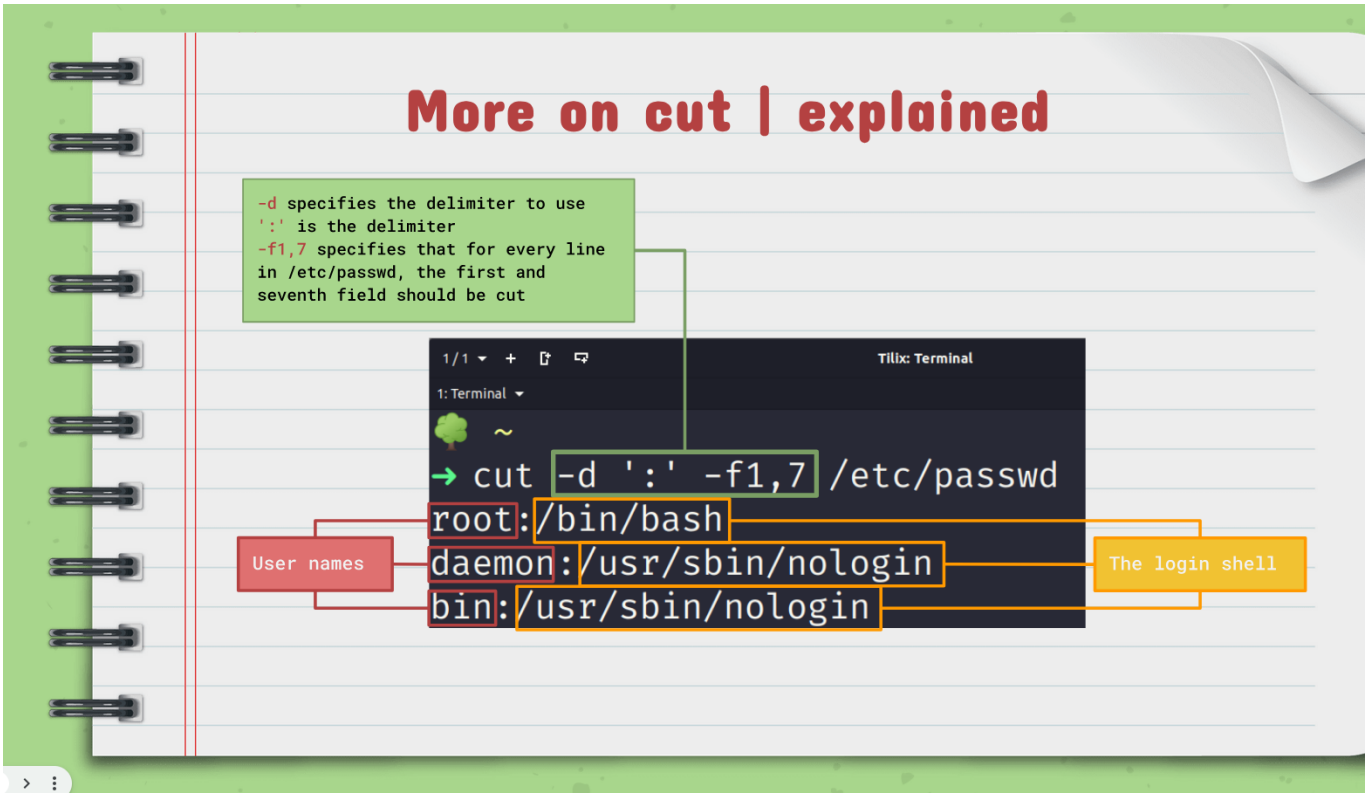
- Usage:
    - tail + option + file
- Examples:
    - Display the last 10 lines of a file; tail ~/Documents/Book/dracula.txt
    - Display the last 5 lines of a file; tail -5 ~/Documents/Book/dracula.txt
- More Examples of tail:

