

به نام خدا

حدیث غفوری 9825413

سوال 1

```
hadis@whoami:~/Documents/university/terms/OsLab/homeworks/homework4/OsLab4-9825413-ghafouri/answers
x hadis@whoami ~/Documents/university/terms/OsLab/homeworks/homework4/OsLab4-9825413-ghafouri/answers
exec1 exec1.c exec2 exec2.c log.txt soal1 soal1.c soal2 soal2.c soal3 soal3.c
hadis@whoami ~/Documents/university/terms/OsLab/homeworks/homework4/OsLab4-9825413-ghafouri/answers
./soal1
son[147750]
parent[147646]
son[147757]
parent[147646]
son[147762]
parent[147646]
son[147764]
parent[147646]
son[147765]
parent[147646]
son[147770]
parent[147646]
son[147771]
^C
x hadis@whoami ~/Documents/university/terms/OsLab/homeworks/homework4/OsLab4-9825413-ghafouri/answers
```

نتیجه:

Pid ها به صورت متوالی ایجاد میشوند.

سوال 2

```
hadis@whoami ~/Documents/university/term5/OsLab/homeworks/homework4/answers ./soal2
message from child 143870: waited for 3 seconds
message from child 143871: waited for 7 seconds
message from child 143872: waited for 9 seconds
message from child 143873: waited for 1 seconds
message from child 143874: waited for 5 seconds
message from child 143875: waited for 1 seconds
message from child 143876: waited for 7 seconds

hadis@whoami ~/Documents/university/term5/OsLab/homeworks/homework4/answers ./soal2
message from child 143870: waited for 3 seconds
message from child 143871: waited for 7 seconds
message from child 143872: waited for 9 seconds
message from child 143873: waited for 1 seconds
message from child 143874: waited for 5 seconds
message from child 143875: waited for 1 seconds
message from child 143876: waited for 7 seconds
child[143870] is dead now
child[143871] is active now
child[143872] is active now
child[143873] is dead now
message from child 143892: waited for 0 seconds
child[143874] is dead now
child[143871] is dead now
child[143875] is dead now
message from child 143893: waited for 7 seconds
message from child 143894: waited for 4 seconds
child[143872] is dead now
child[143876] is active now
message from child 143895: waited for 3 seconds
child[143873] is dead now
message from child 143896: waited for 4 seconds
message from child 143897: waited for 5 seconds
child[143874] is dead now
child[143875] is dead now
message from child 143898: waited for 9 seconds
message from child 143899: waited for 2 seconds
child[143876] is dead now
message from child 143900: waited for 3 seconds
message from child 143901: waited for 0 seconds
child[143875] is dead now
child[143876] is dead now
message from child 143943: waited for 2 seconds
message from child 143944: waited for 3 seconds
^C
hadis@whoami ~/Documents/university/term5/OsLab/homeworks/homework4/answers
```

