Politechnika Świętokrzyska w Kielcach	
Wydział Elektrotechniki, Automatyki i Informatyki	
Programowanie Współbieżne	
laboratorium	
Temat: **Procesy** (laboratorium nr 2)	Autor: **Mateusz Snoch** Grupa: **3ID11A**
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Przydatne dane:

fork – tworzenie nowego procesu

getpid – zwrócenie ID procesu wywołującego

getppid – zwrócenie ID procesu macierzystego przez potomka

wait – oczekiwanie na zakończenie się dowolnego procesu potomka (z parametrem NULL) lub wszystkich procesów potomnych (z parametrem &status)

signal – wysłanie sygnału

sleep – uśpienie procesu na daną ilość sekund

Zadanie 2

Napisać/przepisać i uruchomić poniższy program, zrozumieć jak działa.

```
#include <stdio.h>
#include <stdlib.h>
main()
{
int childpid;
int status=1;
int zakonczono;
printf("startuje proces macierzysty pid %d\n",getpid());
if ((childpid = fork()) == -1)
    {
    perror("nie moge forknac");
    exit(1);
    }
else
    if (childpid ==0 )
      {
      printf("Proces potomny o pidzie %d z rodzica
%d\n",getpid(),getppid());
      }
    else
      {
      printf("Proces macierzysty o pidzie %d i dziecku
%d\n",getpid(),childpid);
      }
exit(0);
}

Wyniki:
83642@st06-lab319:~$ ./z2
startuje proces macierzysty pid 4220
Proces macierzysty o pidzie 4220 i dziecku 4221
Proces potomny o pidzie 4221 z rodzica 2085
```