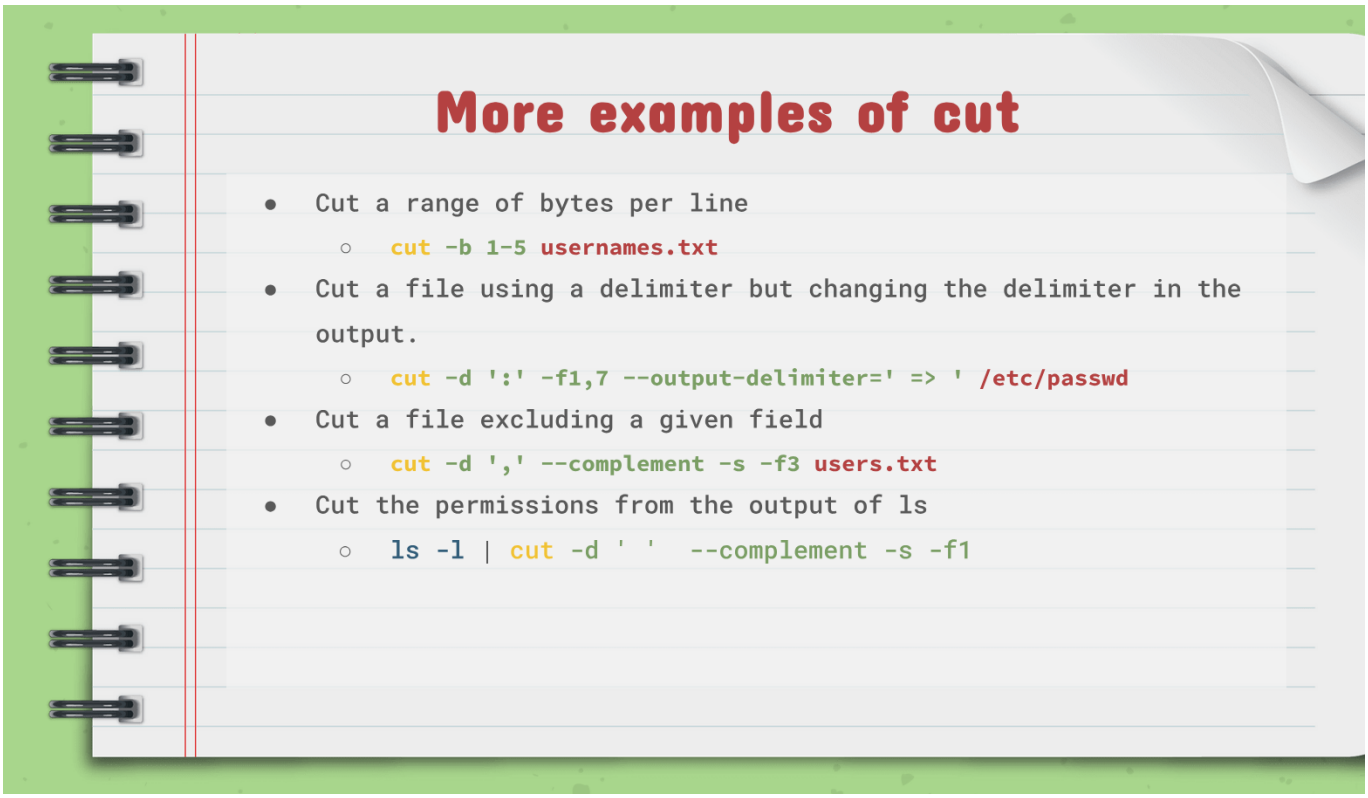


The cut Command:

- Description:
    - The cut command is used to extract a specific section of each line of a file and display it to the screen.
- Usage:
    - cut + option + file(s)
- Examples:
    - Display a list of all the users in your system; cut -d ':' -f1 /etc/passwd
    - Display a list of all the users in your system with their login shell; cut -d ':' -f1,7 /etc/passwd
- More Examples of cut:

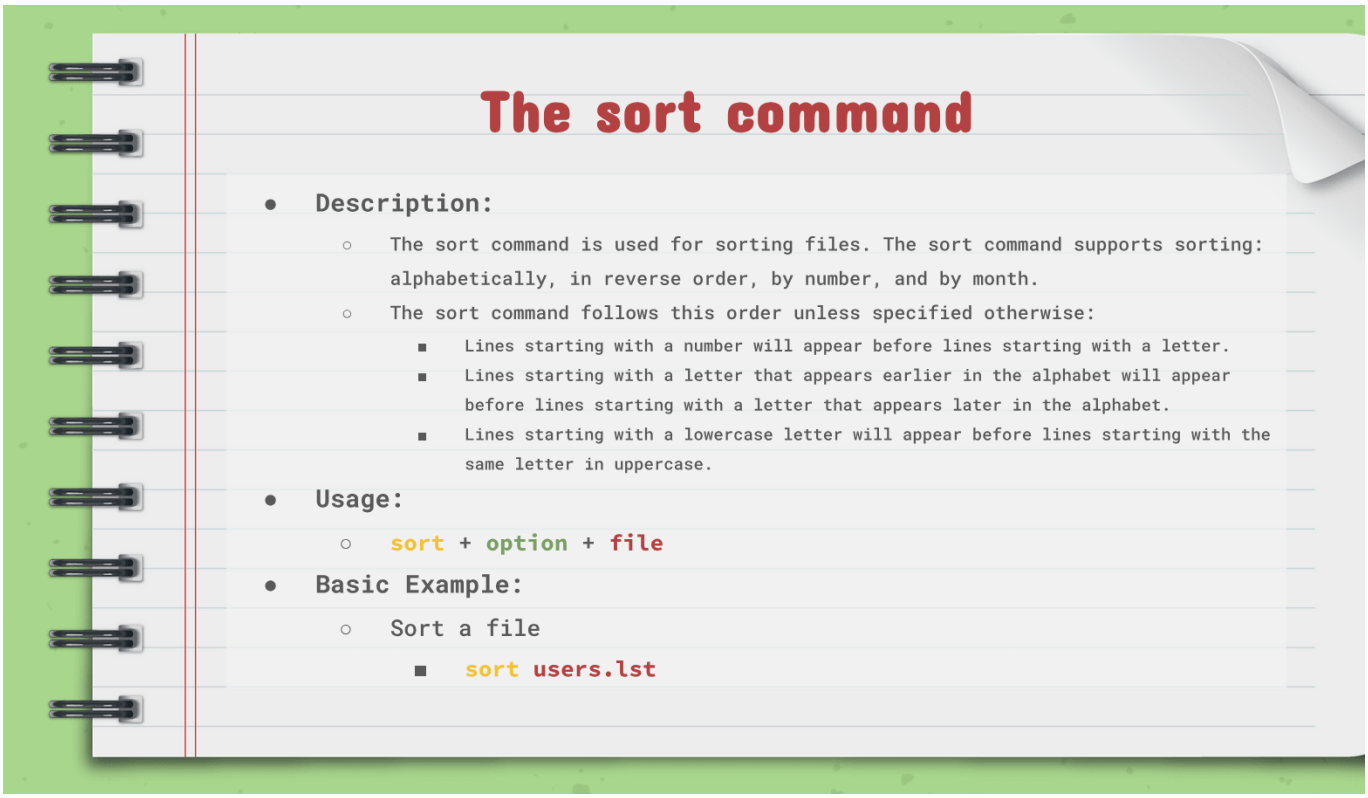

More on cut | The /etc/passwd file
The /etc/passwd contains one line for each user account, with seven fields delimited by colons (:)
Every time an account gets created, this file gets updated
Password field. This file is no longer used to store passwords.
User account's username
User account's group identification number (GID)
User account's home directory.
Christine : x : 1001 : 1001 : Christine B : /home/Christine : /bin/bash
User account's user identification number (UID).
Comment field. This field is optional. Traditionally it contains the user's full name.
User account's default shell. If set to /sbin/nologin or /bin/false, then the user cannot interactively log into the system.

