Linux Assignment

1.a Find all the processes running on the system.

```
▶→  ~ curl -o /dev/null -s -w "%{http_code}\n" https://www.google.com

200
▶→  ~
```

1.b Find the top 3 running processes which consume the most processing power.

```
labex:project/ $ ps -eo pid,comm,%cpu --sort=-%cpu | head -n 4

    PID COMMAND            %CPU
     36 Xvnc                1.9
    244 zsh                 1.2
    246 zsh                 1.2
labex:project/ $ ▌
```

2. Print the HTTP response code obtained from google.com.

```
AzureAD+Anshu@IN-KA-0DTMZQ MINGW64 ~/Desktop
$ curl -o /dev/null -s -w "%{http_code}" https://www.google.com
200
AzureAD+Anshu@IN-KA-0DTMZQ MINGW64 ~/Desktop
```

3. Find the top 3 running processes which consume the most processing power.

```
labex:project/ $ ps -A -o pid,%cpu,comm | sort -k 2 -nr | head -n 3

    371 18.0 zsh
    263  2.0 zsh
    261  2.0 zsh
labex:project/ $ ▌
```

4. Write a script that finds all files larger than 100MB in a directory and lists them.

```
labex:project/ $ find . -type f -size +100M -exec ls -lh {} \; | awk '{ print $9 ": " $5 }'
labex:project/ $ █
```

5. Find which version of Python is installed on the system.

```
↦   ~ python3 --version

Python 3.11.2
↦   ~
```

6. Get the current time zone of your system.

```
↦   ~ date +"%Z %z"

IST +0530
↦   ~ |
```

7. Get the current time in New York, London, and Sydney.

```
↦   ~ TZ="America/New_York" date
TZ="Europe/London" date
TZ="Australia/Sydney" date

Thu May 29 13:40:00 EDT 2025
Thu May 29 18:40:00 BST 2025
Fri May 30 03:40:00 AEST 2025
↦   ~
```

8. Check for how long the system is up.

```
→   ~ uptime

23:10  up 4 days,  3:13, 2 users, load averages: 3.28 3.40 3.73
→   ~
```

11. anshu

    a. Find all the errors in the log and dump them to a new file:

```
2025-02-18 08:47:34 ERROR Failed to connect to database
2025-02-18 08:51:45 ERROR Unable to write to log file
2025-02-18 08:56:45 ERROR Network timeout
2025-02-19 09:07:12 ERROR Failed to connect to database
2025-02-19 09:11:45 ERROR Unable to write to log file
2025-02-19 09:16:45 ERROR Network timeout
2025-02-19 09:29:45 ERROR Application crash
2025-02-20 10:07:12 ERROR Failed to connect to database
2025-02-20 10:11:45 ERROR Unable to write to log file
2025-02-20 10:16:45 ERROR Network timeout
2025-02-20 10:29:45 ERROR Application crash
```

b. What events occurred between 09:10 and 09:19?

```
→   Desktop grep -E "^2025-02-(18|19|20) 09:(1[0-9]):" sample.log

2025-02-19 09:10:15 INFO  User login successful: user2
2025-02-19 09:11:45 ERROR Unable to write to log file
2025-02-19 09:12:30 INFO  User logout: user1
2025-02-19 09:13:50 WARN  High memory usage detected
2025-02-19 09:14:22 INFO  User login successful: user3
2025-02-19 09:15:33 INFO  File upload completed: file1.txt
2025-02-19 09:16:45 ERROR Network timeout
2025-02-19 09:17:56 INFO  User logout: user2
2025-02-19 09:18:12 INFO  User login successful: user4
2025-02-19 09:19:23 INFO  Scheduled maintenance started
→   Desktop
```

c. How many INFO messages are in the log file?

```
├→   Desktop grep -c "INFO" sample.log

51
├→   Desktop
```