Zadanie 3

Sprawić by proces potomny zakończył się po procesie macierzystym (funkcja sleep). Sprawdzić identyfikator procesu macierzystego w procesie potomnym po zakończeniu rodzica. Sprawdzić by proces potomny zakończył się przed końcem rodzica (rodzic jeszcze nie wywołuje wait). Zbadać czy proces potomny widnieje jeszcze w systemie (ps -efa).

```
#include <stdio.h>
#include <stdlib.h>
main()
{
int childpid;
int status=1;
int zakonczono;
printf("startuje proces macierzysty pid %d\n",getpid());
if ((childpid = fork()) == -1)
    {
    perror("nie moge forknac");
    exit(1);
    }
else
    if (childpid ==0 )
        {
        sleep(10);
        printf("Proces potomny o pidzie %d z rodzica
%d\n",getpid(),getppid());
        }
    else
        {
        printf("Proces macierzysty o pidzie %d i dziecku
%d\n",getpid(),childpid);
}
        return 0;
}
```


```
Wynik:
83642@st06-lab319:~$ ./z3a
startuje proces macierzysty pid 4982
Proces macierzysty o pidzie 4982 i dziecku 4983
83642@st06-lab319:~$ Proces potomny o pidzie 4983 z rodzica 2085

83642@st06-lab319:~$ ps -efa
UID        PID  PPID  C STIME TTY          TIME CMD
root         1     0  0 18:55 ?        00:00:01 /sbin/init
root         2     0  0 18:55 ?        00:00:00 [kthreadd]
root         3     2  0 18:55 ?        00:00:00 [ksoftirqd/0]
root         5     2  0 18:55 ?        00:00:00 [kworker/0:0H]
root         6     2  0 18:55 ?        00:00:00 [kworker/u16:0]
root         7     2  0 18:55 ?        00:00:00 [rcu_sched]
root         8     2  0 18:55 ?        00:00:00 [rcuos/0]
root         9     2  0 18:55 ?        00:00:00 [rcuos/1]
root        10     2  0 18:55 ?        00:00:00 [rcuos/2]
root        11     2  0 18:55 ?        00:00:00 [rcuos/3]
root        12     2  0 18:55 ?        00:00:00 [rcuos/4]
root        13     2  0 18:55 ?        00:00:00 [rcuos/5]
root        14     2  0 18:55 ?        00:00:00 [rcuos/6]
root        15     2  0 18:55 ?        00:00:00 [rcuos/7]
```

```
root          16     2   0 18:55 ?        00:00:00 [rcu_bh]
root          17     2   0 18:55 ?        00:00:00 [rcuob/0]
root          18     2   0 18:55 ?        00:00:00 [rcuob/1]
root          19     2   0 18:55 ?        00:00:00 [rcuob/2]
root          20     2   0 18:55 ?        00:00:00 [rcuob/3]
root          21     2   0 18:55 ?        00:00:00 [rcuob/4]
root          22     2   0 18:55 ?        00:00:00 [rcuob/5]
root          23     2   0 18:55 ?        00:00:00 [rcuob/6]
root          24     2   0 18:55 ?        00:00:00 [rcuob/7]
root          25     2   0 18:55 ?        00:00:00 [migration/0]
root          26     2   0 18:55 ?        00:00:00 [watchdog/0]
root          27     2   0 18:55 ?        00:00:00 [watchdog/1]
root          28     2   0 18:55 ?        00:00:00 [migration/1]
root          29     2   0 18:55 ?        00:00:00 [ksoftirqd/1]
root          31     2   0 18:55 ?        00:00:00 [kworker/1:0H]
root          32     2   0 18:55 ?        00:00:00 [watchdog/2]
root          33     2   0 18:55 ?        00:00:00 [migration/2]
root          34     2   0 18:55 ?        00:00:00 [ksoftirqd/2]
root          36     2   0 18:55 ?        00:00:00 [kworker/2:0H]
root          37     2   0 18:55 ?        00:00:00 [watchdog/3]
root          38     2   0 18:55 ?        00:00:00 [migration/3]
root          39     2   0 18:55 ?        00:00:00 [ksoftirqd/3]
root          40     2   0 18:55 ?        00:00:00 [kworker/3:0]
root          41     2   0 18:55 ?        00:00:00 [kworker/3:0H]
root          42     2   0 18:55 ?        00:00:00 [khelper]
root          43     2   0 18:55 ?        00:00:00 [kdevtmpfs]
root          44     2   0 18:55 ?        00:00:00 [netns]
root          45     2   0 18:55 ?        00:00:00 [writeback]
root          46     2   0 18:55 ?        00:00:00 [kintegrityd]
root          47     2   0 18:55 ?        00:00:00 [bioset]
root          48     2   0 18:55 ?        00:00:00 [kworker/u17:0]
root          49     2   0 18:55 ?        00:00:00 [kblockd]
root          50     2   0 18:55 ?        00:00:00 [ata_sff]
root          51     2   0 18:55 ?        00:00:00 [khubd]
root          52     2   0 18:55 ?        00:00:00 [md]
root          53     2   0 18:55 ?        00:00:00 [devfreq_wq]
root          54     2   0 18:55 ?        00:00:00 [kworker/0:1]
root          55     2   0 18:55 ?        00:00:00 [kworker/1:1]
root          56     2   0 18:55 ?        00:00:00 [kworker/2:1]
root          57     2   0 18:55 ?        00:00:00 [kworker/3:1]
root          59     2   0 18:55 ?        00:00:00 [khungtaskd]
root          60     2   0 18:55 ?        00:00:00 [kswapd0]
root          61     2   0 18:55 ?        00:00:00 [ksmd]
root          62     2   0 18:55 ?        00:00:00 [khugepaged]
root          63     2   0 18:55 ?        00:00:00 [fsnotify_mark]
root          64     2   0 18:55 ?        00:00:00 [ecryptfs-kthrea]
root          65     2   0 18:55 ?        00:00:00 [crypto]
root          77     2   0 18:55 ?        00:00:00 [kthrotld]
root          79     2   0 18:55 ?        00:00:00 [scsi_eh_0]
root          80     2   0 18:55 ?        00:00:00 [scsi_eh_1]
root          82     2   0 18:55 ?        00:00:00 [scsi_eh_2]
root          83     2   0 18:55 ?        00:00:00 [scsi_eh_3]
root          86     2   0 18:55 ?        00:00:00 [kworker/u16:5]
root         105     2   0 18:55 ?        00:00:00 [deferwq]
root         106     2   0 18:55 ?        00:00:00 [charger_manager]
root         167     2   0 18:55 ?        00:00:00 [jbd2/sda8-8]
root         168     2   0 18:55 ?        00:00:00 [ext4-rsv-conver]
```

```
root          291     1  0 18:56 ?          00:00:00 upstart-udev-bridge --
daemon
root          297     1  0 18:56 ?          00:00:00 /lib/systemd/systemd-
udevd --dae
root          338     2  0 18:56 ?          00:00:00 [irq/46-mei_me]
root          352     2  0 18:56 ?          00:00:00 [edac-poller]
root          363     2  0 18:56 ?          00:00:00 [kvm-irqfd-clean]
root          364     2  0 18:56 ?          00:00:00 [hd-audio0]
root          442     1  0 18:56 ?          00:00:00 upstart-socket-bridge -
-daemon
root          498     1  0 18:56 ?          00:00:00 rpcbind
root          525     2  0 18:56 ?          00:00:00 [ttm_swap]
root          526     2  0 18:56 ?          00:00:00 [kworker/u17:1]
root          544     2  0 18:56 ?          00:00:00 [hd-audio1]
root          628     1  0 18:56 ?          00:00:00 upstart-file-bridge --
daemon
syslog        641     1  0 18:56 ?          00:00:00 rsyslogd
message+      646     1  0 18:56 ?          00:00:01 dbus-daemon --system --
fork
root          659     1  0 18:56 ?          00:00:00 /usr/sbin/ModemManager
root          677     1  0 18:56 ?          00:00:00 /usr/sbin/bluetoothd
root          684     2  0 18:56 ?          00:00:00 [krfcommd]
avahi         689     1  0 18:56 ?          00:00:00 avahi-daemon: running
[st06-lab3
root          696     1  0 18:56 ?          00:00:00 /lib/systemd/systemd-
logind
avahi         698   689  0 18:56 ?          00:00:00 avahi-daemon: chroot
helper
root          705     1  0 18:56 ?          00:00:00 ypbind -broadcast -no-
dbus
root          715     1  0 18:56 ?          00:00:00 NetworkManager
root          721     1  0 18:56 ?          00:00:01 /usr/lib/policykit-
1/polkitd --n
root          877     1  0 18:56 tty4       00:00:00 /sbin/getty -8 38400
tty4
root          881     1  0 18:56 tty5       00:00:00 /sbin/getty -8 38400
tty5
root          888     1  0 18:56 tty2       00:00:00 /sbin/getty -8 38400
tty2
root          889     1  0 18:56 tty3       00:00:00 /sbin/getty -8 38400
tty3
root          892     1  0 18:56 tty6       00:00:00 /sbin/getty -8 38400
tty6
root          936     1  0 18:56 ?          00:00:00 /usr/sbin/sshd -D
root          974     1  0 18:56 ?          00:00:00 acpid -c
/etc/acpi/events -s /va
root          977     1  0 18:56 ?          00:00:00 /usr/sbin/cups-browsed
root          998     1  0 18:56 ?          00:00:00 /usr/sbin/irqbalance
root         1000     1  0 18:56 ?          00:00:00 cron
whoopsie     1006     1  0 18:56 ?          00:00:00 whoopsie
