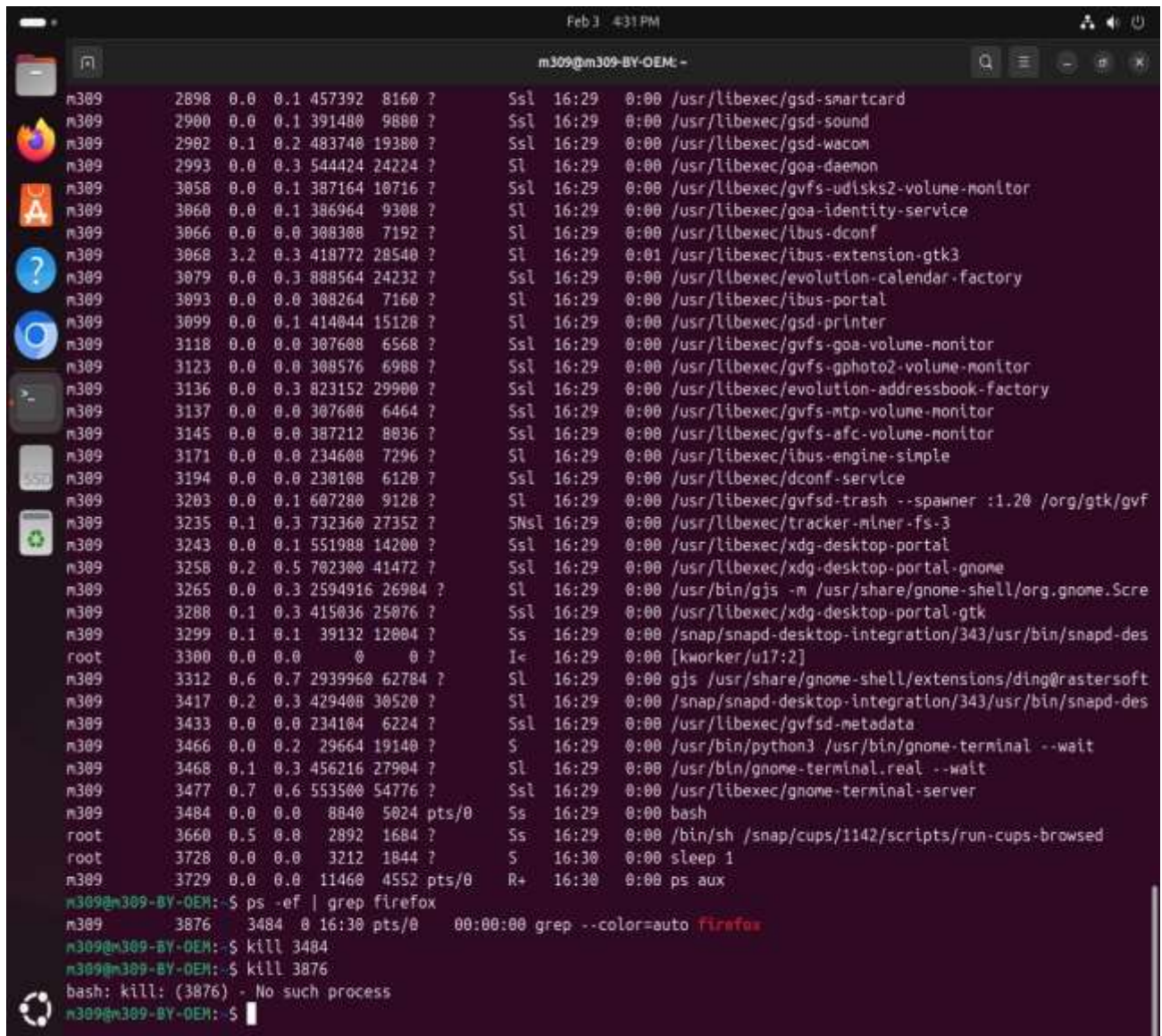


PRACTICAL4

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?

