

# UIT2512---Operating Systems Practices Lab

## 1) Creating an Orphan Process using Python

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Here, you have to write a program in Python to create One Parent - One Child, where the Parent process terminates before the child completes its execution. Hence, the child becomes as an orphan process, at it is taken care a different process. You have to identify the new parent process of that child process in your code and understand new process.

### CODE:

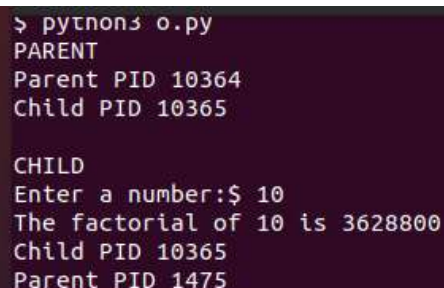
```
import os,time

p = os.fork()
if(p==0):

    print("CHILD")
    factorial=1
    num=int(input("Enter a number:" ))
    for i in range(1,num + 1):
        factorial = factorial*i
    print("The factorial of",num,"is",factorial)
    #time.sleep(3)
    print("Child PID {}".format(os.getpid()))
    print("Parent PID {}\n".format(os.getppid()))

else:
    print("PARENT")
    print("Parent PID {} ".format(os.getpid()))
    print("Child PID {}\n".format(p))
```

### OUTPUT:



```
> python3 o.py
PARENT
Parent PID 10364
Child PID 10365

CHILD
Enter a number:$ 10
The factorial of 10 is 3628800
Child PID 10365
Parent PID 1475
```

**ps-tree -s -p (ppid) command:** The ps-tree command is used to display the processes in a tree-like structure, showing their parent-child relationships. By specifying the -s and -p options, one can see the process names and their Process IDs (PIDs) in the tree.

```

$ ps-tree -s -p 1475
systemd(1)---systemd(3475)---(sd-pam)(1476)
|
|---et-spl-bus-laun(1702)---dbus-daemon(1707)
|   |   |   |
|   |   |   |---et-spl-bus-laun(1703)
|   |   |   |---et-spl-bus-laun(1704)
|   |   |   |---et-spl-bus-laun(1706)
|   |   |   |---et-spl2-registr(1817)
|   |   |   |   |---et-spl2-registr(1818)
|   |   |   |   |---et-spl2-registr(1819)
|   |
|   |---dbus-daemon(1486)
|   |---dconf-service(1740)---(dconf-service)(1741)
|   |   |---(dconf-service)(1742)
|   |
|   |---evolution-addr(2043)---(evolution-addr)(2045)
|   |   |---(evolution-addr)(2046)
|   |   |---(evolution-addr)(2051)
|   |   |---(evolution-addr)(2056)
|   |   |---(evolution-addr)(2059)
|   |
|   |---evolution-calen(1833)---(evolution-calen)(1845)
|   |   |---(evolution-calen)(1846)
|   |   |---(evolution-calen)(2028)
|   |   |---(evolution-calen)(2029)
|   |   |---(evolution-calen)(2036)
|   |   |---(evolution-calen)(2038)
|   |   |---(evolution-calen)(2039)
|   |   |---(evolution-calen)(2076)
|   |
|   |---evolution-sourc(1825)---(evolution-sourc)(1826)
|   |   |---(evolution-sourc)(1827)
|   |   |---(evolution-sourc)(1828)
|
|---firefox(2152)---Isolated Servic(2578)---(Isolated Servic)(2582)
|   |   |---(Isolated Servic)(2583)
|   |   |---(Isolated Servic)(2584)
|   |   |---(Isolated Servic)(2585)
|   |   |---(Isolated Servic)(2587)
|   |   |---(Isolated Servic)(2588)
|   |   |---(Isolated Servic)(2589)
|   |   |---(Isolated Servic)(2590)
|   |   |---(Isolated Servic)(2591)
|   |   |---(Isolated Servic)(2592)
|   |   |---(Isolated Servic)(2729)
|   |   |---(Isolated Servic)(2730)
|   |   |---(Isolated Servic)(2733)
|   |   |---(Isolated Servic)(2734)
|   |   |---(Isolated Servic)(2735)
|   |   |---(Isolated Servic)(2736)
|   |   |---(Isolated Servic)(2749)

```

:

:

```

|---(ibus-pim-lst)(1810)
|---ibus-x11(1805)---(ibus-x11)(1812)
|   |---(ibus-x11)(1813)
|   |---nautilus(3261)---(nautilus)(3262)
|   |   |---(nautilus)(3263)
|   |   |---(nautilus)(3265)
|   |   |---(nautilus)(3266)
|   |   |---(nautilus)(3279)
|   |
|   |---pulseaudio(1481)---(pulseaudio)(1540)
|   |   |---(pulseaudio)(1587)
|   |
|   |---sd-dummy(3119)---(sd-dummy)(3120)
|   |   |---(sd-dummy)(3121)
|   |
|   |---sd_espeak-ng(3113)---(sd_espeak-ng)(3114)
|   |   |---(sd_espeak-ng)(3116)
|   |   |---(sd_espeak-ng)(3117)
|   |   |---(sd_espeak-ng)(3118)
|   |
|   |---seahorse(3323)---(seahorse)(3341)
|   |   |---(seahorse)(3342)
|   |   |---(seahorse)(3386)
|
|---sh(2632)---check-new-rela(2635)---(check-new-rela)(2654)
|   |   |---(check-new-rela)(2655)
|   |   |---(check-new-rela)(2656)
|   |   |---(check-new-rela)(2657)
|
|---speech-dispatch(3122)---(speech-dispatch)(3123)
|   |---(speech-dispatch)(3124)
|
|---tracker-miner-f(1483)---(tracker-miner-f)(1485)
|   |---(tracker-miner-f)(1488)
|   |---(tracker-miner-f)(1490)
|   |---(tracker-miner-f)(1510)
|
|---xdg-desktop-por(2231)---(xdg-desktop-por)(2232)
|   |---(xdg-desktop-por)(2233)
|   |---(xdg-desktop-por)(2252)
|   |---(xdg-desktop-por)(2261)
|
|---xdg-desktop-por(2245)---(xdg-desktop-por)(2246)
|   |---(xdg-desktop-por)(2247)
|   |---(xdg-desktop-por)(2251)
|
|---xdg-document-po(2235)---(xdg-document-po)(2236)
|   |---(xdg-document-po)(2237)
|   |---(xdg-document-po)(2248)
|   |---(xdg-document-po)(2241)
|   |---(xdg-document-po)(2242)
|   |---(xdg-document-po)(2243)
|   |---(xdg-document-po)(2244)
|
|---xdg-permission-(1791)---(xdg-permission-)(1792)
|   |---(xdg-permission-)(1794)

```

**ps -e command:** The ps -e command is used to list all currently running processes on a Unix-based operating system. It displays a list of processes, along with their associated information.

**While execution:**

```
10361 pts/1 00:00:00 ps
$ ps -e
  PID TTY          TIME CMD
    1 ?        00:00:01 systemd
    2 ?        00:00:00 kthreadd
    3 ?        00:00:00 rcu_gp
    4 ?        00:00:00 rcu_par_gp
    5 ?        00:00:00 slub_flushwq
    6 ?        00:00:00 netns
   10 ?        00:00:00 mm_percpu_wq
   11 ?        00:00:00 rcu_tasks_rude
```

```
 6464 ?        00:00:00 kworker/0:0H-kblockd
 6473 ?        00:00:00 gvfsd-dnssd
 7680 ?        00:00:00 kworker/2:0H-kblockd
 8235 ?        00:00:02 kworker/3:0-events
 8236 ?        00:00:02 kworker/0:3-events
 8718 ?        00:00:00 kworker/3:2H
 8818 ?        00:00:00 kworker/u8:2-events_unbound
 8838 ?        00:00:03 kworker/2:2-events
 8945 ?        00:00:04 kworker/1:2-events
 9705 ?        00:00:02 kworker/0:1-events
 9767 ?        00:00:02 kworker/3:2-events
10134 ?        00:01:02 Isolated Web Co
10137 ?        00:00:00 Isolated Web Co
10179 ?        00:00:00 Web Content
10228 ?        00:00:00 kworker/1:0H-radeon-crtc
10264 ?        00:00:00 kworker/1:1-events
10268 ?        00:00:00 kworker/2:1-events
10277 ?        00:00:00 Web Content
10305 ?        00:00:00 Web Content
10360 ?        00:00:00 kworker/u8:0
10365 pts/0      00:00:00 python3
10377 pts/1      00:00:00 sh
10381 pts/1      00:00:00 ps
```

➔ Process 10365 exists.

**After execution:**

```
10179 ?        00:00:00 Web Content
10228 ?        00:00:00 kworker/1:0H-radeon-crtc
10264 ?        00:00:00 kworker/1:1-events
10268 ?        00:00:00 kworker/2:1-events
10277 ?        00:00:00 Web Content
10305 ?        00:00:00 Web Content
10360 ?        00:00:00 kworker/u8:0
10377 pts/1      00:00:00 sh
10387 pts/1      00:00:00 ps
```