root         1011     1  0 18:56 ?          00:00:00 /opt/pbis/sbin/lwsmd --
start-as-
root         1034  1011  0 18:56 ?          00:00:00 lw-container lwreg
root         1063  1011  0 18:56 ?          00:00:00 lw-container eventlog
root         1089  1011  0 18:56 ?          00:00:00 lw-container netlogon
root         1114  1011  0 18:56 ?          00:00:00 lw-container lwio
root         1141  1011  0 18:56 ?          00:00:01 lw-container lsass
root         1175  1011  0 18:56 ?          00:00:00 lw-container reapsysl
```

```
root       1232     1  0 18:56 ?          00:00:00 /usr/sbin/gpm -m
/dev/input/mice
kernoops   1261     1  0 18:56 ?          00:00:00 /usr/sbin/kerneloops
root       1319     1  0 18:56 tty1       00:00:00 /sbin/getty -8 38400
tty1
nobody     1325   715  0 18:56 ?          00:00:00 /usr/sbin/dnsmasq --no-
resolv --
root       1530     1  0 18:56 ?          00:00:00 /usr/sbin/cupsd -f
lp         1533  1530  0 18:56 ?          00:00:00
/usr/lib/cups/notifier/dbus dbus
root       1538     1  0 18:56 ?          00:00:00 lightdm
root       1550  1538  2 18:56 tty7       00:00:20 /usr/bin/X -core :0 -
seat seat0
root       1553     1  0 18:56 ?          00:00:00
/usr/lib/accountsservice/account
root       1612     2  0 18:56 ?          00:00:00 [kauditd]
root       1655  1538  0 18:56 ?          00:00:00 lightdm --session-child
12 19
root       1714     1  0 18:56 ?          00:00:00 /usr/lib/upower/upowerd
rtkit      1745     1  0 18:56 ?          00:00:00 /usr/lib/rtkit/rtkit-
daemon
root       2013     2  0 18:56 ?          00:00:00 [kworker/1:2]
root       2018     2  0 18:56 ?          00:00:00 [kworker/2:2]
root       2052     2  0 18:57 ?          00:00:00 [cifsiod]
root       2056     2  0 18:57 ?          00:00:00 [cifsd]
83642      2083     1  0 18:57 ?          00:00:00 /usr/bin/gnome-keyring-
daemon --
83642      2085  1655  0 18:57 ?          00:00:00 init --user
83642      2151  2085  0 18:57 ?          00:00:00 ssh-agent -s
83642      2157  2085  0 18:57 ?          00:00:00 dbus-daemon --fork --
session --a
83642      2166  2085  0 18:57 ?          00:00:00 upstart-event-bridge
83642      2172  2085  0 18:57 ?          00:00:00 /usr/lib/x86_64-linux-
gnu/hud/wi
83642      2182  2085  0 18:57 ?          00:00:00 upstart-file-bridge --
daemon --u
83642      2184  2085  0 18:57 ?          00:00:00 upstart-dbus-bridge --
daemon --s
83642      2185  2085  0 18:57 ?          00:00:00 upstart-dbus-bridge --
daemon --s
83642      2187  2085  0 18:57 ?          00:00:02 /usr/bin/ibus-daemon --
daemonize
83642      2224  2085  0 18:57 ?          00:00:00 /usr/lib/x86_64-linux-
gnu/bamf/b
83642      2229  2085  0 18:57 ?          00:00:00 /usr/lib/gvfs/gvfsd
83642      2233  2085  0 18:57 ?          00:00:00 /usr/lib/gvfs/gvfsd-
fuse /run/us
83642      2247  2085  0 18:57 ?          00:00:00 /usr/lib/dconf/dconf-
service
83642      2279  2187  0 18:57 ?          00:00:00 /usr/lib/ibus/ibus-
dconf
83642      2281  2187  0 18:57 ?          00:00:00 /usr/lib/ibus/ibus-ui-
gtk3
83642      2283  2085  0 18:57 ?          00:00:00 /usr/lib/x86_64-linux-
gnu/gconf/
83642      2288  2085  0 18:57 ?          00:00:00 /usr/lib/ibus/ibus-x11
--kill-da
```

```
83642      2305  2187  0 18:57 ?         00:00:00 /usr/lib/ibus/ibus-
engine-simple
root       2314     2  0 18:57 ?         00:00:00 [kworker/0:2]
83642      2342  2085  0 18:57 ?         00:00:00 /usr/lib/unity-
settings-daemon/u
83642      2346  2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/hud/hu
83642      2351  2085  0 18:57 ?         00:00:00 /usr/lib/at-spi2-
core/at-spi-bus
83642      2352  2085  0 18:57 ?         00:00:00 gnome-session --
session=ubuntu
83642      2354  2085  0 18:57 ?         00:00:00 /usr/lib/unity/unity-
panel-servi
83642      2358  2351  0 18:57 ?         00:00:00 /bin/dbus-daemon --
config-file=/
83642      2372  2085  0 18:57 ?         00:00:00 /usr/lib/at-spi2-
core/at-spi2-re
83642      2381  2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642      2383  2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642      2384  2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642      2387  2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642      2388  2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642      2395  2085  0 18:57 ?         00:00:01 /usr/lib/x86_64-linux-
gnu/indica
83642      2396  2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642      2411  2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/notify
83642      2462  2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642      2470  2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642      2488  2085  0 18:57 ?         00:00:00
/usr/lib/evolution/evolution-sou
colord     2569     1  0 18:57 ?         00:00:00 /usr/lib/colord/colord
83642      2817  2352  1 18:57 ?         00:00:13 compiz
83642      2854  2085  0 18:57 ?         00:00:00
/usr/lib/evolution/evolution-cal
83642      2871  2085  0 18:57 ?         00:00:00 /usr/lib/gvfs/gvfsd-
metadata
83642      2877  2352  0 18:57 ?         00:00:00 /usr/lib/policykit-1-
gnome/polki
83642      2879  2352  0 18:57 ?         00:00:00 nm-applet
83642      2880  2352  0 18:57 ?         00:00:00 /usr/lib/unity-
settings-daemon/u
83642      2882  2352  0 18:57 ?         00:00:01 nautilus -n
83642      2897  2085  0 18:57 ?         00:00:00 /usr/lib/gvfs/gvfs-
udisks2-volum
root       2902     1  0 18:57 ?         00:00:00
/usr/lib/udisks2/udisksd --no-de
83642      2915  2085  0 18:57 ?         00:00:00 /usr/lib/gvfs/gvfs-
gphoto2-volum
```

```
83642      2926  2085  0 18:57 ?        00:00:00 /usr/lib/gvfs/gvfs-mtp-
volume-mo
83642      2931  2085  0 18:57 ?        00:00:00 /usr/lib/gvfs/gvfs-afc-
volume-mo
83642      2973  2085  0 18:57 ?        00:00:00 /usr/lib/gvfs/gvfsd-
trash --spaw
83642      2985  2085  0 18:57 ?        00:00:00 /usr/lib/gvfs/gvfsd-
burn --spawn
83642      3012  2352  0 18:57 ?        00:00:00 telepathy-indicator
83642      3024  2085  0 18:57 ?        00:00:00
/usr/lib/telepathy/mission-contr
83642      3047  2352  0 18:57 ?        00:00:00 zeitgeist-datahub
83642      3052  2085  0 18:57 ?        00:00:00 /usr/bin/zeitgeist-
daemon
83642      3058  2085  0 18:57 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/zeitge
83642      3080  3058  0 18:57 ?        00:00:00 /bin/cat
83642      3120  2085  4 18:57 ?        00:00:27
/usr/lib/firefox/firefox
83642      3148  2085  0 18:57 ?        00:00:00 /usr/lib/libunity-
webapps/unity-
83642      3256  2352  0 18:58 ?        00:00:00 update-notifier
83642      3393  2352  0 18:59 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/deja-d
83642      3661  2085  0 19:01 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/unity-
83642      3673  2085  0 19:01 ?        00:00:00 /usr/bin/unity-scope-
loader appl
83642      3677  2085  0 19:01 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/unity-
83642      3721  2085  0 19:01 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/unity-
83642      3737  2085  0 19:01 ?        00:00:02 gnome-terminal
83642      3744  3737  0 19:01 ?        00:00:00 gnome-pty-helper
83642      3745  3737  0 19:01 pts/1   00:00:00 bash
root       4283     2  0 19:04 ?        00:00:00 [kworker/u16:1]
83642      4298  2085  0 19:04 ?        00:00:01 gedit
/home/83642/Pulpit/wyniki
root       4315     2  0 19:04 ?        00:00:00 [kworker/0:0]
83642      4834  3737  0 19:08 pts/4   00:00:00 bash
83642      4983  2085  0 19:08 pts/1   00:00:00 ./z3a
83642      4985  4834  0 19:09 pts/4   00:00:00 ps -efa
```

```c
#include <stdio.h>
#include <stdlib.h>
main()
{
int childpid;
int status=1;
int zakonczono;
printf("startuje proces macierzysty pid %d\n",getpid());
if ((childpid = fork()) == -1)
    {
    perror("nie moge forknac");
    exit(1);
    }
else
```

```
    if (childpid ==0 )
        {
        printf("Proces potomny o pidzie %d z rodzica
%d\n",getpid(),getppid());
        }
    else
        {
        sleep(10);
        printf("Proces macierzysty o pidzie %d i dziecku
%d\n",getpid(),childpid);
}
return 0;
}
```