d. Print the first 5 lines of the file:

```
├→   Desktop head -n 5 sample.log

2025-02-18 08:45:12 INFO  Starting the application
2025-02-18 08:46:23 WARN  Low disk space on /dev/sda1

2025-02-18 08:47:34 ERROR Failed to connect to database
                 Details:
├→   Desktop |
```

e. Print the last 5 lines of the file:

```
├→   Desktop tail -n 5 sample.log

2025-02-20 10:29:45 ERROR Application crash
                 Details:
                 Null pointer exception in module X

2025-02-20 10:30:56 INFO  User logout: user5
├→   Desktop |
```

f. Print lines if they contain `error`, `fail`, or `warning` (case-insensitive):

```
├→   Desktop grep -iE "error|fail|warning" sample.log

2025-02-18 08:47:34 ERROR Failed to connect to database
2025-02-18 08:51:45 ERROR Unable to write to log file
2025-02-18 08:56:45 ERROR Network timeout
2025-02-19 09:07:12 ERROR Failed to connect to database
2025-02-19 09:11:45 ERROR Unable to write to log file
2025-02-19 09:16:45 ERROR Network timeout
2025-02-19 09:29:45 ERROR Application crash
2025-02-20 10:07:12 ERROR Failed to connect to database
2025-02-20 10:11:45 ERROR Unable to write to log file
2025-02-20 10:16:45 ERROR Network timeout
2025-02-20 10:29:45 ERROR Application crash
├→   Desktop
```

g. Rename the file to `new_log.txt` :

```
 ↪    Desktop mv sample.log new_log.txt

 ↪    Desktop
```

h. Edit the log file and add the string `"hello, world!"` at the beginning:

```
 ↪   Desktop sed -i '1ihello, world!' new_log.txt

sed: 1: "new_log.txt": extra characters at the end of n command
 ↪   Desktop
```

i. Delete the old log file (assuming it is `sample.log` but you renamed it to `new_log.txt` , so delete `sample.log` only if it still exists):

```
 ↪    Desktop rm -f sample.log

 ↪    Desktop
```

j. Filter entries containing `"INFO"` for a particular date (for example, `2025-02-19`):

```
╰→  Desktop grep "^2025-02-19.*INFO" new_log.txt

2025-02-19 09:05:23 INFO  Starting the application
2025-02-19 09:08:34 INFO  User login successful: user1
2025-02-19 09:09:56 INFO  Scheduled backup completed
2025-02-19 09:10:15 INFO  User login successful: user2
2025-02-19 09:12:30 INFO  User logout: user1
2025-02-19 09:14:22 INFO  User login successful: user3
2025-02-19 09:15:33 INFO  File upload completed: file1.txt
2025-02-19 09:17:56 INFO  User logout: user2
2025-02-19 09:18:12 INFO  User login successful: user4
2025-02-19 09:19:23 INFO  Scheduled maintenance started
2025-02-19 09:20:34 INFO  User logout: user3
2025-02-19 09:21:45 INFO  Application shutdown initiated
2025-02-19 09:22:56 INFO  Application shutdown completed
2025-02-19 09:23:45 INFO  System reboot initiated
2025-02-19 09:24:56 INFO  System reboot completed
2025-02-19 09:25:34 INFO  User login successful: admin
2025-02-19 09:27:56 INFO  User logout: admin
2025-02-19 09:28:34 INFO  User login successful: user5
2025-02-19 09:30:56 INFO  User logout: user5
╰→  Desktop
```

13. Output lines if you find the string `"Error"` (case-insensitive) in a file:

14. Connect to google.com and copy the output to a text file:

```
╰→  Desktop curl https://google.com > google_homepage.html

  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   220  100   220    0     0   1431      0 --:--:-- --:--:-- --:--:--  1437
╰→  Desktop |
```

15. Create a file called `example.txt` and make it read-only for all users:

```
╰→  Desktop touch example.txt
chmod 444 example.txt

╰→  Desktop |
```