- Kill Processes by name



```
m309@m309-BY-OEM: -
Feb 3 4:31 PM
m309 2898 0.0 0.1 457392 8160 ? Ssl 16:29 0:00 /usr/libexec/gsd-smartcard
m309 2900 0.0 0.1 391480 9880 ? Ssl 16:29 0:00 /usr/libexec/gsd-sound
m309 2902 0.1 0.2 483740 19380 ? Ssl 16:29 0:00 /usr/libexec/gsd-wacom
m309 2993 0.0 0.3 544424 24224 ? Sl 16:29 0:00 /usr/libexec/goa-daemon
m309 3058 0.0 0.1 387164 10716 ? Ssl 16:29 0:00 /usr/libexec/gvfs-udisks2-volume-monitor
m309 3060 0.0 0.1 386964 9300 ? Sl 16:29 0:00 /usr/libexec/goa-identity-service
m309 3066 0.0 0.0 308308 7192 ? Sl 16:29 0:00 /usr/libexec/ibus-dconf
m309 3068 3.2 0.3 418772 28540 ? Sl 16:29 0:01 /usr/libexec/ibus-extension-gtk3
m309 3079 0.0 0.3 888564 24232 ? Ssl 16:29 0:00 /usr/libexec/evolution-calendar-factory
m309 3093 0.0 0.0 308264 7160 ? Sl 16:29 0:00 /usr/libexec/ibus-portal
m309 3099 0.0 0.1 414044 15120 ? Sl 16:29 0:00 /usr/libexec/gsd-printer
m309 3118 0.0 0.0 307608 6560 ? Ssl 16:29 0:00 /usr/libexec/gvfs-goa-volume-monitor
m309 3123 0.0 0.0 308576 6980 ? Ssl 16:29 0:00 /usr/libexec/gvfs-gphoto2-volume-monitor
m309 3136 0.0 0.3 823152 29900 ? Ssl 16:29 0:00 /usr/libexec/evolution-addressbook-factory
m309 3137 0.0 0.0 307608 6464 ? Ssl 16:29 0:00 /usr/libexec/gvfs-mtp-volume-monitor
m309 3145 0.0 0.0 387212 8036 ? Ssl 16:29 0:00 /usr/libexec/gvfs-afc-volume-monitor
m309 3171 0.0 0.0 234608 7296 ? Sl 16:29 0:00 /usr/libexec/ibus-engine-simple
m309 3194 0.0 0.0 230108 6120 ? Ssl 16:29 0:00 /usr/libexec/dconf-service
m309 3203 0.0 0.1 607280 9120 ? Sl 16:29 0:00 /usr/libexec/gvfsd-trash --spawned :1.20 /org/gtk/gvf
m309 3235 0.1 0.3 732360 27352 ? Ssl 16:29 0:00 /usr/libexec/tracker-miner-fs-3
m309 3243 0.0 0.1 551988 14200 ? Ssl 16:29 0:00 /usr/libexec/xdg-desktop-portal
m309 3258 0.2 0.5 702300 41472 ? Ssl 16:29 0:00 /usr/libexec/xdg-desktop-portal-gnome
m309 3265 0.0 0.3 2594916 26904 ? Sl 16:29 0:00 /usr/bin/gjs -m /usr/share/gnome-shell/org.gnome.Scre
m309 3288 0.1 0.3 415036 25076 ? Ssl 16:29 0:00 /usr/libexec/xdg-desktop-portal-gtk
m309 3299 0.1 0.1 39132 12004 ? Ss 16:29 0:00 /snap/snapd-desktop-integration/343/usr/bin/snapd-des
root 3300 0.0 0.0 0 0 ? I< 16:29 0:00 [kworker/u17:2]
m309 3312 0.6 0.7 2939960 62784 ? Sl 16:29 0:00 gjs /usr/share/gnome-shell/extensions/ding@rastersoft
m309 3417 0.2 0.3 429408 30520 ? Sl 16:29 0:00 /snap/snapd-desktop-integration/343/usr/bin/snapd-des
m309 3433 0.0 0.0 234104 6224 ? Ssl 16:29 0:00 /usr/libexec/gvfsd-metadata
m309 3466 0.0 0.2 29664 19140 ? S 16:29 0:00 /usr/bin/python3 /usr/bin/gnome-terminal --wait
m309 3468 0.1 0.3 456216 27904 ? Sl 16:29 0:00 /usr/bin/gnome-terminal.real --wait
m309 3477 0.7 0.6 553500 54776 ? Ssl 16:29 0:00 /usr/libexec/gnome-terminal-server
m309 3484 0.0 0.0 8840 5024 pts/0 Ss 16:29 0:00 bash
root 3660 0.5 0.0 2892 1684 ? Ss 16:29 0:00 /bin/sh /snap/cups/1142/scripts/run-cups-browsed
root 3720 0.0 0.0 3212 1844 ? S 16:30 0:00 sleep 1
m309 3729 0.0 0.0 11460 4552 pts/0 R+ 16:30 0:00 ps aux
m309@m309-BY-OEM: $ ps -ef | grep firefox
m309 3876 3484 0 16:30 pts/0 00:00:00 grep --color=auto firefox
m309@m309-BY-OEM: $ kill 3484
m309@m309-BY-OEM: $ kill 3876
bash: kill: (3876) - No such process
m309@m309-BY-OEM: $
```

