

OPERATING SYSTEM

PROGRAMMING EXERCISE -1

Write a program to create a child process which lists all the executing user process (avoid creation of zombie process)

Code:

```
#include <stdio.h>
#include <unistd.h>
#include <sys/wait.h>

int main() {
    pid_t pid = fork();
    if (pid == 0) {
        // Child process
        execlp("ps", "ps", "-ef", NULL);
    } else {
        // Parent process
        waitpid(pid, NULL, 0);
    }
    return 0;
}
```

```
#include<stdio.h>
#include<unistd.h>
#include<sys/wait.h>

int main(){

pid_t pid =fork();
if(pid==0){
//child process
execlp("ps","ps","-ef",NULL);

}

else{
//parent process

waitpid(pid,NULL,0);

}

return 0;

}
```

OUTPUT

```
nagavenigowda@Ubuntu: ~  
nagavenigowda@Ubuntu:~$ gcc os_1.c  
nagavenigowda@Ubuntu:~$ ./a.out  
UID      PID    PPID  C  STIME TTY      TIME CMD  
root      1      0    0  18:33 ?        00:00:01 /sbin/init splash  
root      2      0    0  18:33 ?        00:00:00 [kthreadd]  
root      3      2    0  18:33 ?        00:00:00 [rcu_gp]  
root      4      2    0  18:33 ?        00:00:00 [rcu_par_gp]  
root      5      2    0  18:33 ?        00:00:00 [slub_flushwq]  
root      6      2    0  18:33 ?        00:00:00 [netns]  
root      7      2    0  18:33 ?        00:00:00 [kworker/0:0-cgroup_destroy]  
root      8      2    0  18:33 ?        00:00:00 [kworker/0:0H-events_highpri]  
root      9      2    0  18:33 ?        00:00:00 [kworker/u8:0-loop11]  
root     10      2    0  18:33 ?        00:00:00 [mm_percpu_wq]  
root     11      2    0  18:33 ?        00:00:00 [rcu_tasks_rude_]  
root     12      2    0  18:33 ?        00:00:00 [rcu_tasks_trace]  
root     13      2    0  18:33 ?        00:00:00 [ksoftirqd/0]  
root     14      2    0  18:33 ?        00:00:00 [rcu_sched]  
root     15      2    0  18:33 ?        00:00:00 [migration/0]  
root     16      2    0  18:33 ?        00:00:00 [idle_inject/0]  
root     17      2    0  18:33 ?        00:00:01 [kworker/0:1-events]  
root     18      2    0  18:33 ?        00:00:00 [cpuhp/0]  
root     19      2    0  18:33 ?        00:00:00 [cpuhp/1]  
root     20      2    0  18:33 ?        00:00:00 [idle_inject/1]  
root     21      2    0  18:33 ?        00:00:00 [migration/1]
```

```

nagavenigowda@Ubuntu: ~
nagaven+ 1601 1581 0 18:35 ? 00:00:00 /usr/bin/dbus-daemon --sessi
nagaven+ 1603 1581 0 18:35 ? 00:00:00 /usr/libexec/gvfsd
nagaven+ 1608 1 0 18:35 ? 00:00:00 /usr/bin/gnome-keyring-daemo
nagaven+ 1611 1581 0 18:35 ? 00:00:00 /usr/libexec/gvfsd-fuse /run
nagaven+ 1626 1568 0 18:35 tty2 00:00:00 /usr/libexec/gdm-wayland-ses
nagaven+ 1630 1626 0 18:35 tty2 00:00:00 /usr/libexec/gnome-session-b
nagaven+ 1646 1581 0 18:35 ? 00:00:01 /usr/libexec/tracker-miner-f
nagaven+ 1650 1581 0 18:35 ? 00:00:00 /usr/libexec/xdg-document-po
nagaven+ 1663 1581 0 18:35 ? 00:00:00 /usr/libexec/xdg-permission-
root 1673 1650 0 18:35 ? 00:00:00 fusermount3 -o rw,nosuid,nod
nagaven+ 1699 1581 0 18:35 ? 00:00:00 /usr/libexec/gnome-session-c
nagaven+ 1712 1581 0 18:35 ? 00:00:00 /usr/libexec/gnome-session-b
nagaven+ 1721 1581 0 18:35 ? 00:00:00 /usr/libexec/gvfs-udisks2-vo
nagaven+ 1729 1581 0 18:35 ? 00:00:00 /usr/libexec/gvfs-goa-volume
nagaven+ 1734 1581 0 18:35 ? 00:00:00 /usr/libexec/goa-daemon
nagaven+ 1748 1712 0 18:35 ? 00:00:00 /usr/libexec/at-spi-bus-laun
nagaven+ 1751 1581 35 18:35 ? 00:00:57 /usr/bin/gnome-shell
nagaven+ 1760 1748 0 18:35 ? 00:00:00 /usr/bin/dbus-daemon --confi
nagaven+ 1773 1581 0 18:35 ? 00:00:00 /usr/libexec/goa-identity-se
nagaven+ 1779 1581 0 18:35 ? 00:00:00 /usr/libexec/gvfs-gphoto2-vo
nagaven+ 1784 1581 0 18:35 ? 00:00:00 /usr/libexec/gvfs-afc-volume
nagaven+ 1795 1581 0 18:35 ? 00:00:00 /usr/libexec/gvfs-mtp-volume
nagaven+ 1853 1581 0 18:35 ? 00:00:00 /usr/libexec/gnome-shell-cal
nagaven+ 1859 1581 0 18:35 ? 00:00:00 /usr/libexec/evolution-sourc

