Introduction to Linux

1. To change a directory: cd [PATH] ex: cd Documents/
   a. Jump one directory up: cd ..
   b. Go to the home directory: cd ~

2. To list a directory's content: ls
   a. Lists files and directories in long format, providing detailed information (permissions, owner, size, modification date): ls -l
   b. Includes hidden files and directories in the listing (those starting with a dot): ls -a
   c. Displays file sizes in a human-readable format (kilobytes, megabytes…): ls -h
   d. Sort files and directories by their last modification time, displaying the most recently modified ones first: ls -t
   e. Reverses the order of the listing, displaying items in reverse alphabetical or chronological order: ls -r
   f. Sort files and directories by their sizes, listing the largest ones first: ls -S

3. create a new directory: mkdir [NAME] ex: mkdir FileTest

4. removes a directory: rmdir [NAME] ex: rmdir FileTest

5. Shows the current working directory's path: pwd

6. To display command manual: man [COMMAND]

File Operations and Processes

1. Create a user account: useradd -u [ID] -d /home/[NAME] -s /bin/bash [NAME]
   ex: useradd -u 1002 -d /home/robot -s /bin/bash robot

2. Verify user account: id [NAME] ex: id robot

3. Look at users: cat /etc/passwd

4. Delete user: sudo userdel [NAME] ex: sudo userdel robot

5. To add a user to a group: sudo usermod -aG [NAME2] [NAME]
   ex: sudo usermod -aG development john

6. Change the basic shell: sudo usermod -s /bin/zsh [NAME]
   ex: sudo usermod -s /bin/zsh john

7. Create a new group: sudo groupadd [NAME2]
   ex: sudo groupadd marketing

8. To change the group owner of a file: chgrp [USERGROUP] [FILE]

9. To delete a group: groupdel [GROUP]

10. To view group: cat /etc/group

11. super user: sudo [COMMAND]

12. Change the owner of a file: chown [OPTIONS] [NEW_OWNER] [FILE_OR_DIRECTORY]
    ex: chown robot file1.cpp
    a. Change the owner of the full directory: chown -R john example

13. Change permissions of a file or directory: chmod [OPTIONS] [PERMISSIONS] [FILE_OR_DIRECTORY]
    ex: chmod 755 example.txt
    a. change the permission of the full directory: chmod -R [PERMISSION] [PATH]

Value	Meaning
0	No permission
1	Execute permission
2	Write permission
3	Write and execute permission
4	Read permission
5	Read and execute permission
6	Read and write permission
7	Read, write, and execute permission

14. Switch to the superuser (root) account: sudo su

15. For directories requiring superuser permissions: sudo mkdir /path/to/new_directory

16. For file creation requiring superuser permissions: sudo touch /path/to/new_file.txt

File Operations and Processes

1. To copy a file: cp [FILE_OLD] [FILE_NEW] ex: cp file1.cpp file_copy.cpp

2. To copy location of a file: cp [FILE] [NEW_LOCATION] ex: cp file1.cpp /Documents/

3. To move a file from one location to the other: mv [FILE] [LOCATION]
   ex: mv file1.py /Documents/

4. To rename a file: mv [FILE_OLD] [FILE_NEW] ex: mv file1.py file_renamed.py

5. To delete a file: rm [FILE] ex: rm file1.cpp
   a. Remove all files in a directory: rm -rf *

6. To create an empty file: touch [FILENAME] ex: touch robot.cpp

7. To find a file: find [FILENAME]

8. To compress files: tar -zcvf file.tar.gz [PATH] ex: tar -zcvf file.tar.gz file.cpp
   a. Compress a file: tar -zcvf file.tar.gz [FILE_PATH]

b. Compress an entire directory: tar -zcvf file.tar.gz [DIRECTORY_PATH]
c. Compress multiple directories: tar -zcvf file.tar.gz [DIRECTORY1] [DIRECTORY2] DIRECTORY3] …
d. Compress files but excluding files: tar -zcvf archive.tar.gz --exclude='[DIRECTORY]'
e. Compress files but excluding directories: tar -czvf /nfs/backup.tar.gz --exclude=" DIRECTORY " [DIRECTORY]

9. To view files stored in an archive: tar -ztvf [FILE].tar.gz
   ex: tar -jtvf file.tar.bz2
   NOTE: bz2 and gz are box zip extensions
10. To extract a file: tar -xzvf file.tar.gz
    ex: tar -xjvf file.tar.bz2
    a. extract the contents of the archive into a specific directory: tar -xzvf my.tar.gz -C [DIRECTORY]
    b. tar -xjvf archive.tar.bz2 -C [DIRECTORY]

11. Text editor: nano
    a. If there exists an already text file: nano [FILENAME]
    b. Create a backup: nano -B myfile.txt
    c. Enabling Automatic Indentation: nano -I myfile.txt
    d. Constantly Showing Cursor Position: nano -c myfile.txt