- Kill a process based on the process name

```

Feb 3 4:23 PM
n309@n309-BY-DEMI:~$ ps -ef | grep firefox
n309 2980 0.0 0.1 391488 9888 ? Ssl 16:29 0:00 /usr/libexec/gsd-sound
n309 2982 0.0 0.2 483740 19388 ? Ssl 16:29 0:00 /usr/libexec/gsd-wacom
n309 2993 0.0 0.3 544424 24224 ? Sl 16:29 0:00 /usr/libexec/goa-daemon
n309 3058 0.0 0.1 387164 18716 ? Ssl 16:29 0:00 /usr/libexec/gvfs-udisks2-volume-monitor
n309 3060 0.0 0.1 386964 9308 ? Sl 16:29 0:00 /usr/libexec/goa-identity-service
n309 3066 0.0 0.0 388308 7192 ? Sl 16:29 0:00 /usr/libexec/ibus-dconf
n309 3068 1.1 0.3 418772 28548 ? Sl 16:29 0:01 /usr/libexec/ibus-extension-gtk3
n309 3079 0.0 0.3 888564 24232 ? Ssl 16:29 0:00 /usr/libexec/evolution-calendar-factory
n309 3093 0.0 0.0 388264 7160 ? Sl 16:29 0:00 /usr/libexec/ibus-portal
n309 3099 0.0 0.1 414044 15128 ? Sl 16:29 0:00 /usr/libexec/gsd-printer
n309 3110 0.0 0.0 387608 6568 ? Ssl 16:29 0:00 /usr/libexec/gvfs-goa-volume-monitor
n309 3123 0.0 0.0 388576 6988 ? Ssl 16:29 0:00 /usr/libexec/gvfs-gphoto2-volume-monitor
n309 3136 0.0 0.3 823152 29908 ? Ssl 16:29 0:00 /usr/libexec/evolution-addressbook-factory
n309 3137 0.0 0.0 387608 6464 ? Ssl 16:29 0:00 /usr/libexec/gvfs-ntp-volume-monitor
n309 3145 0.0 0.0 387212 8836 ? Ssl 16:29 0:00 /usr/libexec/gvfs-afc-volume-monitor
n309 3171 0.0 0.0 234608 7324 ? Sl 16:29 0:00 /usr/libexec/ibus-engine-simple
n309 3194 0.0 0.0 238188 6128 ? Ssl 16:29 0:00 /usr/libexec/dconf-service
n309 3203 0.0 0.1 687280 9128 ? Sl 16:29 0:00 /usr/libexec/gvfsd-trash --spawner :1.28 /org/gtk/gvf
n309 3235 0.1 0.4 886584 34932 ? Ssl 16:29 0:00 /usr/libexec/tracker-miner-fs-3
n309 3243 0.0 0.1 699452 14228 ? Ssl 16:29 0:00 /usr/libexec/xdg-desktop-portal
n309 3250 0.1 0.5 782300 41476 ? Ssl 16:29 0:00 /usr/libexec/xdg-desktop-portal-gnome
n309 3265 0.0 0.3 2594916 26984 ? Sl 16:29 0:00 /usr/bin/gjs -n /usr/share/gnome-shell/org.gnome.Scre
n309 3280 0.0 0.3 415036 25808 ? Ssl 16:29 0:00 /usr/libexec/xdg-desktop-portal-gtk
n309 3299 0.0 0.1 39132 12884 ? Ss 16:29 0:00 /snap/snapd-desktop-integration/343/usr/bin/snapd-des
root 3380 0.0 0.0 0 0 ? I+ 16:29 0:00 [kworker/u17:2]
n309 3312 0.2 0.7 2939960 62908 ? Sl 16:29 0:00 gjs /usr/share/gnome-shell/extensions/ding@rastersoft
n309 3417 0.0 0.3 429408 38528 ? Sl 16:29 0:00 /snap/snapd-desktop-integration/343/usr/bin/snapd-des
n309 3433 0.0 0.0 234108 6336 ? Ssl 16:29 0:00 /usr/libexec/gvfsd-metadata
n309 3466 0.0 0.2 29664 19148 ? S 16:29 0:00 /usr/bin/python3 /usr/bin/gnome-terminal --wait
n309 3468 0.0 0.3 456216 27984 ? Sl 16:29 0:00 /usr/bin/gnome-terminal.real --wait
n309 3477 0.7 0.6 554604 55548 ? Ssl 16:29 0:00 /usr/libexec/gnome-terminal-server
n309 3484 0.0 0.0 8840 5824 pts/0 Ss 16:29 0:00 bash
n309 3739 0.1 0.3 565976 38892 ? Sl 16:30 0:00 /usr/bin/update-notifier
root 3940 0.2 0.0 2892 1888 ? Ss 16:30 0:00 /bin/sh /snap/cups/1142/scripts/run-cups-browsed
n309 4075 0.9 0.3 472128 38392 ? SNI 16:31 0:00 /usr/libexec/tracker-extract-3 --socket-fd 3
root 4093 0.0 0.0 3212 1976 ? S 16:31 0:00 sleep 1
n309 4094 0.0 0.0 11460 4552 pts/0 R+ 16:31 0:00 ps aux

n309@n309-BY-DEMI:~$ ps -ef | grep firefox
n309 4166 3484 0 16:31 pts/0 00:00:00 grep --color=auto firefox

n309@n309-BY-DEMI:~$ killall firefox
Firefox: no process found
n309@n309-BY-DEMI:~$

