

OPERATING SYSTEM LAB WEEK-2

SRN: PES2UG23CS272

```
a.out
example1.c
example1.c:Zone.Identifier
example1a.c
example1a.c:Zone.Identifier
example2.c
example2.c:Zone.Identifier
example3.c
example3.c:Zone.Identifier
example4.c
example4.c:Zone.Identifier
file1.txt
file2.txt
folders
link1
nohup.out
orphan.c
orphan.c:Zone.Identifier
osa.c
p1
welcome.c
welcome.c:Zone.Identifier
zombie-1.c
zombie-1.c:Zone.Identifier
keerthan@LAPTOP-1LRPIC3M:~/Documents/folders$ cd C
-bash: cd: C: No such file or directory
keerthan@LAPTOP-1LRPIC3M:~/Documents/folders$ gcc example1.c -o p1
keerthan@LAPTOP-1LRPIC3M:~/Documents/folders$ size example1
size: 'example1': No such file
keerthan@LAPTOP-1LRPIC3M:~/Documents/folders$ size example1.c
size: example1.c: file format not recognized
keerthan@LAPTOP-1LRPIC3M:~/Documents/folders$
```

```
Command Prompt
keerthan@LAPTOP-1LRPIC3M x
keerthan@LAPTOP-1LRPIC3M:~$ cd Documents
keerthan@LAPTOP-1LRPIC3M:~/Documents$ cd folders
keerthan@LAPTOP-1LRPIC3M:~/Documents/folders$ gcc -c example1.c -o example1.o
keerthan@LAPTOP-1LRPIC3M:~/Documents/folders$ size example1.o
   text    data     bss     dec    hex filename
   385      0      0      385    181 example1.o
keerthan@LAPTOP-1LRPIC3M:~/Documents/folders$ ps aux
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         1   0.0  0.1  21732 12836 ?        Ss   13:18   0:00 /sb
root         2   0.0  0.0   2616  1440 ?        Sl   13:18   0:00 /in
root         6   0.0  0.0   2644   132 ?        Sl   13:18   0:00 pla
root        54   0.0  0.2  50444 15656 ?        S<s  13:18   0:00 /us
root       103   0.0  0.0  23992  6112 ?        Ss   13:18   0:00 /us
systemd+  121   0.0  0.1  21452 11924 ?        Ss   13:18   0:00 /us
systemd+  125   0.0  0.0  91020  6568 ?        Ssl  13:18   0:00 /us
root       178   0.0  0.0   4236  2612 ?        Ss   13:18   0:00 /us
message+  179   0.0  0.0   9532  5128 ?        Ss   13:18   0:00 @db
root       195   0.0  0.1  17976  8304 ?        Ss   13:18   0:00 /us
root       206   0.0  0.1 1756096 14020 ?        Ssl  13:18   0:00 /us
root       224   0.0  0.0   3160  1160 hvc0    Ss+  13:18   0:00 /sb
root       238   0.0  0.0   3116  1228 tty1    Ss+  13:18   0:00 /sb
syslog    244   0.0  0.0  222508  5256 ?        Ssl  13:18   0:00 /us
root       267   0.0  0.2 106992 22312 ?        Ssl  13:18   0:00 /us
root       377   0.0  0.0   2620   120 ?        Ss   13:18   0:00 /in
root       378   0.0  0.0   2620   124 ?        S    13:18   0:00 /in
keerthan   379   0.0  0.0   6072  5432 pts/0    Ss   13:18   0:00 -ba
root       380   0.0  0.0   6692  4580 pts/1    Ss   13:18   0:00 /bi
keerthan   459   0.0  0.1  20252 11516 ?        Ss   13:18   0:00 /us
keerthan   465   0.0  0.0  21144  1728 ?        S    13:18   0:00 /sd
keerthan   483   0.0  0.0   6072  4876 pts/1    S+   13:18   0:00 -ba
keerthan   687  12.5  0.0   8280  4088 pts/0    R+   14:03   0:00 ps
keerthan@LAPTOP-1LRPIC3M:~/Documents/folders$ ps 459
   PID TTY      STAT   TIME COMMAND
   459 ?        Ss      0:00 /usr/lib/systemd/systemd --user
keerthan@LAPTOP-1LRPIC3M:~/Documents/folders$
```

```
Command Prompt x keertan@LAPTOP-1LRPIC3M: / x keertan@LAPTOP-1LRPIC3M: ~ / + - x
121: /usr/lib/systemd/systemd-resolved