```

```

nagavenigowda@Ubuntu: ~
nagaven+ 2274 1581 0 18:35 ? 00:00:00 /usr/bin/VBoxClient --vmsvga
nagaven+ 2275 2274 0 18:35 ? 00:00:00 /usr/bin/VBoxClient --vmsvga
nagaven+ 2284 1581 0 18:35 ? 00:00:00 /usr/libexec/gvfsd-metadata
nagaven+ 2314 1751 65 18:36 ? 00:01:22 /snap/firefox/2277/usr/lib/f
root 2405 2 0 18:36 ? 00:00:00 [kworker/1:3-events]
root 2408 2 0 18:36 ? 00:00:00 [kworker/0:3]
nagaven+ 2474 2314 0 18:36 ? 00:00:00 /snap/firefox/2277/usr/lib/f
nagaven+ 2514 2314 3 18:36 ? 00:00:03 /snap/firefox/2277/usr/lib/f
nagaven+ 2557 2314 32 18:36 ? 00:00:37 /snap/firefox/2277/usr/lib/f
nagaven+ 2571 2314 0 18:36 ? 00:00:00 /snap/firefox/2277/usr/lib/f
nagaven+ 2592 1581 0 18:36 ? 00:00:00 /usr/bin/snap userd
nagaven+ 2664 2314 0 18:36 ? 00:00:00 /snap/firefox/2277/usr/lib/f
nagaven+ 2814 1712 0 18:36 ? 00:00:00 update-notifier
nagaven+ 2843 2314 0 18:36 ? 00:00:00 /snap/firefox/2277/usr/lib/f
nagaven+ 2880 2314 0 18:36 ? 00:00:00 /snap/firefox/2277/usr/lib/f
nagaven+ 2907 2314 0 18:36 ? 00:00:00 /snap/firefox/2277/usr/lib/f
nagaven+ 2910 2314 0 18:36 ? 00:00:00 /snap/firefox/2277/usr/lib/f
nagaven+ 3238 1712 0 18:37 ? 00:00:00 /usr/libexec/deja-dup/deja-d
nagaven+ 3257 1581 5 18:37 ? 00:00:00 /usr/libexec/gnome-terminal-
nagaven+ 3275 3257 0 18:37 pts/0 00:00:00 bash
nagaven+ 3295 1581 4 18:38 ? 00:00:00 /usr/libexec/tracker-extract
nagaven+ 3300 3275 0 18:38 pts/0 00:00:00 ./a.out
nagaven+ 3301 3300 0 18:38 pts/0 00:00:00 ps -ef
nagavenigowda@Ubuntu:~$

```

THANK YOU 😊