```

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

```

Feb 3 4:23 PM
n309@n309-BY-DEMI:~$ ps -ef | grep chrome
n309 2980 0.0 0.1 391488 9888 ? Ssl 16:29 0:00 /usr/libexec/gsd-smartcard
n309 2982 0.0 0.2 483740 19388 ? Ssl 16:29 0:00 /usr/libexec/gsd-sound
n309 2993 0.0 0.3 544424 24224 ? Sl 16:29 0:00 /usr/libexec/goa-daemon
n309 3058 0.0 0.1 387164 18716 ? Ssl 16:29 0:00 /usr/libexec/gvfs-udisks2-volume-monitor
n309 3060 0.0 0.1 386964 9308 ? Sl 16:29 0:00 /usr/libexec/goa-identity-service
n309 3066 0.0 0.0 388308 7192 ? Sl 16:29 0:00 /usr/libexec/ibus-dconf
n309 3068 0.7 0.3 418772 28544 ? Sl 16:29 0:01 /usr/libexec/ibus-extension-gtk3
n309 3079 0.0 0.3 888564 24232 ? Ssl 16:29 0:00 /usr/libexec/evolution-calendar-factory
n309 3093 0.0 0.0 388264 7160 ? Sl 16:29 0:00 /usr/libexec/ibus-portal
n309 3099 0.0 0.1 414044 15128 ? Sl 16:29 0:00 /usr/libexec/gsd-printer
n309 3110 0.0 0.0 387608 6568 ? Ssl 16:29 0:00 /usr/libexec/gvfs-goa-volume-monitor
n309 3123 0.0 0.0 388576 6988 ? Ssl 16:29 0:00 /usr/libexec/gvfs-gphoto2-volume-monitor
n309 3136 0.0 0.3 823152 29908 ? Ssl 16:29 0:00 /usr/libexec/evolution-addressbook-factory
n309 3137 0.0 0.0 387608 6464 ? Ssl 16:29 0:00 /usr/libexec/gvfs-ntp-volume-monitor
n309 3145 0.0 0.0 387212 8836 ? Ssl 16:29 0:00 /usr/libexec/gvfs-afc-volume-monitor
n309 3171 0.0 0.0 234608 7324 ? Sl 16:29 0:00 /usr/libexec/ibus-engine-simple
n309 3194 0.0 0.0 238188 6128 ? Ssl 16:29 0:00 /usr/libexec/dconf-service
n309 3203 0.0 0.1 687280 9128 ? Sl 16:29 0:00 /usr/libexec/gvfsd-trash --spawner :1.28 /org/gtk/gvf
n309 3235 0.0 0.3 886552 31908 ? SNI 16:29 0:00 /usr/libexec/tracker-miner-fs-3