keertan@LAPTOP-1LRPIC3M: $ pmmap 427
427: -bash
000055dc83666000 192K r----- bash
000055dc83666000 956K r-x-- bash
000055dc83785000 212K r----- bash
000055dc837ba000 16K r----- bash
000055dc837be000 36K rw---- bash
000055dc837c7000 44K rw---- [ anon ]
000055dc9b1c4000 1452K rw---- [ anon ]
00007f7bbef62000 356K r----- LC_CTTYPE
00007f7bbefbb000 4K r----- LC_NUMERIC
00007f7bbefbc000 4K r----- LC_TIME
00007f7bbefbd000 4K r----- LC_COLLATE
00007f7bbefbe000 4K r----- LC_MONETARY
00007f7bbefbf000 4K r----- SYS_LC_MESSAGES
00007f7bbefcf000 4K r----- LC_PAPER
00007f7bbefc1000 28K r--s- gconv-modules.cache
00007f7bbefc8000 12K rw---- [ anon ]
00007f7bbefcb000 160K r----- libc.so.6
00007f7bbefcf300 1568K r-x-- libc.so.6
00007f7bbf17b000 316K r----- libc.so.6
00007f7bbf1ca000 16K r----- libc.so.6
00007f7bbf1cc000 8K rw---- libc.so.6
00007f7bbf1d0000 52K rw---- [ anon ]
00007f7bbf1dd000 56K r----- libtinfo.so.6.4
00007f7bbf1eb000 76K r-x-- libtinfo.so.6.4
00007f7bbf1fe000 56K r----- libtinfo.so.6.4
00007f7bbf20c000 16K r----- libtinfo.so.6.4
00007f7bbf210000 4K rw---- libtinfo.so.6.4
00007f7bbf211000 4K r----- LC_NAME
00007f7bbf212000 4K r----- LC_ADDRESS
00007f7bbf213000 4K r----- LC_TELEPHONE
00007f7bbf214000 4K r----- LC_MEASUREMENT
00007f7bbf215000 4K r----- LC_IDENTIFICATION
00007f7bbf216000 8K rw---- [ anon ]
00007f7bbf218000 4K r----- ld-linux-x86-64.so.2
00007f7bbf219000 172K r-x-- ld-linux-x86-64.so.2
00007f7bbf244000 40K r----- ld-linux-x86-64.so.2
00007f7bbf24a000 8K r----- ld-linux-x86-64.so.2
00007f7bbf250000 8K rw---- ld-linux-x86-64.so.2
00007ffcbbcf3000 132K rw---- [ stack ]
00007ffcbbcd1000 16K r----- [ anon ]
00007ffcbbcd5000 8K r-x-- [ anon ]
total 6072K
```

```
Command Prompt x keertan@LAPTOP-1LRPIC3M: x + - x
keertan@LAPTOP-1LRPIC3M: $ cd /proc/379
keertan@LAPTOP-1LRPIC3M: /proc/379 $ ls
arch_status cmdline environ io mem ns personality sessionid stat timens_offsets
attr comm exe limits mountinfo oom_adj projid_map setgroups statm timers
auxv coredump_filter fd loginuid mounts oom_score root smaps status timerslack_ns
cgroup cpuset cfsino ns_files mountstats oom_score_adj sched smaps_rollup syscall uid_map
clear_refs cwd gid_map maps net pagemap schedstat stack task wchan
keertan@LAPTOP-1LRPIC3M: /proc/379 $ cat maps
55d0283dc000-55d02840c000 r--p 00000000 08:20 1464 /usr/bin/bash
55d02840c000-55d0284fb000 r-xp 00030000 08:20 1464 /usr/bin/bash
55d0284fb000-55d028530000 r--p 0011f000 08:20 1464 /usr/bin/bash
55d028530000-55d028534000 r--p 00154000 08:20 1464 /usr/bin/bash
55d028534000-55d028538000 rw-p 00153000 08:20 1464 /usr/bin/bash
55d028538000-55d028548000 rw-p 00000000 00:00 0
55d054c97000-55d054e02000 rw-p 00000000 00:00 0
7fa18c783000-7fa18c7dc000 r--p 00000000 08:20 2591 /usr/lib/locale/C.utf8/LC_CTTYPE
7fa18c7dc000-7fa18c7dd000 r--p 00000000 08:20 2598 /usr/lib/locale/C.utf8/LC_NUMERIC
7fa18c7dd000-7fa18c7de000 r--p 00000000 08:20 2601 /usr/lib/locale/C.utf8/LC_TIME
7fa18c7de000-7fa18c7df000 r--p 00000000 08:20 2590 /usr/lib/locale/C.utf8/LC_COLLATE
7fa18c7df000-7fa18c7e0000 r--p 00000000 08:20 2596 /usr/lib/locale/C.utf8/LC_MONETARY
7fa18c7e0000-7fa18c7e1000 r--p 00000000 08:20 2595 /usr/lib/locale/C.utf8/LC_MESSAGES/SYS_LC_MESSAGES