زمانی که از sleep استفاده میکنیم:

```
Activities Terminal - /soal2
child[150161] is dead now
child[150162] is dead now
child[150163] is dead now
message from child 150212: waited for 8 seconds
child[150164] is dead now
message from child 150213: waited for 3 seconds
child[150165] is dead now
message from child 150214: waited for 0 seconds
child[150166] is dead now
message from child 150216: waited for 4 seconds
child[150165] is dead now
message from child 150215: waited for 6 seconds
child[150166] is dead now
message from child 150217: waited for 6 seconds
message from child 150218: waited for 6 seconds
message from child 150219: waited for 2 seconds
message from child 150220: waited for 7 seconds
child[150164] is dead now
child[150171] is dead now
child[150166] is dead now
message from child 150221: waited for 4 seconds
child[150171] is dead now
message from child 150222: waited for 1 seconds
message from child 150223: waited for 0 seconds
child[150166] is dead now
message from child 150224: waited for 2 seconds
message from child 150225: waited for 6 seconds
child[150166] is dead now
message from child 150226: waited for 3 seconds
child[150163] is dead now
child[150164] is dead now
child[150171] is dead now
child[150166] is dead now
message from child 150228: waited for 6 seconds
message from child 150227: waited for 7 seconds
message from child 150230: waited for 3 seconds
child[150166] is dead now
message from child 150229: waited for 5 seconds
child[150166] is dead now
message from child 150231: waited for 7 seconds
message from child 150232: waited for 6 seconds

top
top - 14:08:46 up 4:44, 1 user, load average: 1.82, 1.95, 2.29
Tasks: 567 total, 2 running, 565 sleeping, 0 stopped, 0 zombie
%Cpu(s): 13.6 us, 1.6 sy, 0.0 ni, 82.4 id, 0.1 wa, 0.0 hi, 2.3 si, 0.0 st
MiB Mem : 15821.2 total, 1232.8 free, 8260.3 used, 6328.1 buff/cache
MiB Swap: 2048.0 total, 2011.2 free, 36.8 used, 6846.1 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR  S  %CPU  %MEM    TIME+  COMMAND
 150034 hadis    20   0 361200 18572 13944 R 100.0 0.1 0:37.62 tracker-s+
 93425  hadis    20   0 24.4g 647984 111328 S 28.8 4.0 14:11.75 chrome
109995  hadis    20   0 28.4g 221680 98480 S 15.9 1.4 14:54.61 chrome
 87463  hadis    20   0 16.6g 523952 166180 S 11.9 3.2 7:17.24 chrome
 87528  hadis    20   0 16.4g 131452 87032 S 6.0 0.8 2:34.46 chrome
104009  hadis    20   0 24.4g 166996 97584 S 5.0 1.0 7:43.25 chrome
 87522  hadis    20   0 16.7g 506196 129136 S 4.0 3.1 6:00.82 chrome
16776  hadis    20   0 2112756 199256 123800 S 2.6 1.2 7:05.13 vlc
 2574  root     20   0 573756 247680 134780 S 1.7 1.5 11:42.82 Xorg
 2927  hadis    20   0 4486408 536820 119756 S 1.7 3.3 21:45.39 gnome-she+
 87784  hadis    20   0 24.4g 95900 71888 S 1.7 0.6 0:39.57 chrome
 8306  root     20   0 9948 5080 4136 S 1.3 0.0 0:55.39 openvpn
 87662  hadis    20   0 24.4g 94208 71976 S 1.0 0.6 0:18.66 chrome
150019 hadis    20   0 15240 4420 3216 R 1.0 0.0 0:00.31 top
 2047  root     20   0 0 0 0 S 0.7 0.0 2:48.67 irq/162-n+
 93306  hadis    20   0 24.4g 139220 90756 S 0.7 0.9 0:08.59 chrome
 93372  hadis    20   0 20.4g 197120 95600 S 0.7 1.2 0:55.11 chrome
 93645  hadis    20   0 24.4g 102164 76244 S 0.7 0.6 0:04.79 chrome
 93069  hadis    20   0 24.4g 118284 76536 S 0.7 0.7 0:08.72 chrome
 93748  hadis    20   0 24.4g 106904 70860 S 0.7 0.7 0:08.37 chrome
 551  root     -51  0 0 0 0 S 0.3 0.0 0:12.86 irq/157-1+
1429  systemd+ 20   0 24028 12896 9152 S 0.3 0.1 0:06.40 systemd-r+
1605  message+ 20   0 10160 6692 3616 S 0.3 0.0 0:20.29 dbus-daem+
1627  root     20   0 244160 11124 7080 S 0.3 0.1 0:06.17 polkitd
1649  root     20   0 129136 9524 8692 S 0.3 0.1 0:02.62 thermal
3488  hadis    20   0 2090504 188020 84528 S 0.3 1.2 1:51.91 FoxitRead+
 93390  hadis    20   0 24.4g 184184 89888 S 0.3 1.1 0:26.21 chrome
 93461  hadis    20   0 24.4g 105748 71744 S 0.3 0.7 0:08.04 chrome
 93502  hadis    20   0 24.4g 110192 73600 S 0.3 0.7 0:08.36 chrome
 93512  hadis    20   0 24.4g 119212 78716 S 0.3 0.7 0:13.77 chrome
 93514  hadis    20   0 24.4g 116004 76280 S 0.3 0.7 0:09.42 chrome
 93573  hadis    20   0 24.4g 185748 73600 S 0.3 0.7 0:07.97 chrome
 93633  hadis    20   0 24.4g 100980 71420 S 0.3 0.6 0:07.30 chrome
 93634  hadis    20   0 24.4g 131728 75784 S 0.3 0.8 0:27.32 chrome
 93702  hadis    20   0 24.4g 110844 73912 S 0.3 0.7 0:09.11 chrome
 93709  hadis    20   0 24.4g 108220 71292 S 0.3 0.7 0:08.55 chrome
```