n309 3243 0.0 0.1 699452 14228 ? Ssl 16:29 0:00 /usr/libexec/xdg-desktop-portal
n309 3250 0.0 0.5 782300 41476 ? Ssl 16:29 0:00 /usr/libexec/xdg-desktop-portal-gnome
n309 3265 0.0 0.3 2594916 26984 ? Sl 16:29 0:00 /usr/bin/gjs -n /usr/share/gnome-shell/org.gnome.Scre
n309 3280 0.0 0.3 415036 25808 ? Ssl 16:29 0:00 /usr/libexec/xdg-desktop-portal-gtk
n309 3299 0.0 0.1 39132 12884 ? Ss 16:29 0:00 /snap/snapd-desktop-integration/343/usr/bin/snapd-des
root 3380 0.0 0.0 0 0 ? I+ 16:29 0:00 [kworker/u17:2]
n309 3312 0.1 0.7 2939960 62908 ? Sl 16:29 0:00 gjs /usr/share/gnome-shell/extensions/ding@rastersoft
n309 3417 0.0 0.3 429408 38528 ? Sl 16:29 0:00 /snap/snapd-desktop-integration/343/usr/bin/snapd-des
n309 3433 0.0 0.0 234108 6336 ? Ssl 16:29 0:00 /usr/libexec/gvfsd-metadata
n309 3466 0.0 0.2 29664 19148 ? S 16:29 0:00 /usr/bin/python3 /usr/bin/gnome-terminal --wait
n309 3468 0.0 0.3 456216 27984 ? Sl 16:29 0:00 /usr/bin/gnome-terminal.real --wait
n309 3477 0.6 0.6 554604 55548 ? Ssl 16:29 0:01 /usr/libexec/gnome-terminal-server
n309 3484 0.0 0.0 8840 5824 pts/0 Ss 16:29 0:00 bash
n309 3739 0.1 0.3 565976 38892 ? Sl 16:30 0:00 /usr/bin/update-notifier
root 4480 0.2 0.0 2892 1812 ? Ss 16:32 0:00 /bin/sh /snap/cups/1142/scripts/run-cups-browsed
root 4532 0.0 0.0 3212 2812 ? S 16:33 0:00 sleep 1
n309 4533 0.0 0.0 11460 4536 pts/0 R+ 16:33 0:00 ps aux

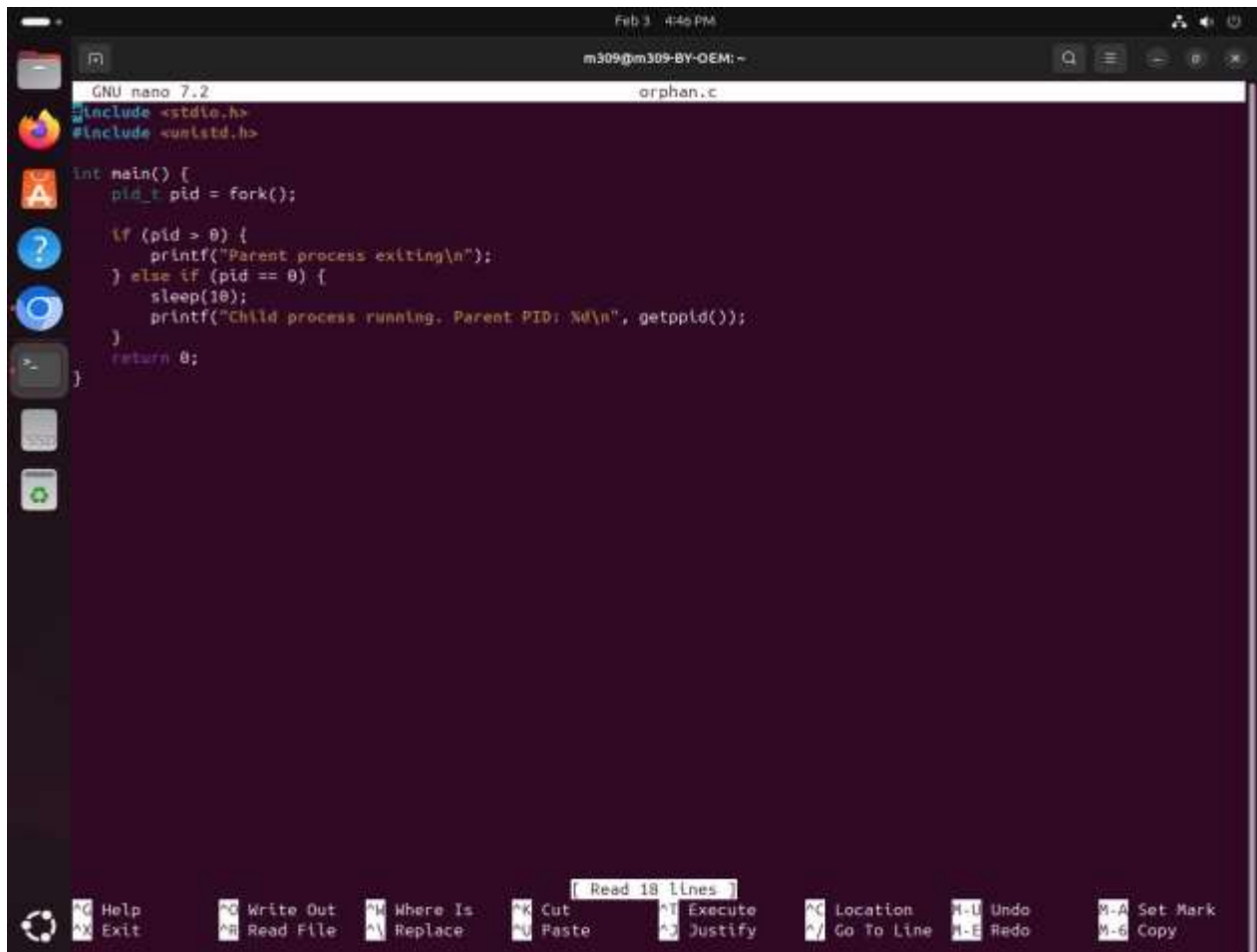
n309@n309-BY-DEMI:~$ ps aux | grep chrome
n309 4692 0.0 0.0 7884 2176 pts/0 S+ 16:34 0:00 grep --color=auto chrome

n309@n309-BY-DEMI:~$ kill 4692
bash: kill: (4692) - No such process
n309@n309-BY-DEMI:~$