Wynik:
```
83642@st06-lab319:~$ ./z3b
startuje proces macierzysty pid 5478
Proces potomny o pidzie 5479 z rodzica 5478
Proces macierzysty o pidzie 5478 i dziecku 5479

83642@st06-lab319:~$ ps -efa
UID        PID  PPID  C STIME TTY          TIME CMD
root         1     0  0 18:55 ?        00:00:01 /sbin/init
root         2     0  0 18:55 ?        00:00:00 [kthreadd]
root         3     2  0 18:55 ?        00:00:00 [ksoftirqd/0]
root         5     2  0 18:55 ?        00:00:00 [kworker/0:0H]
root         7     2  0 18:55 ?        00:00:00 [rcu_sched]
root         8     2  0 18:55 ?        00:00:00 [rcuos/0]
root         9     2  0 18:55 ?        00:00:00 [rcuos/1]
root        10     2  0 18:55 ?        00:00:00 [rcuos/2]
root        11     2  0 18:55 ?        00:00:00 [rcuos/3]
root        12     2  0 18:55 ?        00:00:00 [rcuos/4]
root        13     2  0 18:55 ?        00:00:00 [rcuos/5]
root        14     2  0 18:55 ?        00:00:00 [rcuos/6]
root        15     2  0 18:55 ?        00:00:00 [rcuos/7]
root        16     2  0 18:55 ?        00:00:00 [rcu_bh]
root        17     2  0 18:55 ?        00:00:00 [rcuob/0]
root        18     2  0 18:55 ?        00:00:00 [rcuob/1]
root        19     2  0 18:55 ?        00:00:00 [rcuob/2]
root        20     2  0 18:55 ?        00:00:00 [rcuob/3]
root        21     2  0 18:55 ?        00:00:00 [rcuob/4]
root        22     2  0 18:55 ?        00:00:00 [rcuob/5]
root        23     2  0 18:55 ?        00:00:00 [rcuob/6]
root        24     2  0 18:55 ?        00:00:00 [rcuob/7]
root        25     2  0 18:55 ?        00:00:00 [migration/0]
root        26     2  0 18:55 ?        00:00:00 [watchdog/0]
root        27     2  0 18:55 ?        00:00:00 [watchdog/1]
root        28     2  0 18:55 ?        00:00:00 [migration/1]
root        29     2  0 18:55 ?        00:00:00 [ksoftirqd/1]
root        31     2  0 18:55 ?        00:00:00 [kworker/1:0H]
root        32     2  0 18:55 ?        00:00:00 [watchdog/2]
root        33     2  0 18:55 ?        00:00:00 [migration/2]
root        34     2  0 18:55 ?        00:00:00 [ksoftirqd/2]
root        36     2  0 18:55 ?        00:00:00 [kworker/2:0H]
root        37     2  0 18:55 ?        00:00:00 [watchdog/3]
root        38     2  0 18:55 ?        00:00:00 [migration/3]
root        39     2  0 18:55 ?        00:00:00 [ksoftirqd/3]
root        40     2  0 18:55 ?        00:00:00 [kworker/3:0]
```

```
root        41      2   0 18:55 ?         00:00:00 [kworker/3:0H]
root        42      2   0 18:55 ?         00:00:00 [khelper]
root        43      2   0 18:55 ?         00:00:00 [kdevtmpfs]
root        44      2   0 18:55 ?         00:00:00 [netns]
root        45      2   0 18:55 ?         00:00:00 [writeback]
root        46      2   0 18:55 ?         00:00:00 [kintegrityd]
root        47      2   0 18:55 ?         00:00:00 [bioset]
root        48      2   0 18:55 ?         00:00:00 [kworker/u17:0]
root        49      2   0 18:55 ?         00:00:00 [kblockd]
root        50      2   0 18:55 ?         00:00:00 [ata_sff]
root        51      2   0 18:55 ?         00:00:00 [khubd]
root        52      2   0 18:55 ?         00:00:00 [md]
root        53      2   0 18:55 ?         00:00:00 [devfreq_wq]
root        55      2   0 18:55 ?         00:00:00 [kworker/1:1]
root        56      2   0 18:55 ?         00:00:00 [kworker/2:1]
root        57      2   0 18:55 ?         00:00:00 [kworker/3:1]
root        59      2   0 18:55 ?         00:00:00 [khungtaskd]
root        60      2   0 18:55 ?         00:00:00 [kswapd0]
root        61      2   0 18:55 ?         00:00:00 [ksmd]
root        62      2   0 18:55 ?         00:00:00 [khugepaged]
root        63      2   0 18:55 ?         00:00:00 [fsnotify_mark]
root        64      2   0 18:55 ?         00:00:00 [ecryptfs-kthrea]
root        65      2   0 18:55 ?         00:00:00 [crypto]
root        77      2   0 18:55 ?         00:00:00 [kthrotld]
root        79      2   0 18:55 ?         00:00:00 [scsi_eh_0]
root        80      2   0 18:55 ?         00:00:00 [scsi_eh_1]
root        82      2   0 18:55 ?         00:00:00 [scsi_eh_2]
root        83      2   0 18:55 ?         00:00:00 [scsi_eh_3]
root        86      2   0 18:55 ?         00:00:00 [kworker/u16:5]
root       105      2   0 18:55 ?         00:00:00 [deferwq]
root       106      2   0 18:55 ?         00:00:00 [charger_manager]
root       167      2   0 18:55 ?         00:00:00 [jbd2/sda8-8]
root       168      2   0 18:55 ?         00:00:00 [ext4-rsv-conver]
root       291      1   0 18:56 ?         00:00:00 upstart-udev-bridge --
daemon
root       297      1   0 18:56 ?         00:00:00 /lib/systemd/systemd-
udevd --dae
root       338      2   0 18:56 ?         00:00:00 [irq/46-mei_me]
root       352      2   0 18:56 ?         00:00:00 [edac-poller]
root       363      2   0 18:56 ?         00:00:00 [kvm-irqfd-clean]
root       364      2   0 18:56 ?         00:00:00 [hd-audio0]
root       442      1   0 18:56 ?         00:00:00 upstart-socket-bridge -
-daemon
root       498      1   0 18:56 ?         00:00:00 rpcbind
root       525      2   0 18:56 ?         00:00:00 [ttm_swap]
root       526      2   0 18:56 ?         00:00:00 [kworker/u17:1]
root       544      2   0 18:56 ?         00:00:00 [hd-audio1]
root       628      1   0 18:56 ?         00:00:00 upstart-file-bridge --
daemon
syslog     641      1   0 18:56 ?         00:00:00 rsyslogd
message+   646      1   0 18:56 ?         00:00:01 dbus-daemon --system --
fork
root       659      1   0 18:56 ?         00:00:00 /usr/sbin/ModemManager
root       677      1   0 18:56 ?         00:00:00 /usr/sbin/bluetoothd
root       684      2   0 18:56 ?         00:00:00 [krfcommd]
avahi      689      1   0 18:56 ?         00:00:00 avahi-daemon: running
[st06-lab3
```

```
root        696     1   0 18:56 ?          00:00:00 /lib/systemd/systemd-
logind
avahi       698   689   0 18:56 ?          00:00:00 avahi-daemon: chroot
helper
root        705     1   0 18:56 ?          00:00:00 ypbind -broadcast -no-
dbus
root        715     1   0 18:56 ?          00:00:00 NetworkManager
root        721     1   0 18:56 ?          00:00:01 /usr/lib/policykit-
1/polkitd --n
root        877     1   0 18:56 tty4       00:00:00 /sbin/getty -8 38400
tty4
root        881     1   0 18:56 tty5       00:00:00 /sbin/getty -8 38400
tty5
root        888     1   0 18:56 tty2       00:00:00 /sbin/getty -8 38400
tty2
root        889     1   0 18:56 tty3       00:00:00 /sbin/getty -8 38400
tty3
root        892     1   0 18:56 tty6       00:00:00 /sbin/getty -8 38400
tty6
root        936     1   0 18:56 ?          00:00:00 /usr/sbin/sshd -D
root        974     1   0 18:56 ?          00:00:00 acpid -c
/etc/acpi/events -s /va
root        977     1   0 18:56 ?          00:00:00 /usr/sbin/cups-browsed
root        998     1   0 18:56 ?          00:00:00 /usr/sbin/irqbalance
root       1000     1   0 18:56 ?          00:00:00 cron
whoopsie   1006     1   0 18:56 ?          00:00:00 whoopsie
root       1011     1   0 18:56 ?          00:00:00 /opt/pbis/sbin/lwsmd --
start-as-
root       1034  1011   0 18:56 ?          00:00:00 lw-container lwreg
root       1063  1011   0 18:56 ?          00:00:00 lw-container eventlog
root       1089  1011   0 18:56 ?          00:00:00 lw-container netlogon
root       1114  1011   0 18:56 ?          00:00:00 lw-container lwio
root       1141  1011   0 18:56 ?          00:00:01 lw-container lsass