زمانی که از حلقه ی for به جای sleep استفاده میکنیم:

۱۰۰ درصد از cpu درگیر میشود.

```
Activities Terminal - /soal2
message from child 364746: waited for 0 seconds
message from child 364747: waited for 0 seconds
message from child 364748: waited for 8 seconds
message from child 364749: waited for 1 seconds
message from child 364750: waited for 8 seconds
message from child 364751: waited for 4 seconds
message from child 364752: waited for 3 seconds

top
top - 14:32:54 up 5:08, 1 user, load average: 1.67, 6.30, 6.96
Tasks: 489 total, 3 running, 479 sleeping, 0 stopped, 7 zombie
%Cpu(s): 17.1 us, 0.2 sy, 0.0 ni, 81.4 id, 0.0 wa, 0.0 hi, 1.2 si, 0.0 st
MiB Mem : 15821.2 total, 6925.4 free, 5033.0 used, 3862.8 buff/cache
MiB Swap: 2048.0 total, 1962.0 free, 86.0 used, 10254.3 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR  S  %CPU  %MEM    TIME+  COMMAND
364305 hadis    20   0 361204 18324 13684 R 100.3 0.1 1:50.83 tracker-s+
364745 hadis    20   0 2360 584 520 R 100.0 0.0 0:10.19 soal2
 3024  hadis    20   0 2600768 483080 62612 S 2.0 3.0 2:16.88 nautilus
16776  hadis    20   0 2112756 159884 84420 S 2.0 1.0 7:39.79 vlc
 2574  root     20   0 597056 219724 85140 S 1.7 1.4 12:14.67 Xorg
 3059  hadis    20   0 1027436 22740 13660 S 0.7 0.1 1:00.51 pulseaudio
2481  hadis    9 -11 410804 19440 87888 S 0.7 3.1 22:32.30 gnome-she+
 2927  hadis    20   0 4494984 497208 87430 S 0.7 3.1 2:26.11 chrome
 3684  hadis    20   0 36.8g 144504 76752 S 0.7 0.9 2:26.11 chrome
146413 hadis    20   0 891084 96432 46516 S 0.7 0.6 0:05.98 eog
150019 hadis    20   0 61144 49400 2980 R 0.7 0.3 0:18.55 top
 3488  hadis    20   0 2090504 152912 49420 S 0.3 0.9 1:59.74 FoxitRead+
 3851  hadis    20   0 36.3g 62752 29164 S 0.3 0.4 0:32.91 code
145391 hadis    20   0 36.3g 266680 35128 S 0.3 1.6 0:15.30 chrome
342767 root     20   0 0 0 0 I 0.3 0.0 0:00.06 kworker/8+
363475 root     20   0 9948 6072 5140 S 0.3 0.0 0:00.61 openvpn
363690 hadis    20   0 24.4g 103740 77436 S 0.3 0.6 0:00.61 chrome
 1  root     20   0 168348 10224 6220 S 0.0 0.1 0:30.97 systemd
 2  root     20   0 0 0 0 S 0.0 0.0 0:00.02 kthreadd
 3  root     0 -20 0 0 0 S 0.0 0.0 0:00.00 rcu_gp
 4  root     0 -20 0 0 0 S 0.0 0.0 0:00.00 rcu_par_gp
 6  root     0 -20 0 0 0 S 0.0 0.0 0:00.00 kworker/0+
 9  root     0 -20 0 0 0 S 0.0 0.0 0:00.00 mm_percpu+
10  root     20   0 0 0 0 S 0.0 0.0 0:00.50 ksoftirqd+
11  root     20   0 0 0 0 S 0.0 0.0 0:16.47 rcu_sched
12  root     rt  0 0 0 0 S 0.0 0.0 0:00.04 migration+
13  root     -51  0 0 0 0 S 0.0 0.0 0:00.00 idle_inje+
14  root     20   0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/0
15  root     20   0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/1
16  root     -51  0 0 0 0 S 0.0 0.0 0:00.00 idle_inje+
17  root     rt  0 0 0 0 S 0.0 0.0 0:00.18 migration+
18  root     20   0 0 0 0 S 0.0 0.0 0:00.23 ksoftirqd+
20  root     0 -20 0 0 0 S 0.0 0.0 0:00.00 kworker/1+
21  root     20   0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/2
22  root     -51  0 0 0 0 S 0.0 0.0 0:00.00 idle_inje+
23  root     rt  0 0 0 0 S 0.0 0.0 0:00.18 migration+
```