7fa18c7e1000-7fa18c7e8000 r--s 00000000 08:20 12404 /usr/lib/x86_64-linux-gnu/gconv/gconv-modules.cache
7fa18c7e8000-7fa18c7eb000 rw-p 00000000 00:00 0
7fa18c7eb000-7fa18c813000 r--p 00000000 08:20 12688 /usr/lib/x86_64-linux-gnu/libc.so.6
7fa18c813000-7fa18c99b000 r-xp 00028000 08:20 12688 /usr/lib/x86_64-linux-gnu/libc.so.6
7fa18c99b000-7fa18c9ea000 r--p 001b0000 08:20 12688 /usr/lib/x86_64-linux-gnu/libc.so.6
7fa18c9ea000-7fa18c9fa000 r--p 001fa000 08:20 12688 /usr/lib/x86_64-linux-gnu/libc.so.6
7fa18c9fa000-7fa18c9fd000 rw-p 00202000 08:20 12688 /usr/lib/x86_64-linux-gnu/libc.so.6
7fa18c9fd000-7fa18c9fd000 rw-p 00000000 00:00 0
7fa18c9fd000-7fa18ca0b000 r--p 00000000 08:20 13023 /usr/lib/x86_64-linux-gnu/libtinfo.so.6.4
7fa18ca0b000-7fa18cale000 r-xp 0000e000 08:20 13023 /usr/lib/x86_64-linux-gnu/libtinfo.so.6.4
7fa18cale000-7fa18ca2c000 r--p 00021000 08:20 13023 /usr/lib/x86_64-linux-gnu/libtinfo.so.6.4
7fa18ca2c000-7fa18ca30000 r--p 0002e000 08:20 13023 /usr/lib/x86_64-linux-gnu/libtinfo.so.6.4
7fa18ca30000-7fa18ca31000 r--p 00032000 08:20 13023 /usr/lib/x86_64-linux-gnu/libtinfo.so.6.4
7fa18ca31000-7fa18ca32000 r--p 00000000 08:20 2599 /usr/lib/locale/C.utf8/LC_PAPER
7fa18ca32000-7fa18ca33000 r--p 00000000 08:20 2597 /usr/lib/locale/C.utf8/LC_NAME
7fa18ca33000-7fa18ca34000 r--p 00000000 08:20 2589 /usr/lib/locale/C.utf8/LC_ADDRESS
7fa18ca34000-7fa18ca35000 r--p 00000000 08:20 2600 /usr/lib/locale/C.utf8/LC_TELEPHONE
7fa18ca35000-7fa18ca36000 r--p 00000000 08:20 2593 /usr/lib/locale/C.utf8/LC_MEASUREMENT
7fa18ca36000-7fa18ca37000 r--p 00000000 08:20 2592 /usr/lib/locale/C.utf8/LC_IDENTIFICATION
7fa18ca37000-7fa18ca39000 rw-p 00000000 00:00 0
7fa18ca39000-7fa18ca3a000 r--p 00000000 08:20 12485 /usr/lib/x86_64-linux-gnu/ld-linux-x86-64.so.2
7fa18ca3a000-7fa18ca65000 r-xp 00001000 08:20 12485 /usr/lib/x86_64-linux-gnu/ld-linux-x86-64.so.2
7fa18ca65000-7fa18ca6f000 r--p 0002c000 08:20 12485 /usr/lib/x86_64-linux-gnu/ld-linux-x86-64.so.2
7fa18ca6f000-7fa18ca71000 r--p 00036000 08:20 12485 /usr/lib/x86_64-linux-gnu/ld-linux-x86-64.so.2
```

```
Command Prompt  X  keerthan@LAPTOP-1LRPIC3M  X  +  v  -  O  X

55d02853d000-55d02853d000 r--p 00154000 08:20 1464 /usr/bin/bash
55d02853d000-55d02853d000 rw-p 00158000 08:20 1464 /usr/bin/bash
55d02853d000-55d02853d000 rw-p 00000000 00:00 0
55d054c97000-55d054e02000 rw-p 00000000 00:00 0
7fa18c783000-7fa18c7dc000 r--p 00000000 08:20 2591 [heap]
7fa18c7dc000-7fa18c7dd000 r--p 00000000 08:20 2598 /usr/lib/locale/C.utf8/LC_CTYPE
7fa18c7dd000-7fa18c7de000 r--p 00000000 08:20 2601 /usr/lib/locale/C.utf8/LC_NUMERIC
7fa18c7de000-7fa18c7df000 r--p 00000000 08:20 2590 /usr/lib/locale/C.utf8/LC_TIME
7fa18c7df000-7fa18c7e0000 r--p 00000000 08:20 2596 /usr/lib/locale/C.utf8/LC_COLLATE
7fa18c7e0000-7fa18c7e1000 r--p 00000000 08:20 2595 /usr/lib/locale/C.utf8/LC_MONETARY
7fa18c7e1000-7fa18c7e2000 r--p 00000000 08:20 2595 /usr/lib/locale/C.utf8/LC_MESSAGES/SYS_LC_MESSAGES
7fa18c7e2000-7fa18c7e3000 r--p 00000000 08:20 12404 /usr/lib/x86_64-linux-gnu/gconv/gconv-modules.cache
7fa18c7e3000-7fa18c7e4000 rw-p 00000000 00:00 0
7fa18c7e4000-7fa18c7e5000 r--p 00000000 08:20 12688 /usr/lib/x86_64-linux-gnu/libc.so.6