root       1175  1011   0 18:56 ?          00:00:00 lw-container reapsysl
root       1232     1   0 18:56 ?          00:00:00 /usr/sbin/gpm -m
/dev/input/mice
kernoops   1261     1   0 18:56 ?          00:00:00 /usr/sbin/kerneloops
root       1319     1   0 18:56 tty1       00:00:00 /sbin/getty -8 38400
tty1
nobody     1325   715   0 18:56 ?          00:00:00 /usr/sbin/dnsmasq --no-
resolv --
root       1530     1   0 18:56 ?          00:00:00 /usr/sbin/cupsd -f
lp         1533  1530   0 18:56 ?          00:00:00
/usr/lib/cups/notifier/dbus dbus
root       1538     1   0 18:56 ?          00:00:00 lightdm
root       1550  1538   2 18:56 tty7       00:00:25 /usr/bin/X -core :0 -
seat seat0
root       1553     1   0 18:56 ?          00:00:00
/usr/lib/accountsservice/account
root       1612     2   0 18:56 ?          00:00:00 [kauditd]
root       1655  1538   0 18:56 ?          00:00:00 lightdm --session-child
12 19
root       1714     1   0 18:56 ?          00:00:00 /usr/lib/upower/upowerd
rtkit      1745     1   0 18:56 ?          00:00:00 /usr/lib/rtkit/rtkit-
daemon
root       2013     2   0 18:56 ?          00:00:00 [kworker/1:2]
root       2018     2   0 18:56 ?          00:00:00 [kworker/2:2]
root       2052     2   0 18:57 ?          00:00:00 [cifsiod]
```

```
root         2056     2  0 18:57 ?        00:00:00 [cifsd]
83642        2083     1  0 18:57 ?        00:00:00 /usr/bin/gnome-keyring-
daemon --
83642        2085  1655  0 18:57 ?        00:00:00 init --user
83642        2151  2085  0 18:57 ?        00:00:00 ssh-agent -s
83642        2157  2085  0 18:57 ?        00:00:00 dbus-daemon --fork --
session --a
83642        2166  2085  0 18:57 ?        00:00:00 upstart-event-bridge
83642        2172  2085  0 18:57 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/hud/wi
83642        2182  2085  0 18:57 ?        00:00:00 upstart-file-bridge --
daemon --u
83642        2184  2085  0 18:57 ?        00:00:00 upstart-dbus-bridge --
daemon --s
83642        2185  2085  0 18:57 ?        00:00:00 upstart-dbus-bridge --
daemon --s
83642        2187  2085  0 18:57 ?        00:00:03 /usr/bin/ibus-daemon --
daemonize
83642        2224  2085  0 18:57 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/bamf/b
83642        2229  2085  0 18:57 ?        00:00:00 /usr/lib/gvfs/gvfsd
83642        2233  2085  0 18:57 ?        00:00:00 /usr/lib/gvfs/gvfsd-
fuse /run/us
83642        2247  2085  0 18:57 ?        00:00:00 /usr/lib/dconf/dconf-
service
83642        2279  2187  0 18:57 ?        00:00:00 /usr/lib/ibus/ibus-
dconf
83642        2281  2187  0 18:57 ?        00:00:00 /usr/lib/ibus/ibus-ui-
gtk3
83642        2283  2085  0 18:57 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/gconf/
83642        2288  2085  0 18:57 ?        00:00:00 /usr/lib/ibus/ibus-x11
--kill-da
83642        2305  2187  0 18:57 ?        00:00:00 /usr/lib/ibus/ibus-
engine-simple
root         2314     2  0 18:57 ?        00:00:00 [kworker/0:2]
83642        2342  2085  0 18:57 ?        00:00:00 /usr/lib/unity-
settings-daemon/u
83642        2346  2085  0 18:57 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/hud/hu
83642        2351  2085  0 18:57 ?        00:00:00 /usr/lib/at-spi2-
core/at-spi-bus
83642        2352  2085  0 18:57 ?        00:00:00 gnome-session --
session=ubuntu
83642        2354  2085  0 18:57 ?        00:00:00 /usr/lib/unity/unity-
panel-servi
83642        2358  2351  0 18:57 ?        00:00:00 /bin/dbus-daemon --
config-file=/
83642        2372  2085  0 18:57 ?        00:00:00 /usr/lib/at-spi2-
core/at-spi2-re
83642        2381  2085  0 18:57 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642        2383  2085  0 18:57 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642        2384  2085  0 18:57 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642        2387  2085  0 18:57 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/indica
```

```
83642     2388  2085  0 18:57 ?          00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642     2395  2085  0 18:57 ?          00:00:01 /usr/lib/x86_64-linux-
gnu/indica
83642     2396  2085  0 18:57 ?          00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642     2411  2085  0 18:57 ?          00:00:00 /usr/lib/x86_64-linux-
gnu/notify
83642     2462  2085  0 18:57 ?          00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642     2470  2085  0 18:57 ?          00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642     2488  2085  0 18:57 ?          00:00:00
/usr/lib/evolution/evolution-sou
colord    2569     1  0 18:57 ?          00:00:00 /usr/lib/colord/colord
83642     2817  2352  1 18:57 ?          00:00:17 compiz
83642     2854  2085  0 18:57 ?          00:00:00
/usr/lib/evolution/evolution-cal
83642     2871  2085  0 18:57 ?          00:00:00 /usr/lib/gvfs/gvfsd-
metadata
83642     2877  2352  0 18:57 ?          00:00:00 /usr/lib/policykit-1-
gnome/polki
83642     2879  2352  0 18:57 ?          00:00:00 nm-applet
83642     2880  2352  0 18:57 ?          00:00:00 /usr/lib/unity-
settings-daemon/u
83642     2882  2352  0 18:57 ?          00:00:02 nautilus -n
83642     2897  2085  0 18:57 ?          00:00:00 /usr/lib/gvfs/gvfs-
udisks2-volum
root      2902     1  0 18:57 ?          00:00:00
/usr/lib/udisks2/udisksd --no-de
83642     2915  2085  0 18:57 ?          00:00:00 /usr/lib/gvfs/gvfs-
gphoto2-volum
83642     2926  2085  0 18:57 ?          00:00:00 /usr/lib/gvfs/gvfs-mtp-
volume-mo
83642     2931  2085  0 18:57 ?          00:00:00 /usr/lib/gvfs/gvfs-afc-
volume-mo
83642     2973  2085  0 18:57 ?          00:00:00 /usr/lib/gvfs/gvfsd-
trash --spaw
83642     2985  2085  0 18:57 ?          00:00:00 /usr/lib/gvfs/gvfsd-
burn --spawn
83642     3012  2352  0 18:57 ?          00:00:00 telepathy-indicator
83642     3024  2085  0 18:57 ?          00:00:00
/usr/lib/telepathy/mission-contr
83642     3047  2352  0 18:57 ?          00:00:00 zeitgeist-datahub
83642     3052  2085  0 18:57 ?          00:00:00 /usr/bin/zeitgeist-
daemon
83642     3058  2085  0 18:57 ?          00:00:00 /usr/lib/x86_64-linux-
gnu/zeitge
83642     3080  3058  0 18:57 ?          00:00:00 /bin/cat
83642     3120  2085  3 18:57 ?          00:00:28
/usr/lib/firefox/firefox
83642     3148  2085  0 18:57 ?          00:00:00 /usr/lib/libunity-
webapps/unity-
83642     3256  2352  0 18:58 ?          00:00:00 update-notifier
83642     3393  2352  0 18:59 ?          00:00:00 /usr/lib/x86_64-linux-
gnu/deja-d
83642     3661  2085  0 19:01 ?          00:00:00 /usr/lib/x86_64-linux-
gnu/unity-
```

```
83642      3673  2085  0 19:01 ?          00:00:00 /usr/bin/unity-scope-
loader appl
83642      3677  2085  0 19:01 ?          00:00:00 /usr/lib/x86_64-linux-
gnu/unity-
83642      3721  2085  0 19:01 ?          00:00:00 /usr/lib/x86_64-linux-
gnu/unity-
83642      3737  2085  0 19:01 ?          00:00:05 gnome-terminal
83642      3744  3737  0 19:01 ?          00:00:00 gnome-pty-helper
83642      3745  3737  0 19:01 pts/1      00:00:00 bash
root       4283     2  0 19:04 ?          00:00:00 [kworker/u16:1]
83642      4298  2085  0 19:04 ?          00:00:02 gedit
/home/83642/Pulpit/wyniki
root       4315     2  0 19:04 ?          00:00:00 [kworker/0:0]
83642      4834  3737  0 19:08 pts/4      00:00:00 bash
83642      5521  3745  0 19:13 pts/1      00:00:00 ./z3b
83642      5522  5521  0 19:13 pts/1      00:00:00 [z3b] <defunct>
83642      5527  4834  0 19:13 pts/4      00:00:00 ps -efa
```