Flag	Description	Example
-B	Makes a backup of the current file before saving changes.	nano -B myfile.txt
-I	Enables automatic indentation.	nano -I myfile.txt
-N	No conversion from DOS/Mac format.	nano -N myfile.txt
-T	Sets the size of a tab to the given number of spaces.	nano -T 4 myfile.txt
-U	Enables undo functionality.	nano -U myfile.txt
-Y	Syntax highlighting.	nano -Y sh myfile.sh
-c	Constantly show the cursor position.	nano -c myfile.txt
-i	Automatically indents new lines.	nano -i myfile.txt
-k	Toggle cut so it cuts from cursor position.	nano -k myfile.txt
-m	Enable mouse support.	nano -m myfile.txt

12. Vi text editor: vi myfile.txt
    a. press 'i' to enter insert mode
       ex: This is some text.
    b. press 'Esc' to exit insert mode
    c. type ':wq' to save and quit
    d. Output: 'myfile.txt' 1L, 18C written

13. To search a file for a particular pattern: grep [options] pattern [files]
    a. Count of lines: grep -c "WORD" [FILENAME]
    b. Matched files: grep -h "WORD"
    c. Ignores matches: grep -i "WORD" [FILENAME]
    d. Filenames only: grep -l "WORD"
    e. All lines with no match: grep -v "WORD" [FILENAME]
    f. Matched lines and line numbers: grep -n "WORD" [FILENAME]
    g. Match whole word: grep -o "WORD" [FILENAME]

14. To view the contents of a short file: cat FILENAME
    a. View number of lines: cat -n FILENAME

b. Displays control and non-printing characters followed by a $ symbol at the end of each line: cat -e FILENAME

15. To view the contents of a file: less FILENAME

16. To view the first few lines of files: head [OPTIONS] FILES
    The head command will, by default, write the first ten lines of the input file to the standard output
    a. Display certain number of lines: head -n [LINE_NUMBER] [FILENAME]
    b. If we pass the -n option together with a number following the –, for example -n -x, the head command will print all lines but the last x lines of the file: head -n -NUMBER [FILENAME]
    c. Print the file content by byte: head -c [NUMBER] [FILENAME]
    d. Output lines from both files in one shot: head -n [NUMBER] [FILE1] [FILE2]

17. To view the last few lines of files: tail [OPTIONS] FILES
    The tail command will by default write the last ten lines of the input file to the standard output:
    a. Display certain number of lines: tail -n [NUMBER] [FILENAME]
    b. If we pass the -n option together with a number following the –, for example -n -x, the tail command will print all lines but the last x lines of the file: tail -n -NUMBER [FILENAME]
    c. Print the file content by byte: tail -c [NUMBER] [FILENAME]
    d. Output lines from both files in one shot: tail -n [NUMBER] [FILE1] [FILE2]

18. To display information about processes: ps [options]
    a. To print all the processes within the system: ps -e
    b. To see a more detailed output: ps -f
    c. To searching for a particular process by name: ps -C [NAME]
    d. To filter based on a list of process ids: ps -p [ID]
    e. To search by the user name: ps -u [USER]

19. To list all running Linux processes on your system: top

20. To kill a process: kill [PID]
    a. To force kill a process: kill -9 [PID]

21. output (STDOUT) redirection: [COMMAND] > [FILE]

22. To communicate with the terminal: echo “TEXT”

23. If the contents of the file are to be added and not overwritten: [COMMAND] >> [FILE]

24. For input(STDIN) redirection : [COMMAND] < [FILE]

25. To get the word count: wc [FILENAME]

26. To compare the contents of two files and display the differences between them. diff [FILE1] [FILE2]

System Management and Basic Scripting

1. To know only the system name: uname
   a. To view your Linux network hostname: uname -n
   b. To get information about the Linux kernel version: uname -v
   c. To get the information about your Linux kernel release: uname -r
   d. To print your Linux hardware architecture name: uname -m
   e. All this information can be printed at once: uname -a

2. To tell the total disk size, space used, space available, usage percentage, and what partition the disk is mounted on: df

3. To see the size of a given directory or subdirectory: du

4. To list all unit files in your Linux server: sudo systemctl list-unit-files --type service –all

5. To stop a service: sudo systmctl stop [SERVICE]

6. To get the status of a service: sudo systmctl status [SERVICE]

7. To start a service: sudo systmctl start [SERVICE]

8. To restart a service: sudo systmctl restart [SERVICE]

9. List available shells on the system: cat /etc/shells

10. To check the current shell you are using: echo $0

11. Test whether you are using an interactive shell using, prints The current set of options in your current shell: [COMMAND] $-

12. To list the current environmental variables in your system: printenv/env

13. To load the variables into the workspace: source [BASH_SCRIPT]
    a. . [BASH_SCRIPT]

14. Get process id: echo $$