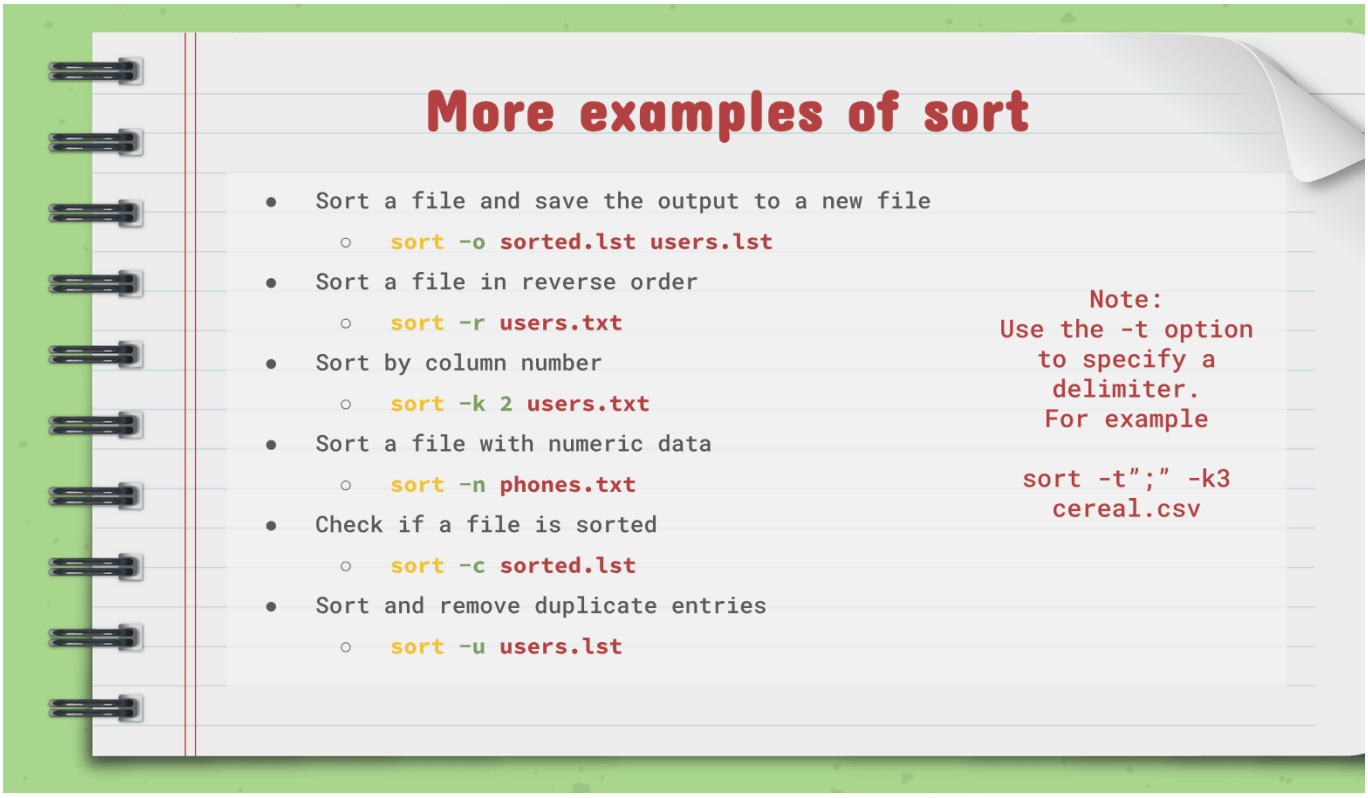

More on cut | explained
-d specifies the delimiter to use
':' is the delimiter
-f1,7 specifies that for every line in /etc/passwd, the first and seventh field should be cut
Tilix: Terminal
1: Terminal
→ cut -d ':' -f1,7 /etc/passwd
root:/bin/bash
daemon:/usr/sbin/nologin
bin:/usr/sbin/nologin
User names
The login shell



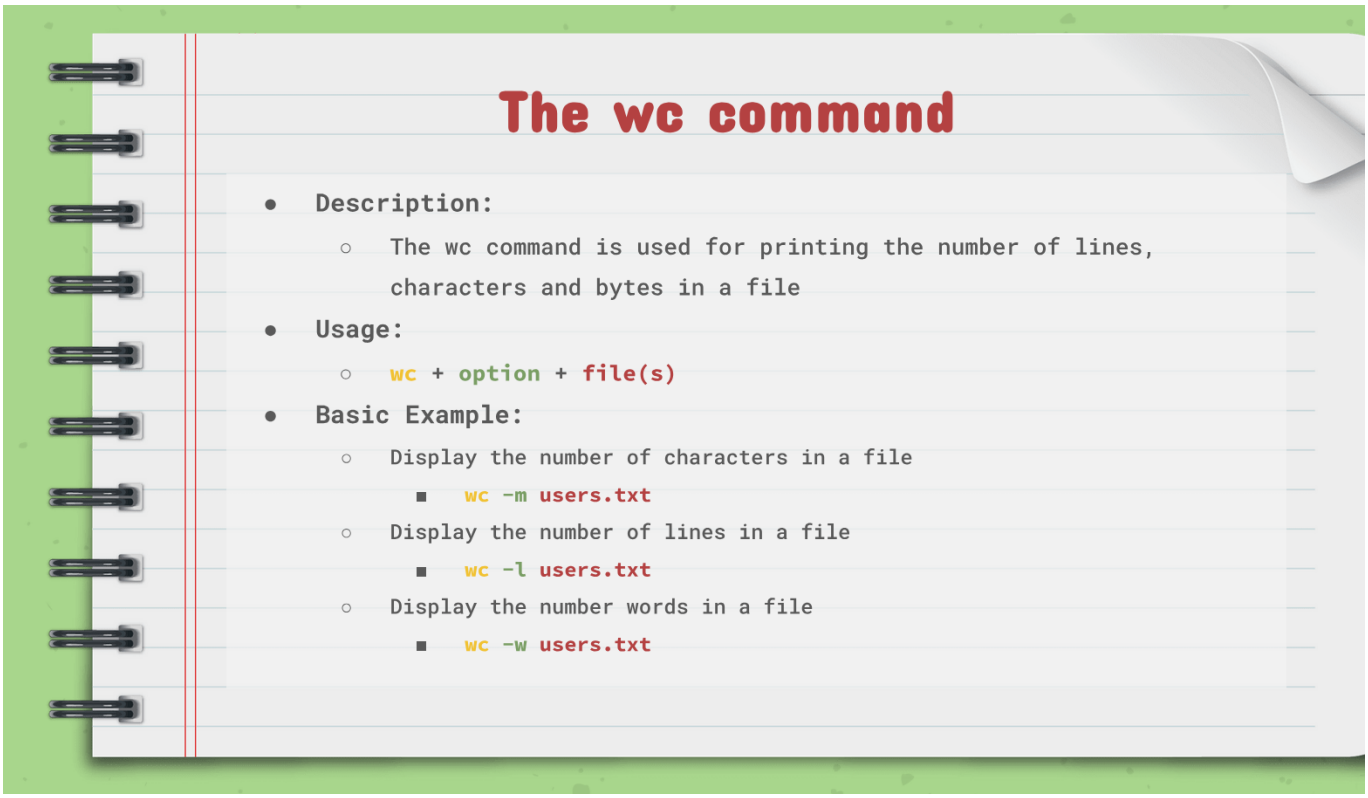
The paste Command:

The sort Command:

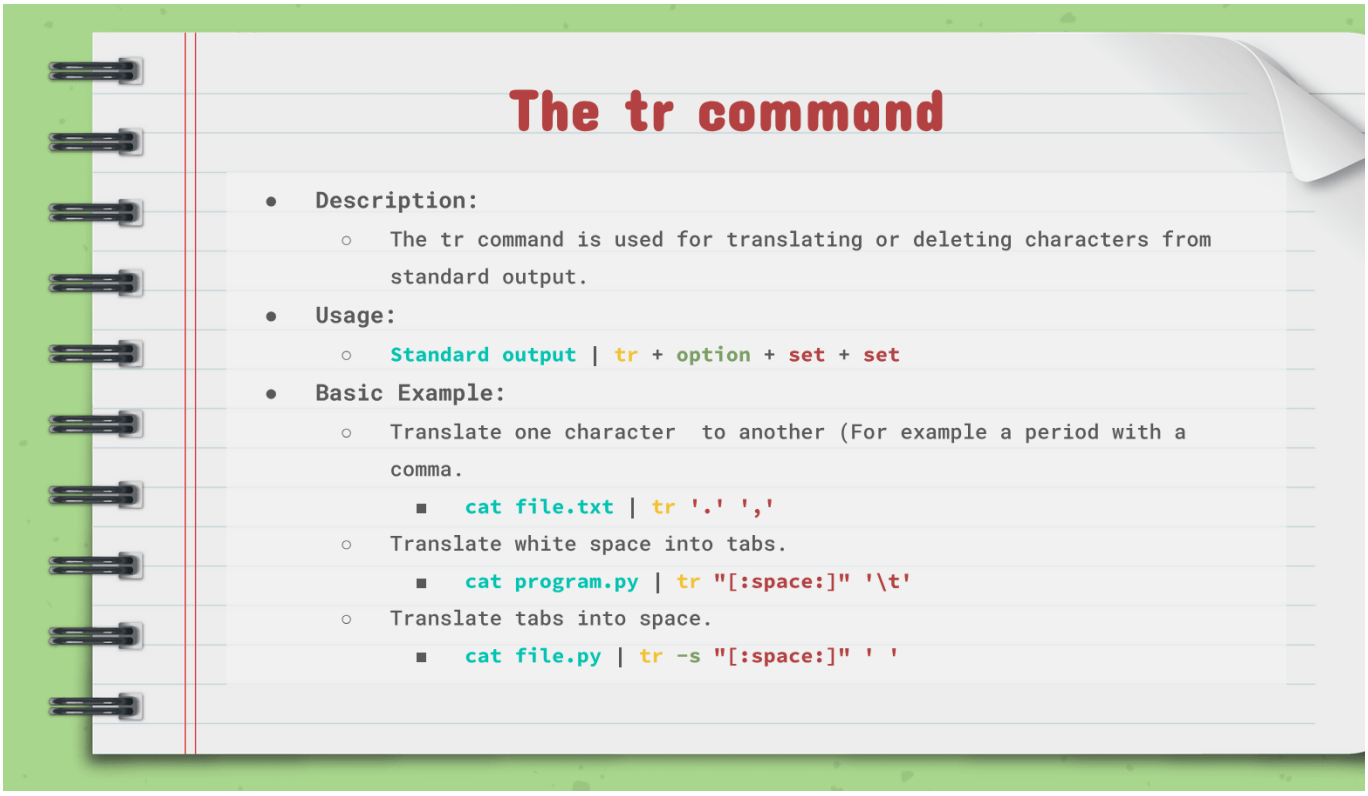




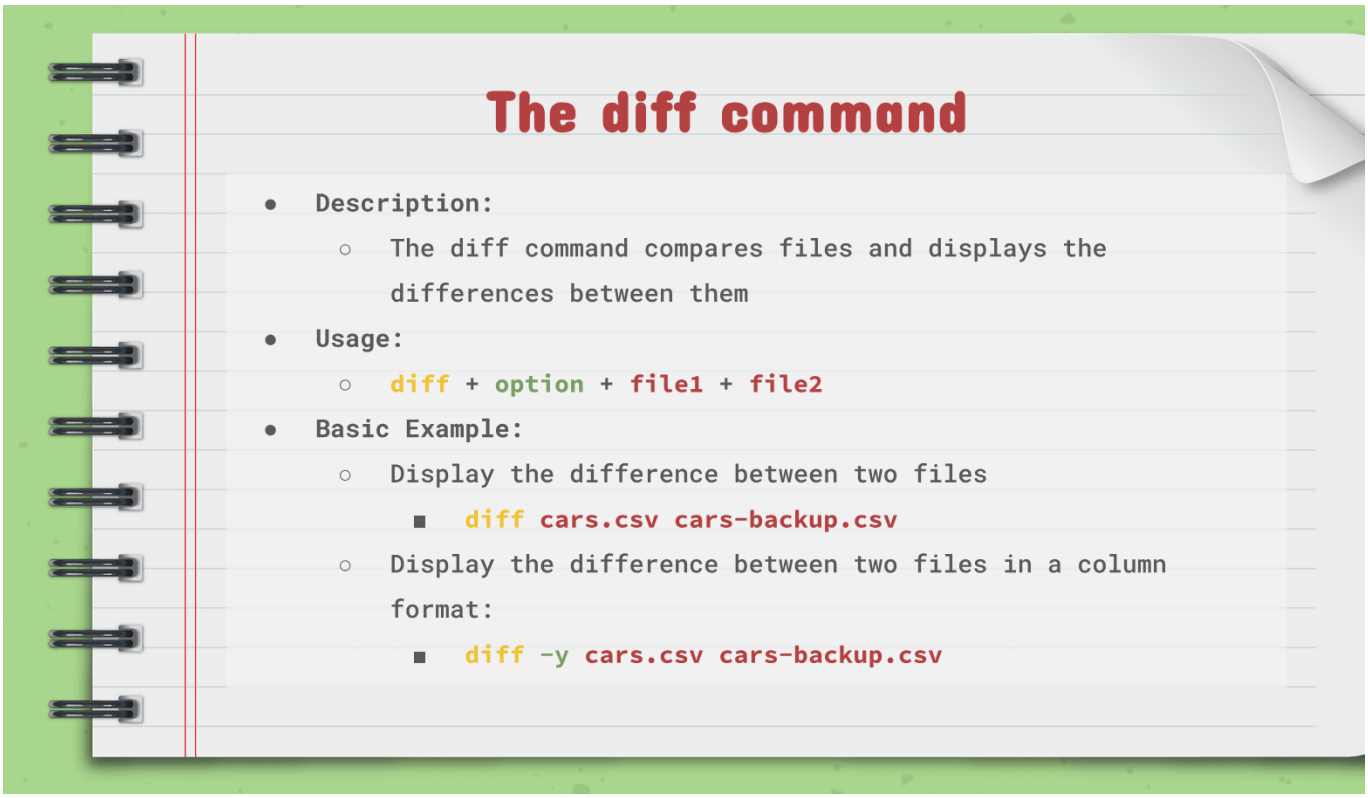
The wc Command:



The tr Command:



The diff Command:



The grep Command:

- Description:
  - Grep is used to search text in given file. Grep works line by line basis (it matches the search criteria ina line by line basis).
- Usage:
  - grep + option + search criteria + file(s)
- Example:
  - search any line that contains the word "dracula" in the given file; grep 'dracula' ~/Documents/dracula.txt
- More Examples of grep:

Common options of grep

Option	Explanation
-i	Enables case insensitivity. (it will match regardless of case)
-n	Displays line number for every line matched
-E	Treats the pattern (search criteria) as an extended regular expression
-G	Treats the pattern (search criteria) as a basic regular expression
-v	Inverts the search (looks for the opposite of the given criteria)
-o	Only displays the matched string
-c	Search and display the total number of times a pattern is matched
-w	Matches only the given word (pattern) by itself.
-r, -R	Matches recursively. Useful for searching files in a given directory