Zadanie 4

Zastosować funkcję wait odbierając wynik zakończenia procesu potomnego. Sprawdzić zachowanie się obu procesów. Proces potomny powinien zwrócić wartość inną niż 0 np. exit(2). Wyświetlić co odbierze wait w sposób **niesformatowany** (nie używać WEXITSTATUS czy przesunięć bitowych).

```c
#include <stdio.h>
#include <stdlib.h>
main()
{
int childpid;
int status=1;
int zakonczono;
printf("startuje proces macierzysty pid %d\n",getpid());
if ((childpid = fork()) == -1)
    {
    perror("nie moge forknac");
    exit(1);
    }
else
    if (childpid ==0 )
        {
        printf("Proces potomny o pidzie %d z rodzica
%d\n",getpid(),getppid());
        sleep(10);
        exit(2);
        }
    else
        {
        wait(&status);
printf("Proces macierzysty o pidzie %d i dziecku
%d\n",getpid(),childpid);
        printf("Status %d\n",status);
        }
return 0;
}
```

```
Wynik:
83642@st06-lab319:~$ ./z4
startuje proces macierzysty pid 6571
Proces potomny o pidzie 6572 z rodzica 6571
Proces macierzysty o pidzie 6571 i dziecku 6572
Status 512
```

Zadanie 5

Stworzyć n=5 procesów potomnych z jednego procesu macierzystego.
Zastosować funkcję wait do poprawnego zakończenia. Każdy potomek powinien
zatrzymać się na 5 sekund (sleep) by na drugiej konsoli sprawdzić za pomocą ps
-efa czy udało się wygenerować dokładnie 5 potomków (ps powinien pokazać 5
procesów potomnych). Procesy powinny zaczynać się razem i kończyć razem.
Zastosować pętlę zamiast konstrukcji if else if else ...

```c
#include <stdio.h>
#include <stdlib.h>
main()
{
int childpid;
int status=1;
int zakonczono;
printf("startuje proces macierzysty pid %d\n",getpid());
int i;

for(i=0;i<5;i++){

if ((childpid = fork()) == -1)
    {
    perror("nie moge forknac");
    exit(1);
    }
else
    if (childpid ==0 )
        {
        printf("Proces potomny o pidzie %d z rodzica
%d\n",getpid(),getppid());
        sleep(5);
        exit(2);
}
}
        int j;
        for(j=0;j<5;j++){
        wait();
        }
exit(0);
}
```

```
Wynik:
83642@st06-lab319:~$ ./z5
startuje proces macierzysty pid 8179
Proces potomny o pidzie 8180 z rodzica 8179
Proces potomny o pidzie 8181 z rodzica 8179
Proces potomny o pidzie 8182 z rodzica 8179
```

```
Proces potomny o pidzie 8183 z rodzica 8179
Proces potomny o pidzie 8184 z rodzica 8179

83642@st06-lab319:~$ ps -efa
UID         PID  PPID  C STIME TTY          TIME CMD
root          1     0  0 18:55 ?        00:00:01 /sbin/init
root          2     0  0 18:55 ?        00:00:00 [kthreadd]
root          3     2  0 18:55 ?        00:00:00 [ksoftirqd/0]
root          5     2  0 18:55 ?        00:00:00 [kworker/0:0H]
root          7     2  0 18:55 ?        00:00:01 [rcu_sched]
root          8     2  0 18:55 ?        00:00:00 [rcuos/0]
root          9     2  0 18:55 ?        00:00:01 [rcuos/1]
root         10     2  0 18:55 ?        00:00:01 [rcuos/2]
root         11     2  0 18:55 ?        00:00:01 [rcuos/3]
root         12     2  0 18:55 ?        00:00:00 [rcuos/4]
root         13     2  0 18:55 ?        00:00:00 [rcuos/5]
root         14     2  0 18:55 ?        00:00:00 [rcuos/6]
root         15     2  0 18:55 ?        00:00:00 [rcuos/7]
root         16     2  0 18:55 ?        00:00:00 [rcu_bh]
root         17     2  0 18:55 ?        00:00:00 [rcuob/0]
root         18     2  0 18:55 ?        00:00:00 [rcuob/1]
root         19     2  0 18:55 ?        00:00:00 [rcuob/2]
root         20     2  0 18:55 ?        00:00:00 [rcuob/3]
root         21     2  0 18:55 ?        00:00:00 [rcuob/4]
root         22     2  0 18:55 ?        00:00:00 [rcuob/5]
root         23     2  0 18:55 ?        00:00:00 [rcuob/6]
root         24     2  0 18:55 ?        00:00:00 [rcuob/7]
root         25     2  0 18:55 ?        00:00:00 [migration/0]
root         26     2  0 18:55 ?        00:00:00 [watchdog/0]
root         27     2  0 18:55 ?        00:00:00 [watchdog/1]
root         28     2  0 18:55 ?        00:00:00 [migration/1]
root         29     2  0 18:55 ?        00:00:00 [ksoftirqd/1]
root         31     2  0 18:55 ?        00:00:00 [kworker/1:0H]
root         32     2  0 18:55 ?        00:00:00 [watchdog/2]
root         33     2  0 18:55 ?        00:00:00 [migration/2]
root         34     2  0 18:55 ?        00:00:00 [ksoftirqd/2]
root         36     2  0 18:55 ?        00:00:00 [kworker/2:0H]
root         37     2  0 18:55 ?        00:00:00 [watchdog/3]
root         38     2  0 18:55 ?        00:00:00 [migration/3]
root         39     2  0 18:55 ?        00:00:00 [ksoftirqd/3]
root         40     2  0 18:55 ?        00:00:00 [kworker/3:0]
root         41     2  0 18:55 ?        00:00:00 [kworker/3:0H]
root         42     2  0 18:55 ?        00:00:00 [khelper]
root         43     2  0 18:55 ?        00:00:00 [kdevtmpfs]
root         44     2  0 18:55 ?        00:00:00 [netns]
root         45     2  0 18:55 ?        00:00:00 [writeback]
root         46     2  0 18:55 ?        00:00:00 [kintegrityd]
root         47     2  0 18:55 ?        00:00:00 [bioset]
root         48     2  0 18:55 ?        00:00:00 [kworker/u17:0]
root         49     2  0 18:55 ?        00:00:00 [kblockd]
root         50     2  0 18:55 ?        00:00:00 [ata_sff]
root         51     2  0 18:55 ?        00:00:00 [khubd]
root         52     2  0 18:55 ?        00:00:00 [md]
root         53     2  0 18:55 ?        00:00:00 [devfreq_wq]
root         55     2  0 18:55 ?        00:00:01 [kworker/1:1]
root         56     2  0 18:55 ?        00:00:00 [kworker/2:1]
root         57     2  0 18:55 ?        00:00:00 [kworker/3:1]
root         59     2  0 18:55 ?        00:00:00 [khungtaskd]
```

```
root          60      2   0 18:55 ?           00:00:00 [kswapd0]
root          61      2   0 18:55 ?           00:00:00 [ksmd]
root          62      2   0 18:55 ?           00:00:00 [khugepaged]
root          63      2   0 18:55 ?           00:00:00 [fsnotify_mark]
root          64      2   0 18:55 ?           00:00:00 [ecryptfs-kthrea]
root          65      2   0 18:55 ?           00:00:00 [crypto]
root          77      2   0 18:55 ?           00:00:00 [kthrotld]
root          79      2   0 18:55 ?           00:00:00 [scsi_eh_0]
root          80      2   0 18:55 ?           00:00:00 [scsi_eh_1]
root          82      2   0 18:55 ?           00:00:00 [scsi_eh_2]
root          83      2   0 18:55 ?           00:00:00 [scsi_eh_3]
root         105      2   0 18:55 ?           00:00:00 [deferwq]
root         106      2   0 18:55 ?           00:00:00 [charger_manager]
root         167      2   0 18:55 ?           00:00:00 [jbd2/sda8-8]
root         168      2   0 18:55 ?           00:00:00 [ext4-rsv-conver]
root         291      1   0 18:56 ?           00:00:00 upstart-udev-bridge --
daemon
root         297      1   0 18:56 ?           00:00:00 /lib/systemd/systemd-
udevd --dae
root         338      2   0 18:56 ?           00:00:00 [irq/46-mei_me]
root         352      2   0 18:56 ?           00:00:00 [edac-poller]
root         363      2   0 18:56 ?           00:00:00 [kvm-irqfd-clean]
root         364      2   0 18:56 ?           00:00:00 [hd-audio0]
root         442      1   0 18:56 ?           00:00:00 upstart-socket-bridge -
-daemon
root         498      1   0 18:56 ?           00:00:00 rpcbind
root         525      2   0 18:56 ?           00:00:00 [ttm_swap]
root         526      2   0 18:56 ?           00:00:00 [kworker/u17:1]
root         544      2   0 18:56 ?           00:00:00 [hd-audio1]
root         628      1   0 18:56 ?           00:00:00 upstart-file-bridge --
daemon
syslog       641      1   0 18:56 ?           00:00:00 rsyslogd
message+     646      1   0 18:56 ?           00:00:02 dbus-daemon --system --
fork
root         659      1   0 18:56 ?           00:00:00 /usr/sbin/ModemManager
root         677      1   0 18:56 ?           00:00:00 /usr/sbin/bluetoothd
root         684      2   0 18:56 ?           00:00:00 [krfcommd]
avahi        689      1   0 18:56 ?           00:00:00 avahi-daemon: running
[st06-lab3
root         696      1   0 18:56 ?           00:00:00 /lib/systemd/systemd-
logind
avahi        698    689   0 18:56 ?           00:00:00 avahi-daemon: chroot
helper
root         705      1   0 18:56 ?           00:00:00 ypbind -broadcast -no-
dbus
root         715      1   0 18:56 ?           00:00:00 NetworkManager
root         721      1   0 18:56 ?           00:00:03 /usr/lib/policykit-
1/polkitd --n
root         877      1   0 18:56 tty4        00:00:00 /sbin/getty -8 38400
tty4
root         881      1   0 18:56 tty5        00:00:00 /sbin/getty -8 38400
tty5