7fa18c7e5000-7fa18c7e6000 r--p 00000000 08:20 12688 /usr/lib/x86_64-linux-gnu/libc.so.6
7fa18c7e6000-7fa18c7e7000 r--p 0011e000 08:20 12688 /usr/lib/x86_64-linux-gnu/libc.so.6
7fa18c7e7000-7fa18c7e8000 r--p 0011e000 08:20 12688 /usr/lib/x86_64-linux-gnu/libc.so.6
7fa18c7e8000-7fa18c7e9000 r--p 00202000 08:20 12688 /usr/lib/x86_64-linux-gnu/libc.so.6
7fa18c7e9000-7fa18c7ea000 rw-p 00000000 00:00 0
7fa18c7ea000-7fa18c7eb000 r--p 00000000 08:20 13023 /usr/lib/x86_64-linux-gnu/libtinfo.so.6.4
7fa18c7eb000-7fa18c7ec000 r--p 00000000 08:20 13023 /usr/lib/x86_64-linux-gnu/libtinfo.so.6.4
7fa18c7ec000-7fa18c7ed000 r--p 0002e000 08:20 13023 /usr/lib/x86_64-linux-gnu/libtinfo.so.6.4
7fa18c7ed000-7fa18c7ee000 r--p 0002e000 08:20 13023 /usr/lib/x86_64-linux-gnu/libtinfo.so.6.4
7fa18c7ee000-7fa18c7ef000 r--p 0002e000 08:20 13023 /usr/lib/x86_64-linux-gnu/libtinfo.so.6.4
7fa18c7ef000-7fa18c7f0000 r--p 00000000 08:20 2599 /usr/lib/locale/C.utf8/LC_PAPER
7fa18c7f0000-7fa18c7f1000 r--p 00000000 08:20 2597 /usr/lib/locale/C.utf8/LC_NAME
7fa18c7f1000-7fa18c7f2000 r--p 00000000 08:20 2589 /usr/lib/locale/C.utf8/LC_ADDRESS
7fa18c7f2000-7fa18c7f3000 r--p 00000000 08:20 2600 /usr/lib/locale/C.utf8/LC_TELEPHONE
7fa18c7f3000-7fa18c7f4000 r--p 00000000 08:20 2593 /usr/lib/locale/C.utf8/LC_MEASUREMENT
7fa18c7f4000-7fa18c7f5000 r--p 00000000 08:20 2592 /usr/lib/locale/C.utf8/LC_IDENTIFICATION
7fa18c7f5000-7fa18c7f6000 r--p 00000000 00:00 0
7fa18c7f6000-7fa18c7f7000 r--p 00000000 08:20 12485 /usr/lib/x86_64-linux-gnu/ld-linux-x86-64.so.2
7fa18c7f7000-7fa18c7f8000 r--p 00000000 08:20 12485 /usr/lib/x86_64-linux-gnu/ld-linux-x86-64.so.2
7fa18c7f8000-7fa18c7f9000 r--p 0002c000 08:20 12485 /usr/lib/x86_64-linux-gnu/ld-linux-x86-64.so.2
7fa18c7f9000-7fa18c7fa000 r--p 0002c000 08:20 12485 /usr/lib/x86_64-linux-gnu/ld-linux-x86-64.so.2
7fa18c7fa000-7fa18c7fb000 rw-p 00030000 00:00 0 [stack]
7fa18c7fb000-7fa18c7fc000 r--p 00000000 00:00 0 [vvar]
7fa18c7fc000-7fa18c7fd000 r--p 00000000 00:00 0 [vdso]
7fa18c7fd000-7fa18c7fe000 r--p 00000000 00:00 0
keerthan@LAPTOP-1LRPIC3M: ~$ ps -f
PID TTY STAT TIME COMMAND
403 pts/1 S+ 0:00 -bash
379 pts/0 Ss 0:00 -bash
709 pts/0 R+ 0:00 \_ ps -f
```

```
Command Prompt  X  keerthan@LAPTOP-1LRPIC3M  X  keerthan@LAPTOP-1LRPIC3M  X  +  v  -  O  X

keerthan@LAPTOP-1LRPIC3M: $ cd Documents
keerthan@LAPTOP-1LRPIC3M: ~/Documents $ cd folders
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders $ nano example1
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders $ nano example1a
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders $ nano example2
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders $ ./a.out
This is the parent process.
ID of parent = 746, ID of child = 747
This is the child process.
a.out          file2.txt
example1.c     folders
example1.c:Zone.Identifier link1
example1.o     nohup.out
example1a.c    orphan.c
example1a.c:Zone.Identifier orphan.c:Zone.Identifier
example2.c     osa.c
example2.c:Zone.Identifier pl
example3.c     welcome.c
example3.c:Zone.Identifier welcome.c:Zone.Identifier
example4.c     zombie-1.c
example4.c:Zone.Identifier zombie-1.c:Zone.Identifier
file1.txt
Child process terminated normally with exit code 0
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders $ nano example1a