16. Change permissions of `myscript.sh` to make it executable by owner, group, and others:

```
Desktop chmod +x web_scraper.sh

Desktop
```

17. Recursively make all files readable in a directory (say `dir_name`):

```
Desktop chmod -R a+r ./Codeforces

Desktop
```

18. List all files that end with `.log` in a directory:

```
Desktop ls *.log

errors.log
Desktop
```

19. Command to get the kernel version:

```
→   Desktop uname -r

24.5.0
→   Desktop
```

20. Find the IP address of the system:

```
→   Desktop hostname -I

hostname: illegal option -- I
usage: hostname [-f] [-s | -d] [name-of-host]
→   Desktop |
```

21. List all files and directories in current directory sorted by size:

```
→   Desktop ls -lS

total 28456
-rw-------@  1 anshu  staff  6478443 Apr 29 13:07 Atomic_Habits_by_James_Clear-1
.pdf
-rw-r--r--@  1 anshu  staff  3999207 May 21 21:39 P2.pdf
-rw-r--r--@  1 anshu  staff  2220752 May 21 21:38 P1.pdf
-rw-r--r--@  1 anshu  staff   908255 May 21 22:30 Cancled_cheque_hdfc.pdf
-rw-r--r--@  1 anshu  staff   695518 May 21 20:12 DecleartionForm.pdf
-rw-r--r--   1 anshu  staff   231098 May 28 23:37 file.txt
-rw-r--r--@  1 anshu  staff     4547 May 29 23:14 new_log.txt
-rwxr-xr-x@  1 anshu  staff     2053 May 28 23:07 web_scraper.sh
drwxr-xr-x  28 anshu  staff      896 May 17 00:09 All Files
drwxr-xr-x  18 anshu  staff      576 May 19 20:34 Kirshworks
-rw-r--r--   1 anshu  staff      544 May 29 23:15 errors.log
drwxr-xr-x@ 10 anshu  staff      320 May 26 00:10 BounteousTrainging
drwxr-xr-x@  9 anshu  staff      288 Mar 18 20:41 cSharp
drwxr-xr-x   7 anshu  staff      224 May 25 23:47 Codeforces
-rw-r--r--   1 anshu  staff      220 May 29 23:24 google_homepage.html
-rw-r--r--@  1 anshu  staff      170 May 29 23:23 Test.sh
-rw-r--r--   1 anshu  staff        0 May 28 23:01 eb_scraper.sh
-r--r--r--   1 anshu  staff        0 May 29 23:25 example.txt
-rw-r--r--   1 anshu  staff        0 May 29 23:24 google_ping_output.txt
→   Desktop
```

22. List all files and directories with sizes in human-readable format:

```
↳   Desktop ls -lh

total 28456
drwxr-xr-x  28 anshu   staff     896B May 17 00:09 All Files
-rw-------@  1 anshu   staff     6.2M Apr 29 13:07 Atomic_Habits_by_James_Clear-1.p
df
drwxr-xr-x@ 10 anshu   staff     320B May 26 00:10 BounteousTrainging
-rw-r--r--@  1 anshu   staff     887K May 21 22:30 Cancled_cheque_hdfc.pdf
drwxr-xr-x   7 anshu   staff     224B May 25 23:47 Codeforces
drwxr-xr-x@  9 anshu   staff     288B Mar 18 20:41 cSharp
-rw-r--r--@  1 anshu   staff     679K May 21 20:12 DecleartionForm.pdf
-rw-r--r--   1 anshu   staff       0B May 28 23:01 eb_scraper.sh
-rw-r--r--   1 anshu   staff     544B May 29 23:15 errors.log
-r--r--r--   1 anshu   staff       0B May 29 23:25 example.txt
-rw-r--r--   1 anshu   staff     226K May 28 23:37 file.txt
-rw-r--r--   1 anshu   staff     220B May 29 23:24 google_homepage.html
-rw-r--r--   1 anshu   staff       0B May 29 23:24 google_ping_output.txt
drwxr-xr-x  18 anshu   staff     576B May 19 20:34 Kirshworks
-rw-r--r--@  1 anshu   staff     4.4K May 29 23:14 new_log.txt
-rw-r--r--@  1 anshu   staff     2.1M May 21 21:38 P1.pdf
-rw-r--r--@  1 anshu   staff     3.8M May 21 21:39 P2.pdf
-rw-r--r--@  1 anshu   staff     170B May 29 23:23 Test.sh
-rwxr-xr-x@  1 anshu   staff     2.0K May 28 23:07 web_scraper.sh
↳   Desktop |
```

