**Q1. Adam is working in an IT company. He has been given a task to reduce the load of a system by killing some of the processes running in the LINUX operating system. Which commands will he use to complete the given task with the help of the following operation?**

ps -e

```
Installing, this may take a few minutes...
Please create a default UNIX user account. The username does not need to match your Windows username.
For more information visit: https://aka.ms/wslusers
Enter new UNIX username: ishika
New password:
Retype new password:
passwd: password updated successfully
Installation successful!
Windows Subsystem for Linux is now available in the Microsoft Store!
You can upgrade by running 'wsl.exe --update' or by visiting https://aka.ms/wslstorepage
Installing WSL from the Microsoft Store will give you the latest WSL updates, faster.
For more information please visit https://aka.ms/wslstoreinfo

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 4.4.0-19041-Microsoft x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro

 System information as of Mon Feb  2 16:30:04 UTC 2026

  System load:    0.52       Processes:              8
  Usage of /home: unknown    Users logged in:        0
  Memory usage:   84%        IPv4 address for wifi0: 192.168.1.8
  Swap usage:     1%

This message is shown once a day. To disable it please create the
/home/ishika/.hushlogin file.
ishika@DESKTOP-MF8PUSJ:~$ ps -e
  PID TTY          TIME CMD
    1 ?        00:00:00 init
   58 tty1     00:00:00 init
   59 tty1     00:00:00 bash
  108 tty1     00:00:00 ps
ishika@DESKTOP-MF8PUSJ:~$ _
```

- **Kill processes by name**

**Command : killall bash**

```
ishika@DESKTOP-MF8PUSJ:~$ killall bash
ishika@DESKTOP-MF8PUSJ:~$
```

- **Kill a process based on the process name**

**Command : pkill bash**

```
 108 tty1     00:00:00 ps
ishika@DESKTOP-MF8PUSJ:~$ killall bash
ishika@DESKTOP-MF8PUSJ:~$ pkill bash
ishika@DESKTOP-MF8PUSJ:~$ _
```

- **Kill a single process at a time with the given process ID**

**Command : ps-e , kill 59**

```
/nome/ishika/.bashlogin-file:
ishika@DESKTOP-MF8PUSJ:~$ ps -e
  PID TTY          TIME CMD
    1 ?        00:00:00 init
   58 tty1     00:00:00 init
   59 tty1     00:00:00 bash
  108 tty1     00:00:00 ps
ishika@DESKTOP-MF8PUSJ:~$ killall bash
ishika@DESKTOP-MF8PUSJ:~$ pkill bash
ishika@DESKTOP-MF8PUSJ:~$ ps -e
  PID TTY          TIME CMD
    1 ?        00:00:00 init
   58 tty1     00:00:00 init
   59 tty1     00:00:00 bash
  111 tty1     00:00:00 ps
ishika@DESKTOP-MF8PUSJ:~$ ps -e
  PID TTY          TIME CMD
    1 ?        00:00:00 init
   58 tty1     00:00:00 init
   59 tty1     00:00:00 bash
  112 tty1     00:00:00 ps
ishika@DESKTOP-MF8PUSJ:~$ kill 59
ishika@DESKTOP-MF8PUSJ:~$
```

**Q2. Write a program for process creation using C**

- **Orphan Process**

```
  GNU nano 7.2
#include <stdio.h>
#include <unistd.h>

int main() {
    if (fork() > 0) {
        printf("Parent exiting\n");
    } else {
        sleep(5);
        printf("Child running\n");
    }
    return 0;
}
```

```
ishika@DESKTOP-MF8PUSJ:~$ nano orphan.c
ishika@DESKTOP-MF8PUSJ:~$ gcc orphan.c
ishika@DESKTOP-MF8PUSJ:~$ ./a.out
Parent exiting
ishika@DESKTOP-MF8PUSJ:~$ Child running
```