root         888      1   0 18:56 tty2        00:00:00 /sbin/getty -8 38400
tty2
root         889      1   0 18:56 tty3        00:00:00 /sbin/getty -8 38400
tty3
root         892      1   0 18:56 tty6        00:00:00 /sbin/getty -8 38400
tty6
```

```
root        936     1  0 18:56 ?         00:00:00 /usr/sbin/sshd -D
root        974     1  0 18:56 ?         00:00:00 acpid -c
/etc/acpi/events -s /va
root        977     1  0 18:56 ?         00:00:00 /usr/sbin/cups-browsed
root        998     1  0 18:56 ?         00:00:00 /usr/sbin/irqbalance
root       1000     1  0 18:56 ?         00:00:00 cron
whoopsie   1006     1  0 18:56 ?         00:00:00 whoopsie
root       1011     1  0 18:56 ?         00:00:00 /opt/pbis/sbin/lwsmd --
start-as-
root       1034  1011  0 18:56 ?         00:00:00 lw-container lwreg
root       1063  1011  0 18:56 ?         00:00:00 lw-container eventlog
root       1089  1011  0 18:56 ?         00:00:00 lw-container netlogon
root       1114  1011  0 18:56 ?         00:00:00 lw-container lwio
root       1141  1011  0 18:56 ?         00:00:02 lw-container lsass
root       1175  1011  0 18:56 ?         00:00:00 lw-container reapsysl
root       1232     1  0 18:56 ?         00:00:00 /usr/sbin/gpm -m
/dev/input/mice
kernoops   1261     1  0 18:56 ?         00:00:00 /usr/sbin/kerneloops
root       1319     1  0 18:56 tty1      00:00:00 /sbin/getty -8 38400
tty1
nobody     1325   715  0 18:56 ?         00:00:00 /usr/sbin/dnsmasq --no-
resolv --
root       1530     1  0 18:56 ?         00:00:00 /usr/sbin/cupsd -f
lp         1533  1530  0 18:56 ?         00:00:00
/usr/lib/cups/notifier/dbus dbus
root       1538     1  0 18:56 ?         00:00:00 lightdm
root       1550  1538  1 18:56 tty7      00:00:38 /usr/bin/X -core :0 -
seat seat0
root       1553     1  0 18:56 ?         00:00:00
/usr/lib/accountsservice/account
root       1612     2  0 18:56 ?         00:00:00 [kauditd]
root       1655  1538  0 18:56 ?         00:00:00 lightdm --session-child
12 19
root       1714     1  0 18:56 ?         00:00:00 /usr/lib/upower/upowerd
rtkit      1745     1  0 18:56 ?         00:00:01 /usr/lib/rtkit/rtkit-
daemon
root       2013     2  0 18:56 ?         00:00:00 [kworker/1:2]
root       2018     2  0 18:56 ?         00:00:00 [kworker/2:2]
root       2052     2  0 18:57 ?         00:00:00 [cifsiod]
root       2056     2  0 18:57 ?         00:00:01 [cifsd]
83642      2083     1  0 18:57 ?         00:00:00 /usr/bin/gnome-keyring-
daemon --
83642      2085  1655  0 18:57 ?         00:00:00 init --user
83642      2151  2085  0 18:57 ?         00:00:00 ssh-agent -s
83642      2157  2085  0 18:57 ?         00:00:00 dbus-daemon --fork --
session --a
83642      2166  2085  0 18:57 ?         00:00:00 upstart-event-bridge
83642      2172  2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/hud/wi
83642      2182  2085  0 18:57 ?         00:00:00 upstart-file-bridge --
daemon --u
83642      2184  2085  0 18:57 ?         00:00:00 upstart-dbus-bridge --
daemon --s
83642      2185  2085  0 18:57 ?         00:00:00 upstart-dbus-bridge --
daemon --s
83642      2187  2085  0 18:57 ?         00:00:10 /usr/bin/ibus-daemon --
daemonize
```

```
83642      2224   2085  0 18:57 ?         00:00:01 /usr/lib/x86_64-linux-
gnu/bamf/b
83642      2229   2085  0 18:57 ?         00:00:00 /usr/lib/gvfs/gvfsd
83642      2233   2085  0 18:57 ?         00:00:00 /usr/lib/gvfs/gvfsd-
fuse /run/us
83642      2247   2085  0 18:57 ?         00:00:00 /usr/lib/dconf/dconf-
service
83642      2279   2187  0 18:57 ?         00:00:00 /usr/lib/ibus/ibus-
dconf
83642      2281   2187  0 18:57 ?         00:00:02 /usr/lib/ibus/ibus-ui-
gtk3
83642      2283   2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/gconf/
83642      2288   2085  0 18:57 ?         00:00:00 /usr/lib/ibus/ibus-x11
--kill-da
83642      2305   2187  0 18:57 ?         00:00:03 /usr/lib/ibus/ibus-
engine-simple
root       2314      2  0 18:57 ?         00:00:00 [kworker/0:2]
83642      2342   2085  0 18:57 ?         00:00:00 /usr/lib/unity-
settings-daemon/u
83642      2346   2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/hud/hu
83642      2351   2085  0 18:57 ?         00:00:00 /usr/lib/at-spi2-
core/at-spi-bus
83642      2352   2085  0 18:57 ?         00:00:00 gnome-session --
session=ubuntu
83642      2354   2085  0 18:57 ?         00:00:01 /usr/lib/unity/unity-
panel-servi
83642      2358   2351  0 18:57 ?         00:00:00 /bin/dbus-daemon --
config-file=/
83642      2372   2085  0 18:57 ?         00:00:00 /usr/lib/at-spi2-
core/at-spi2-re
83642      2381   2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642      2383   2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642      2384   2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642      2387   2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642      2388   2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642      2395   2085  0 18:57 ?         00:00:03 /usr/lib/x86_64-linux-
gnu/indica
83642      2396   2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642      2411   2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/notify
83642      2462   2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642      2470   2085  0 18:57 ?         00:00:00 /usr/lib/x86_64-linux-
gnu/indica
83642      2488   2085  0 18:57 ?         00:00:00
/usr/lib/evolution/evolution-sou
colord     2569      1  0 18:57 ?         00:00:00 /usr/lib/colord/colord
83642      2817   2352  1 18:57 ?         00:00:25 compiz
83642      2854   2085  0 18:57 ?         00:00:00
/usr/lib/evolution/evolution-cal
```

```
83642      2871   2085  0 18:57 ?        00:00:00 /usr/lib/gvfs/gvfsd-
metadata
83642      2877   2352  0 18:57 ?        00:00:00 /usr/lib/policykit-1-
gnome/polki
83642      2879   2352  0 18:57 ?        00:00:00 nm-applet
83642      2880   2352  0 18:57 ?        00:00:00 /usr/lib/unity-
settings-daemon/u
83642      2882   2352  0 18:57 ?        00:00:02 nautilus -n
83642      2897   2085  0 18:57 ?        00:00:00 /usr/lib/gvfs/gvfs-
udisks2-volum
root       2902      1  0 18:57 ?        00:00:00
/usr/lib/udisks2/udisksd --no-de
83642      2915   2085  0 18:57 ?        00:00:00 /usr/lib/gvfs/gvfs-
gphoto2-volum
83642      2926   2085  0 18:57 ?        00:00:00 /usr/lib/gvfs/gvfs-mtp-
volume-mo
83642      2931   2085  0 18:57 ?        00:00:00 /usr/lib/gvfs/gvfs-afc-
volume-mo
83642      2973   2085  0 18:57 ?        00:00:00 /usr/lib/gvfs/gvfsd-
trash --spaw
83642      2985   2085  0 18:57 ?        00:00:00 /usr/lib/gvfs/gvfsd-
burn --spawn
83642      3012   2352  0 18:57 ?        00:00:00 telepathy-indicator
83642      3024   2085  0 18:57 ?        00:00:00
/usr/lib/telepathy/mission-contr
83642      3047   2352  0 18:57 ?        00:00:00 zeitgeist-datahub
83642      3052   2085  0 18:57 ?        00:00:00 /usr/bin/zeitgeist-
daemon
83642      3058   2085  0 18:57 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/zeitge
83642      3080   3058  0 18:57 ?        00:00:00 /bin/cat
83642      3120   2085  1 18:57 ?        00:00:32
/usr/lib/firefox/firefox
83642      3148   2085  0 18:57 ?        00:00:00 /usr/lib/libunity-
webapps/unity-
83642      3256   2352  0 18:58 ?        00:00:00 update-notifier
83642      3393   2352  0 18:59 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/deja-d
83642      3661   2085  0 19:01 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/unity-
83642      3673   2085  0 19:01 ?        00:00:00 /usr/bin/unity-scope-
loader appl
83642      3677   2085  0 19:01 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/unity-
83642      3721   2085  0 19:01 ?        00:00:00 /usr/lib/x86_64-linux-
gnu/unity-
83642      3737   2085  0 19:01 ?        00:00:13 gnome-terminal
83642      3744   3737  0 19:01 ?        00:00:00 gnome-pty-helper
83642      3745   3737  0 19:01 pts/1    00:00:00 bash
root       4283      2  0 19:04 ?        00:00:00 [kworker/u16:1]
83642      4298   2085  0 19:04 ?        00:00:04 gedit
/home/83642/Pulpit/wyniki
root       4315      2  0 19:04 ?        00:00:00 [kworker/0:0]
83642      4834   3737  0 19:08 pts/4    00:00:00 bash
root       6551      2  0 19:21 ?        00:00:00 [kworker/u16:0]
83642      8179   3745  0 19:33 pts/1    00:00:00 ./z5
83642      8180   8179  0 19:33 pts/1    00:00:00 ./z5
83642      8181   8179  0 19:33 pts/1    00:00:00 ./z5
```

```
83642      8182  8179  0 19:33 pts/1     00:00:00 ./z5
83642      8183  8179  0 19:33 pts/1     00:00:00 ./z5
83642      8184  8179  0 19:33 pts/1     00:00:00 ./z5
83642      8189  4834  0 19:34 pts/4     00:00:00 ps -efa
```