23. Print the hostname of the computer:

```
↳   Desktop hostname

ANSHUs--MacBook-Air.local
↳   Desktop |
```

24. Command to kill a particular process by PID:

```
⟩→  Desktop ps -a
  PID TTY              TIME CMD
 2914 ttys000      0:00.01 login -fp anshu
 2915 ttys000      0:01.04 -zsh
 4536 ttys000      0:00.01 ps -a
⟩→  Desktop kill 2915
⟩→  Desktop
```

25. Create two files `test1.txt` and `test2.txt` with content, then merge into `test.txt` :

```
⟩→  Desktop echo "Content for test1" > test1.txt
echo "Content for test2" > test2.txt
cat test1.txt test2.txt > test.txt

⟩→  Desktop
```

26. Create a shell script `test.sh` with given content and execute it:

```
 ↳  Desktop echo 'num_processes=10
for ((i=1; i<=num_processes; i++))
do
     (sleep 60) &
     echo "Created process with PID: $!"
done' > test.sh

chmod +x test.sh
./test.sh

Created process with PID: 4707
Created process with PID: 4708
Created process with PID: 4709
Created process with PID: 4710
Created process with PID: 4711
Created process with PID: 4712
Created process with PID: 4713
Created process with PID: 4714
Created process with PID: 4715
Created process with PID: 4716
 ↳  Desktop
```

27. Command to kill specific processes with given PID(s) (e.g., PID 1234, 5678):

```
 ↳  Desktop kill 1234 5678

kill: kill 1234 failed: no such process
kill: kill 5678 failed: no such process
 ↳  Desktop |
```

28. Write a shell script that takes your name as input and displays "Hello your_name":

```
Desktop echo -n "Enter your name: "
read name
echo "Hello $name"

Enter your name: Anshu
Hello Anshu
Desktop
```

29. Download `file.zip` from the given URL:

```
Desktop wget https://github.com/github/gitignore/archive/refs/heads/main.zip
-O file.zip

--2025-05-29 23:36:09--  https://github.com/github/gitignore/archive/refs/heads/
main.zip
Resolving github.com (github.com)... 20.207.73.82
Connecting to github.com (github.com)|20.207.73.82|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://codeload.github.com/github/gitignore/zip/refs/heads/main [foll
owing]
--2025-05-29 23:36:09--  https://codeload.github.com/github/gitignore/zip/refs/h
eads/main
Resolving codeload.github.com (codeload.github.com)... 20.207.73.88
Connecting to codeload.github.com (codeload.github.com)|20.207.73.88|:443... con
nected.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [application/zip]
Saving to: 'file.zip'

file.zip                [ <=>                    ] 122.03K  --.-KB/s    in 0.07s

2025-05-29 23:36:10 (1.70 MB/s) - 'file.zip' saved [124956]

Desktop
```

30. Zip `test.txt` to `test.zip` and unzip it:

```
⊢→  Desktop zip test.zip test.txt
unzip test.zip

  adding: test.txt (deflated 31%)
Archive:  test.zip
replace test.txt? [y]es, [n]o, [A]ll, [N]one, [r]ename: y
  inflating: test.txt
⊢→  Desktop
```