More examples of grep

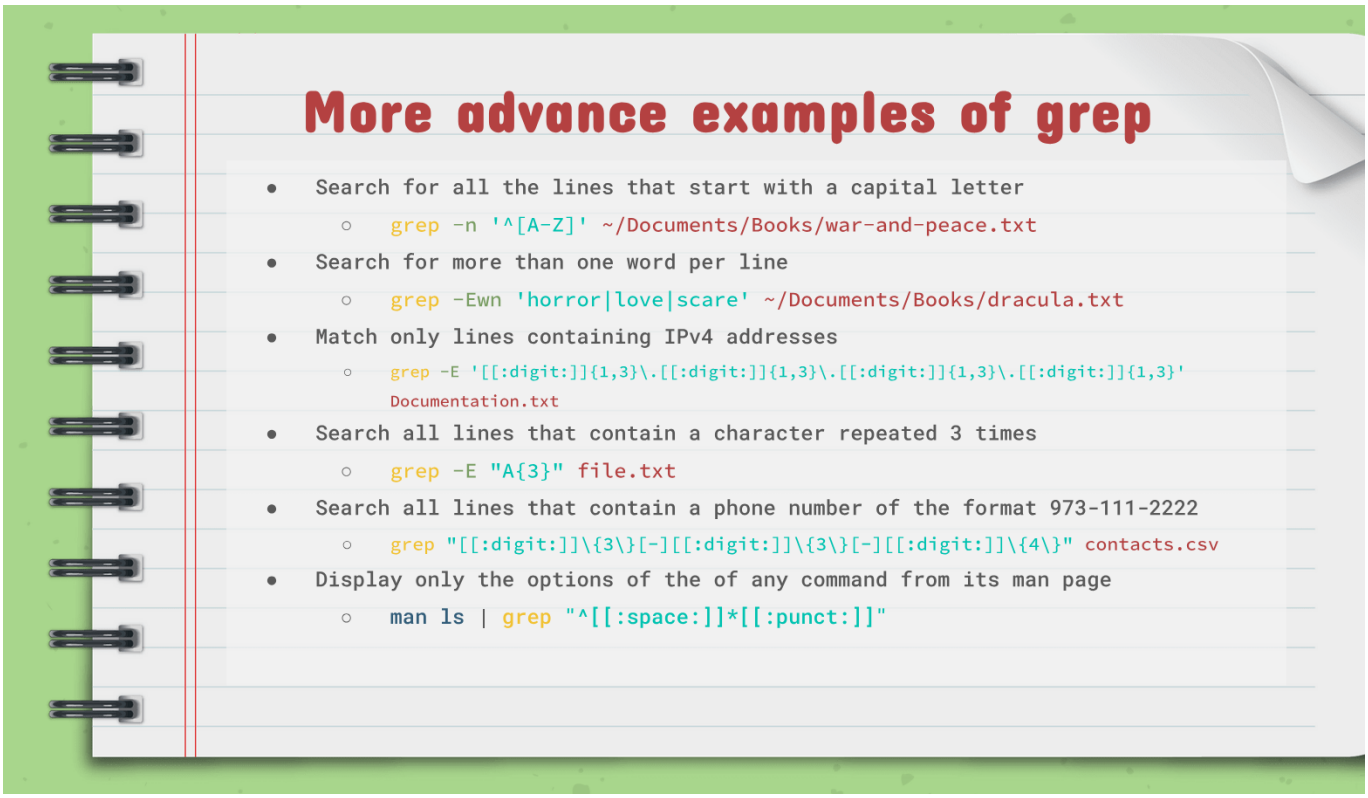
- Search any line that contains the word 'dracula' regardless of the case
  - `grep -i 'dracula' ~/Documents/Books/dracula.txt`
- Search any line that contains the word dracula regardless of case and with number line
  - `grep -in 'dracula' ~/Documents/Books/dracula.txt`
- Search for all the lines that do not contain the word 'war'
  - `grep -v 'war' ~/Documents/Books/war-and-peace.txt`
- Search and display only the matched string (pattern)
  - `grep -o 'pride' ~/Documents/Books/war-and-peace.txt`
- Display how many lines contain the matched string
  - `grep -c 'dracula' ~/Documents/Books/dracula.txt`

More examples of grep

- Search for a given strings inside files in a given directory.
  - `grep -iR 'conf' /etc/`
- Search and display the total number of times a given word appears in a file
  - `grep -wc '/bin/bash' /etc/passwd`
- The ^ (caret) symbol matches the empty string at the beginning of a line. Search for all the lines that start with a given word.
  - `grep -ni '^dracula' ~/Documents/Books/dracula.txt`
- Search for all the lines that ends with the string "nologin"
  - `grep -n 'nologin$' /etc/passwd`

More examples of grep

- Search for all the lines that contain a single word in all the files in your system
  - `grep -niR '^linux$' /`
- The . (period) symbol is a meta-character that matches any single character. Search for all the lines that contain a word that starts with letter d has 4 characters after.
  - `grep -n '^d....' ~/Documents/Books/dracula.txt`
- Bracket expressions allows match a group of characters by enclosing them in brackets []. Match all the lines that contain a the words list, last, lost.
  - `grep -n 'l[aio]st' ~/Documents/Books/dracula.txt`



The awk Command:

- Description:
  - Awk is a scripting language used for processing and displaying text. Awk can work with a text file or from standard output. Awk was created in Bell labs during the 70s by Alfred Aho, Peter Weinberger, and Brain Kernighan and its name comes from its authors' initials. There are several implementations of Awk: nawk, mawk, gawk, and busybox.
  - Awk performs operations line by line.
- Usage:
  - awk = option + {awk command} + file + file to save (optional)
- Example:
  - print the first column of every line of a file; awk '{print $1}' ~/Documents/Csv/cars.csv
- More Examples on AWk:

Awk Variables

$0	Whole line
$1,$2..$NF	First, second… last field
NR	Total Number of Records
NF	N number of Fields
OFS	Output Field Separator (default " ")
FS	input Field Separator (default " ")
ORS	Output Record Separator (default "\n")
RS	input Record Separator (default "\n")
FILENAME	Name of the file
ARGC	Number or arguments