```


2. Write a program for process creation using C

- Orphan Process



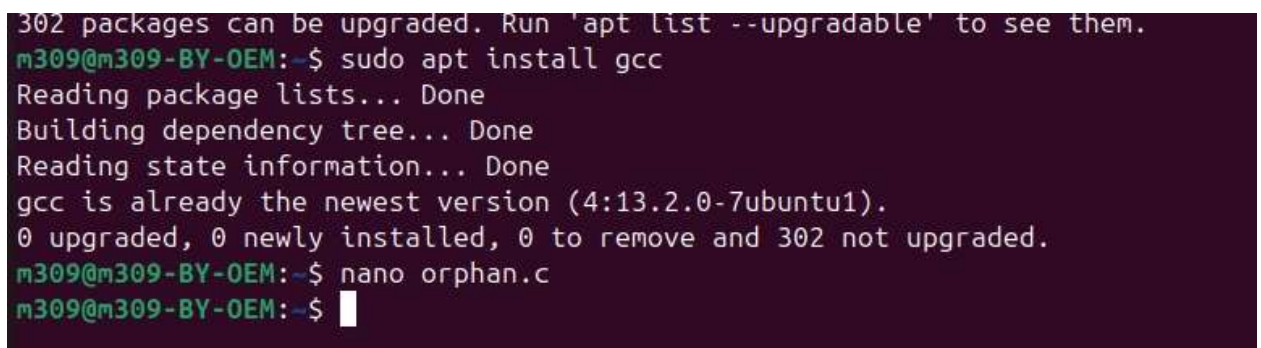
```
GNU nano 7.2 orphan.c
#include <stdio.h>
#include <unistd.h>

int main() {
    pid_t pid = fork();

    if (pid > 0) {
        printf("Parent process exiting\n");
    } else if (pid == 0) {
        sleep(10);
        printf("Child process running. Parent PID: %d\n", getppid());
    }

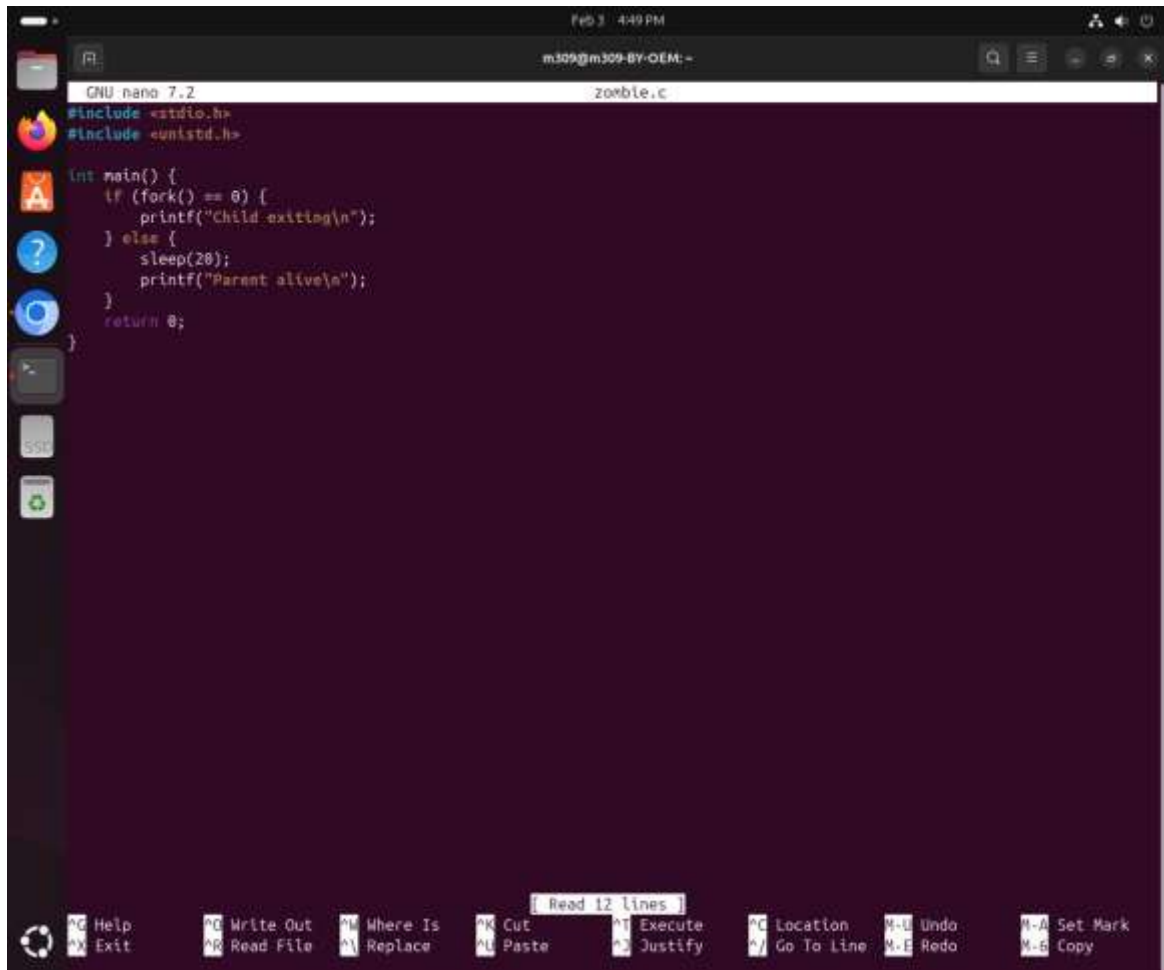
    return 0;
}
```