- **Zombie Process**

```
  GNU nano 7.2
#include <stdio.h>
#include <unistd.h>

int main() {
    if (fork() == 0) {
        printf("Child process exiting\n");
    } else {
        sleep(10);
        printf("Parent process running\n");
    }
    return 0;
}
```

```
sudo apt install gcc
ishika@DESKTOP-MF8PUSJ:~$ gcc fork.c./a.out
Command 'gcc' not found, but can be installed with:
sudo apt install gcc
ishika@DESKTOP-MF8PUSJ:~$ sudo apt update
[sudo] password for ishika:
Get:1 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Hit:2 http://archive.ubuntu.com/ubuntu noble InRelease
Get:3 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:5 http://archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]
Get:6 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [1410 kB]
Get:7 http://archive.ubuntu.com/ubuntu noble/universe Translation-en [5982 kB]
Get:8 http://archive.ubuntu.com/ubuntu noble/universe amd64 Components [3871 kB]
Get:9 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [230 kB]
Get:10 http://archive.ubuntu.com/ubuntu noble/universe amd64 c-n-f Metadata [301 kB]
Get:11 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [21.5 kB]
Get:12 http://archive.ubuntu.com/ubuntu noble/multiverse amd64 Packages [269 kB]
Get:13 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [9820 B]
Get:14 http://archive.ubuntu.com/ubuntu noble/multiverse Translation-en [118 kB]
Get:15 http://archive.ubuntu.com/ubuntu noble/multiverse amd64 Components [35.0 kB]
Get:16 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [929 kB]
Get:17 http://archive.ubuntu.com/ubuntu noble/multiverse amd64 c-n-f Metadata [8328 B]
Get:18 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [1720 kB]
Get:19 http://archive.ubuntu.com/ubuntu noble-updates/main Translation-en [317 kB]
Get:20 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [175 kB]
Get:21 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 c-n-f Metadata [16.0 kB]
Get:22 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [1525 kB]
Get:23 http://archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [312 kB]
Get:24 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [212 kB]
Get:25 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [386 kB]
Get:26 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [74.3 kB]
Get:27 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [31.8 kB]
Get:28 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [19.8 kB]
Get:29 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [2547 kB]
Get:30 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [2369 kB]
Get:31 http://archive.ubuntu.com/ubuntu noble-updates/restricted Translation-en [583 kB]
Get:32 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 B]
Get:33 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 c-n-f Metadata [556 B]
Get:34 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [32.1 kB]
Get:35 http://archive.ubuntu.com/ubuntu noble-updates/multiverse Translation-en [6816 B]
Get:36 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B]
Get:37 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 c-n-f Metadata [496 B]
Get:38 http://archive.ubuntu.com/ubuntu noble-backports/main amd64 Packages [40.4 kB]
```

```
ishika@DESKTOP-MF8PUSJ:~$ sudo apt install build-essential
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
```

```
ishika@DESKTOP-MF8PUSJ:~$ ls
fork.c  zombie.c
ishika@DESKTOP-MF8PUSJ:~$ gcc zombie.c
ishika@DESKTOP-MF8PUSJ:~$ ./a.out
Child process exiting
Parent process running
ishika@DESKTOP-MF8PUSJ:~$
```

**Q3. Create the process using fork () system call.**

- **Child Process creation**

```
  GNU nano 7.2
#include <stdio.h>
#include <unistd.h>

int main() {
    if (fork() == 0) {
        printf("Child process exiting\n");
    } else {
        sleep(10);
        printf("Parent process running\n");
    }
    return 0;
}
```

- **Parent process creation**

```
ishika@DESKTOP-MF8PUSJ:~$ nano fork.c
ishika@DESKTOP-MF8PUSJ:~$ gcc fork.c
ishika@DESKTOP-MF8PUSJ:~$ ./a.out
Child process exiting
Parent process running
ishika@DESKTOP-MF8PUSJ:~$
```

- **PPID & PID**

```
ishika@DESKTOP-MF8PUSJ:~$ nano fork.c
ishika@DESKTOP-MF8PUSJ:~$ gcc fork.c
ishika@DESKTOP-MF8PUSJ:~$ ./a.out
Child process exiting
Parent process running
ishika@DESKTOP-MF8PUSJ:~$ nano fork.c
ishika@DESKTOP-MF8PUSJ:~$ gcc fork.c
ishika@DESKTOP-MF8PUSJ:~$ ./a.out
```