ARGV	Array of arguments
FNR	File Number of Records
OFMT	Format for numbers (default "%.6g")
RSTART	Location in the string
RLENGTH	Length of match
SUBSEP	Multi-dimensional array separator (default "\034")
ARGIND	Argument Index
ENVIRON	Environment variables
IGNORECASE	Ignore case
CONVFMT	Conversion format
ERRNO	System errors
FIELDWIDTHS	Fixed width fields

More examples of AWK

- Print first field of /etc/passwd file
  - `awk -F: '{print $1}' /etc/passwd`
- Print the last field of the /etc/passwd file
  - `awk -F: '{print $NF}' /etc/passwd`
- Print the first and last field of the /etc/passwd
  - `awk -F: '{print $1," = ",$NF}' /etc/passwd`
- Print the first and 3 field with line numbers
  - `awk -F: '{print NR,$1,$3}' /etc/passwd`
- Print the first and 4th field with a different field separator
  - `awk -F: '{OFS="="}{print $1,$4}' /etc/passwd`
- Start printing a file from a given line(exclude the first 2 lines)
  - `awk 'NR > 3 { print }' /etc/passwd`

More examples of awk

- Convert the first field to upper/lower case
  - `awk -F: '{print toupper($1)}' /etc/passwd`
- Prints the length of a line(record)
  - `awk '{print length($0)}' /etc/passwd`
- Print specific fields based on a command output. For example, the size and file name

```
ls -lhF Documents/ | awk 'BEGIN { printf "%s\t%s\n", "Size","Name"} {print $5,"\t",$9}'
```

  - BEGIN block is executed once at the start
- Print specific fields with a head of the /etc/passwd file

```
awk -F: 'BEGIN { printf "%s\t\t%s\n","User", "Shell" } {print $1,"\t",$7}' /etc/passwd
```

A more interesting example of awk

```
➜ ls -lhd --time-style=+%D ./* | awk -v OFS='\t' 'BEGIN { printf "%s\t%s\t%s\t%s\t%s\t%s\t%s\n", "Permissions", "Links","User","Group","Size","Date Modified","Name"} {print $1,$2,$3,$4,$5,$6,
Permissions     Links   User    Group   Size    Date Modified   Name
drwxrwxr-x      3       adrian  adrian  4.0K    03/02/22        ./Applications
drwxrwxr-x      3       adrian  adrian  4.0K    04/03/22        ./Calibre
drwxrwxr-x      2       adrian  adrian  4.0K    04/06/22        ./challenge-Lab6
drwxr-xr-x      2       adrian  adrian  4.0K    03/01/22        ./Desktop
drwxr-xr-x      5       adrian  adrian  4.0K    04/12/22        ./Documents
lrwxrwxrwx      1       adrian  adrian  28      03/03/22        ./dotfiles
drwxr-xr-x      10      adrian  adrian  24K     04/12/22        ./Downloads
drwxrwxr-x      2       adrian  adrian  4.0K    04/03/22        ./filesAwkExamples
drwxrwxr-x      2       adrian  adrian  4.0K    04/02/22        ./games
drwxrwxr-x      27      adrian  adrian  60K     04/10/22        ./gdrive
drwxrwxr-x      9       adrian  adrian  4.0K    04/02/22        ./gems
drwxrwxr-x      2       adrian  adrian  4.0K    04/12/22        ./json-files
drwxrwxr-x      7       adrian  adrian  4.0K    04/02/22        ./lab5
-rw-rw-r--      1       adrian  adrian  4.1M    04/02/22        ./lab5.zip
drwxrwxr-x      2       adrian  adrian  4.0K    04/11/22        ./lab6
drwxrwxr-x      2       adrian  adrian  4.0K    04/02/22        ./movies
drwxr-xr-x      3       adrian  adrian  4.0K    04/04/22        ./Music
drwxr-xr-x      3       adrian  adrian  4.0K    03/05/22        ./Pictures
drwxr-xr-x      2       adrian  adrian  4.0K    03/01/22        ./Public
-rw-rw-r--      1       adrian  adrian  0       04/04/22        ./song.mp3
drwxrwxr-x      3       adrian  adrian  4.0K    03/02/22        ./Steam
drwxr-xr-x      2       adrian  adrian  4.0K    03/01/22        ./Templates
-rw-rw-r--      1       adrian  adrian  108     04/09/22        ./todo.md
-rwxrw-r--      1       adrian  adrian  511     04/09/22        ./urls.sh
drwxr-xr-x      2       adrian  adrian  4.0K    04/07/22        ./Videos
drwxrwxr-x      7       adrian  adrian  4.0K    03/21/22        ./VirtualBox
```