Output:



```
302 packages can be upgraded. Run 'apt list --upgradable' to see them.
m309@m309-BY-OEM:~$ sudo apt install gcc
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
gcc is already the newest version (4:13.2.0-7ubuntu1).
0 upgraded, 0 newly installed, 0 to remove and 302 not upgraded.
m309@m309-BY-OEM:~$ nano orphan.c
m309@m309-BY-OEM:~$
```

- **Zombie Process**



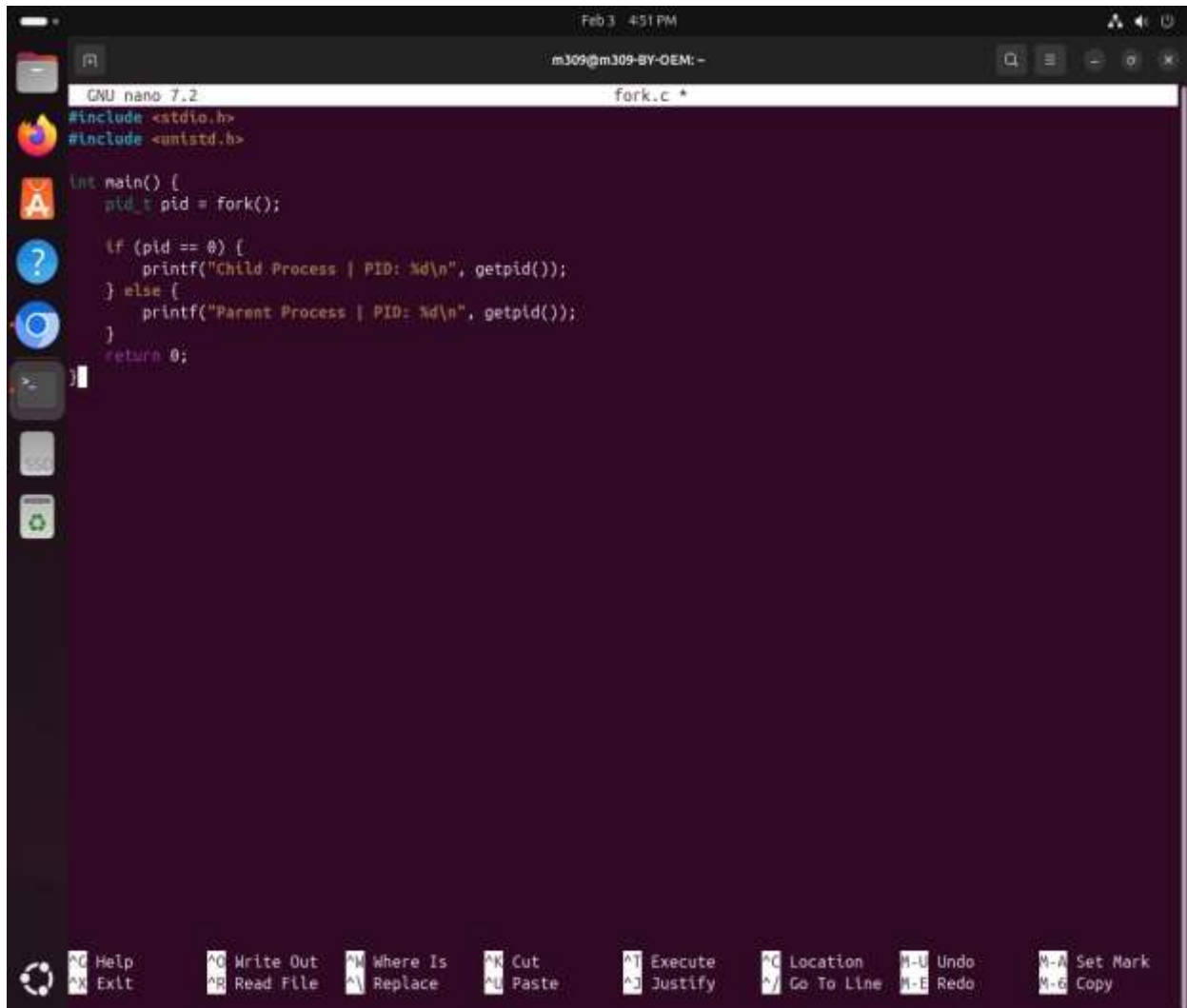
Output:

```
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
gcc is already the newest version (4:13.2.0-7ubuntu1).
0 upgraded, 0 newly installed, 0 to remove and 302 not upgraded.
m309@m309-BY-OEM:~$ nano orphan.c
m309@m309-BY-OEM:~$ nano orphan.c
m309@m309-BY-OEM:~$ nano zombie.c
m309@m309-BY-OEM:~$
```

```
n309@n309-BY-OEM: $ nano zombie.c
n309@n309-BY-OEM: $ ps -ef | grep z
n309      8223   8146  @ 16:43 ?        00:00:00 /snap/chronium/3125/usr/lib/chronium-browser/chrome --type=zygote --
no-zygote-sandbox --crashpad-handler-pid=8217 --enable-crash-reporter=snap --change-stack-guard-on-fork=enable
n309      8224   8146  @ 16:43 ?        00:00:00 /snap/chronium/3125/usr/lib/chronium-browser/chrome --type=zygote --
crashpad-handler-pid=8217 --enable-crash-reporter=snap --change-stack-guard-on-fork=enable
n309      8226   8224  @ 16:43 ?        00:00:00 /snap/chronium/3125/usr/lib/chronium-browser/chrome --type=zygote --