سوال ۳

نتیجه هم در ترمینال چاپ میشود هم در فایل log.txt

```
hadis@whoami:~/Documents/university/term5/OsLab/homeworks/homework4/answers
hadis@whoami:~/Documents/university/term5/OsLab/homeworks/homework4/answers$ gcc soal3.c -o soal3
soal3.c:16:11: warning: return type defaults to 'int' [-Wimplicit-int]
   16 |     main(int argc, char *argv[])
       |     ^~~~~
soal3.c: In function 'main':
soal3.c:48:9: warning: null argument where non-null required (argument 2) [-Wnonnull]
   48 |     execvp(address, NULL);
       |     ^~~~~~
soal3.c:56:16: warning: implicit declaration of function 'wait' [-Wimplicit-function-declaration]
   56 |     tpid = wait(&status);
       |               ^~~~~
soal3.c:75:13: warning: null argument where non-null required (argument 2) [-Wnonnull]
   75 |     execvp(address, NULL);
       |     ^~~~~~
hadis@whoami:~/Documents/university/term5/OsLab/homeworks/homework4/answers$ ./soal3
./exec1
in child
exec1
2021-10-22 13:42:57 3001 ./exec1
./exec2
exec2
2021-10-22 13:43:12 5001 ./exec2
hadis@whoami:~/Documents/university/term5/OsLab/homeworks/homework4/answers$ ls
exec1  exec1.c  exec2  exec2.c  log.txt  soal1  soal1.c  soal2  soal2.c  soal3  soal3.c
hadis@whoami:~/Documents/university/term5/OsLab/homeworks/homework4/answers$
```

```
hadis@whoami:~/Documents/university/term5/OsLab/homeworks/homework4/answers
hadis@whoami:~/Documents/university/term5/OsLab/homeworks/homework4/answers$ gcc soal3.c -o soal3
soal3.c:16:11: warning: return type defaults to 'int' [-Wimplicit-int]
   16 |     main(int argc, char *argv[])
       |     ^~~~~
soal3.c: In function 'main':
soal3.c:48:9: warning: null argument where non-null required (argument 2) [-Wnonnull]
   48 |     execvp(address, NULL);
       |     ^~~~~~
soal3.c:56:16: warning: implicit declaration of function 'wait' [-Wimplicit-function-declaration]
   56 |     tpid = wait(&status);
       |               ^~~~~
soal3.c:75:13: warning: null argument where non-null required (argument 2) [-Wnonnull]
   75 |     execvp(address, NULL);
       |     ^~~~~~
hadis@whoami:~/Documents/university/term5/OsLab/homeworks/homework4/answers$ ./soal3
./exec1
in child
exec1
2021-10-22 13:42:57 3001 ./exec1
./exec2
exec2
2021-10-22 13:43:12 5001 ./exec2
hadis@whoami:~/Documents/university/term5/OsLab/homeworks/homework4/answers$
```

Open

log.txt

Save

Documents/university/term5/OsLab/homeworks/homework4/answers

```
1 log.txt
2 -----
3 Date           Time           Execution Time      path
4 -----
5 2021-10-22      13:42:57          3001               ./exec1
6 -----
7 2021-10-22      13:43:12          5001               ./exec2
8 -----
```

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