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders $ ./a.out
This is the parent process.
ID of parent = 750, ID of child = 751
This is the child process.
a.out          file2.txt
example1.c     folders
example1.c:Zone.Identifier link1
example1.o     nohup.out
example1a.c    orphan.c
example1a.c:Zone.Identifier orphan.c:Zone.Identifier
example2.c     osa.c
example2.c:Zone.Identifier pl
example3.c     welcome.c
example3.c:Zone.Identifier welcome.c:Zone.Identifier
example4.c     zombie-1.c
example4.c:Zone.Identifier zombie-1.c:Zone.Identifier
file1.txt
```

```
GNU nano 7.2 example1.c
// program to demonstrate fork()

#include <stdio.h>
#include <unistd.h>

int main()
{
    pid_t p1;
    int y = 0;
    p1 = fork();
    if (p1 > 0) //parent process
    {
        y = y - 1;
        printf("This is parent. Process Id = %d, y = %d\n", getpid(), y);
    }
    else if (p1 == 0) // child process
    {
        y = y + 1;
        printf("This is child. Process Id = %d, Parent Process Id = %d, y = %d\n", getpid(), getppid(), y);
    }
    else //fork failed
    {
        printf("fork creation failed!!!\n");
    }
}
```

Help Exit Write Out Read File Where Is Replace Cut Paste Execute Justify Location Go To Line Undo Redo Set Mark Copy To Bracket Where Was

```
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders$ gcc example1.c
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders$ ./a.out
This is parent. Process Id = 797, y = -1
This is child. Process Id = 798, Parent Process Id = 797, y = 1
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders$
```

```
GNU nano 7.2 example1a.c
/* program to demonstrate fork() */

#include <stdio.h>
#include <unistd.h>

int main()
{
    pid_t p1;
    int i = 0, y = 0;
    p1 = fork();
    if (p1 > 0) //parent process
    {
        for (i = 0; i < 5; i++)
        {
            sleep(i);
            y = y - 1;
            printf("This is parent. Process Id = %d, y = %d\n", getpid(), y);
        }
    }
    else if (p1 == 0) // child process
    {
        for (i = 0; i < 5; i++)
        {
            sleep(i);
            y = y + 1;
            printf("This is child. Process Id = %d, Parent Process Id = %d, y = %d\n", getpid(), getppid(), y);
        }
    }
    else //fork failed
    {
    }
}
```

```
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folder$ gcc example1a.c
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folder$ ./a.out
This is parent. Process Id = 815, y = -1
This is child. Process Id = 816, Parent Process Id = 815, y = 1
This is child. Process Id = 816, Parent Process Id = 815, y = 2
This is parent. Process Id = 815, y = -2
This is child. Process Id = 816, Parent Process Id = 815, y = 3
This is parent. Process Id = 815, y = -3
This is child. Process Id = 816, Parent Process Id = 815, y = 4
This is parent. Process Id = 815, y = -4
This is parent. Process Id = 815, y = -5
This is child. Process Id = 816, Parent Process Id = 815, y = 5
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folder$
```

```
GNU nano 7.2 welcome.c
#include <stdio.h>
int main()
{
    printf("Welcome to process control demonstration\n");
}
```

Read 5 lines