Zadanie 7

Przykład przechwycenia sygnału SIGCHLD - wysyłanego przez dziecko w momencie zakończenia się. Zastosować poniższy przykład w dowolnym z wykonanych programów.

```
#include <stdio.h>
#include <stdlib.h>
#include  <signal.h>

void oblsluga_zakonczenia_dziecka(int nr_sig)
{
printf("Rodzic już się dowiedział o zakończeniu procesu
%d\n",wait(NULL));
}

main()
{
signal(SIGCHLD,oblsluga_zakonczenia_dziecka);
int childpid;
int status=1;
int zakonczono;
printf("startuje proces macierzysty pid %d\n",getpid());
if ((childpid = fork()) == -1)
    {
    perror("nie moge forknac");
    exit(1);
    }
else
    if (childpid ==0 )
 {
        printf("Proces potomny o pidzie %d z rodzica
%d\n",getpid(),getppid());
        }
    else
        {
        sleep(10);
        printf("Proces macierzysty o pidzie %d i dziecku
%d\n",getpid(),childpid);
        }
exit(0);
}

Wynik:
83642@st06-lab319:~$ ./z7
startuje proces macierzysty pid 8997
Proces potomny o pidzie 8998 z rodzica 8997
Rodzic już się dowiedział o zakończeniu procesu 8998
Proces macierzysty o pidzie 8997 i dziecku 8998
```

Wnioski

Zajęcia pozwoliły na przypomnienie sobie informacji dotyczących tworzenia procesów. Udało mi się zrealizować wszystkie zadania poza zadaniem 6 z powodu błędów napisanego programu.