crashpad-handler-pid=8217 --enable-crash-reporter=snap --change-stack-guard-on-fork=enable
n309      10071  3484  @ 16:50 pts/0    00:00:00 grep --color=auto z
n309@n309-BY-OEM: $
```

3. Create the process using fork ()system call

- Child Process creation
- Parent Process creation PPID and PID



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

int main() {
    pid_t pid = fork();

    if (pid == 0) {
        printf("Child Process | PID: %d\n", getpid());
    } else {
        printf("Parent Process | PID: %d\n", getpid());
    }

    return 0;
}
```

```
m309      8223   8146  0 16:43 ?        00:00:00 /snap/chromium/3125/usr/lib/chromium-browser/chrome --type=zygote --
no-zygote-sandbox --crashpad-handler-pid=8217 --enable-crash-reporter=snap --change-stack-guard-on-fork=enable
m309      8224   8146  0 16:43 ?        00:00:00 /snap/chromium/3125/usr/lib/chromium-browser/chrome --type=zygote --
crashpad-handler-pid=8217 --enable-crash-reporter=snap --change-stack-guard-on-fork=enable
m309      8226   8224  0 16:43 ?        00:00:00 /snap/chromium/3125/usr/lib/chromium-browser/chrome --type=zygote --
crashpad-handler-pid=8217 --enable-crash-reporter=snap --change-stack-guard-on-fork=enable
m309     10071   3484  0 16:50 pts/0    00:00:00 grep --color=auto z
m309@m309-BY-OEM:~$ nano fork.c
m309@m309-BY-OEM:~$ nano fork.c
m309@m309-BY-OEM:~$
```