Help Exit Write Out Read File Where Is Replace Cut Paste Execute Justify Location Go To Line Undo Redo Set Mark Copy To Bracket Where Was

```
keerthan@LAPTOP-1LRPIC3M:~/Documents/folder$ nano welcome.c
keerthan@LAPTOP-1LRPIC3M:~/Documents/folder$ gcc welcome.c
keerthan@LAPTOP-1LRPIC3M:~/Documents/folder$ ./a.out
Welcome to process control demonstration
keerthan@LAPTOP-1LRPIC3M:~/Documents/folder$
```

```
GNU nano 7.2 example2.c
// program to demonstrate fork() and wait()

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

int main()
{
    pid_t p1;
    int y = 0;
    p1 = fork();
    if (p1 > 0) //parent process
    {
        wait(NULL);
        y = y - 1;
        printf("This is parent. Process Id = %d, y = %d\n", getpid(), y);
    }
    else if (p1 == 0) // child process
    {
        y = y + 1;
        printf("This is child. Process Id = %d, Parent Process Id = %d, y = %d\n", getpid(), getppid(), y);
        exit(0);
    }
    else //fork failed
    {
        printf("fork creation failed!!!\n");
    }
}
```

Read 36 lines

Help Exit Write Out Read File Where Is Replace Cut Paste Execute Justify Location Go To Line Undo Redo Set Mark Copy To Bracket Where Was

```

keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders$ nano example2.c
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders$ gcc example2.c
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders$ ./a.out
This is child. Process Id = 833, Parent Process Id = 832, y = 1
This is parent. Process Id = 832, y = -1
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders$

```

```

GNU nano 7.2 example3.c
// program to demonstrate creation of child and grandchild processes using fork() and wait()

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

int main()
{
    pid_t p1, p2;
    int y = 0;

    p1 = fork();

    if (p1 > 0) //parent process
    {
        wait(NULL);

        y = y - 1;

        printf("This is parent. Process Id = %d, y = %d\n", getpid(), y);
    }
    else if (p1 == 0) // child process
    {
        p2 = fork();

        if (p2 > 0)
        {
            wait(NULL);
        }
        else if (p2 == 0)
        {
            y = y + 5;

            printf("This is grandchild. Process Id = %d, Parent Process Id = %d, y = %d\n", getpid(), getppid(), y);
        }
    }
}

```

[Read 51 lines]

Ctrl-H Help	Ctrl-O Write Out	Ctrl-W Where Is	Ctrl-X Cut	Ctrl-E Execute	Ctrl-L Location	Ctrl-U Undo	Ctrl-A Set Mark	Ctrl-] To Bracket
Ctrl-X Exit	Ctrl-R Read File	Ctrl-_ Replace	Ctrl-U Paste	Ctrl-J Justify	Ctrl-/ Go To Line	Ctrl-W Redo	Ctrl-G Copy	Ctrl-_ Where Was

```

keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders$ nano example3.c
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders$ gcc example3.c
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders$ ./a.out
This is grandchild. Process Id = 844, Parent Process Id = 843, y = 5
This is child. Process Id = 843, Parent Process Id = 842, y = 1
This is parent. Process Id = 842, y = -1

```

```
GNU nano 7.2 example4.c
// program to demonstrate creation of child processes and executing commands using fork(), execl() and wait()

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

int main()
{
    pid_t p1, p2;
    int y = 0;

    p1 = fork();

