OPERATING SYSTEM

PROGRAMMING EXERCISE -1

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F SEC

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

Code:

```c
#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;

}
```

```c
#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:~$ 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]
```

```
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
```

```
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 😊