    if (p1 > 0) //parent process
    {
        wait(NULL);

        y = y - 1;

        printf("This is parent. Process Id = %d, y = %d\n", getpid(), y);

        execl("/bin/ls", "/home/suresh/OS", NULL);
    }
    else if (p1 == 0) // child process
    {
        p2 = fork();

        if (p2 > 0)
        {
            wait(NULL);
        }
        else if (p2 == 0)
        {
            y = y + 5;
        }
    }
}
```

```
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders$ nano example4.c
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders$ gcc example4.c
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders$ ./a.out
This is grandchild. Process Id = 852, Parent Process Id = 852, y = 5
zombie-1.c:Zone.Identifier p1 nohup.out file1.txt example3.c example1a.c a.out
welcome.c:Zone.Identifier osa.c link1 example4.c:Zone.Identifier example2.c:Zone.Identifier example1.o
welcome.c orphan.c:Zone.Identifier folders example4.c example2.c example1.c:Zone.Identifier
welcome.c orphan.c file2.txt example3.c:Zone.Identifier example1a.c:Zone.Identifier example1.c
This is child. Process Id = 851, Parent Process Id = 851, y = 1
This is parent. Process Id = 851, y = -1
a.out example1a.c:Zone.Identifier example4.c link1 p1
example1.c example2.c example4.c:Zone.Identifier nohup.out welcome.c
example1.c:Zone.Identifier example2.c:Zone.Identifier file1.txt orphan.c welcome.c:Zone.Identifier
example1.o example3.c file2.txt orphan.c:Zone.Identifier zombie-1.c
example1a.c example3.c:Zone.Identifier folders osa.c zombie-1.c:Zone.Identifier
```



```
GNU nano 7.2 orphan.c
// Program to demonstrate Orphan Process.
// Parent process finishes execution while the child process is running. The child process becomes orphan.

#include <stdio.h>
#include <stdlib.h>
#include <sys/types.h>
#include <unistd.h>

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

    if (pid > 0) // parent process
    {
        printf("In parent process process id = %d\n", getpid());
        exit(0);
    }
    else if (pid == 0) //child process
    {
        sleep(30);
        printf("In child process. process id = %d, parent process id = %d\n", getpid(), getppid());
    }

    return 0;
}
```

```
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders$ nano orphan.c
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders$ gcc orphan.c
keerthan@LAPTOP-1LRPIC3M: ~/Documents/folders$ ./a.out
In parent process process id = 863
```

```
GNU nano 7.2 zombie-1.c
// Program to demonstrate Zombie Process
// Child becomes Zombie as parent is sleeping when child process exits.

#include <stdio.h>
#include <stdlib.h>
#include <sys/types.h>
#include <unistd.h>

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

    if (pid > 0) //Parent process
    {
        sleep(50);
        printf("In parent\n");
    }
    else if (pid == 0) //Child process
    {
        printf("In child\n");
        exit(0);
    }

    return 0;
}
```

```
keerthan@LAPTOP-1LRPIC3M:~$ cd Documents
keerthan@LAPTOP-1LRPIC3M:~/Documents$ cd folders
keerthan@LAPTOP-1LRPIC3M:~/Documents/folders$ nano zombie-1.c
keerthan@LAPTOP-1LRPIC3M:~/Documents/folders$ gcc zombie-1.c
keerthan@LAPTOP-1LRPIC3M:~/Documents/folders$ ./a.out
In child
In parent
```