Übungsprotokoll

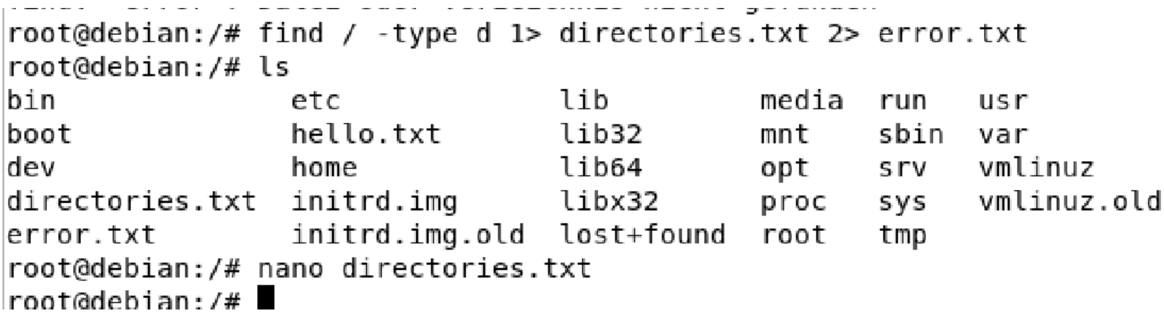
SYTB – Systemtechnik Betriebssysteme

htlkrems Bautechnik & IT	**Übungsdatum:** KW /2021 – KW /2021	**Klasse:** 3AHIT	**Name:** Felix Schneider
	Abgabedatum: dd.mm.yyyy	**Gruppe:** SYTB_2	**Note:**
Leitung: DI (FH) Alexander MESTL	**Mitübende:** -		

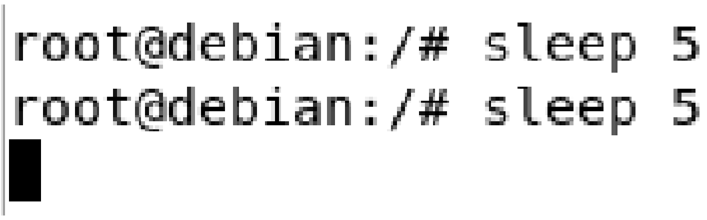
Übungsbezeichnung:

Debian Server

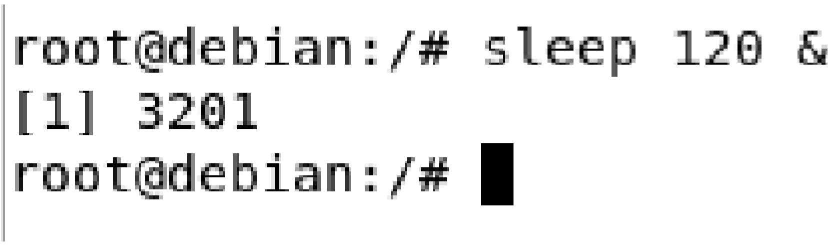
Inhaltsverzeichnis:



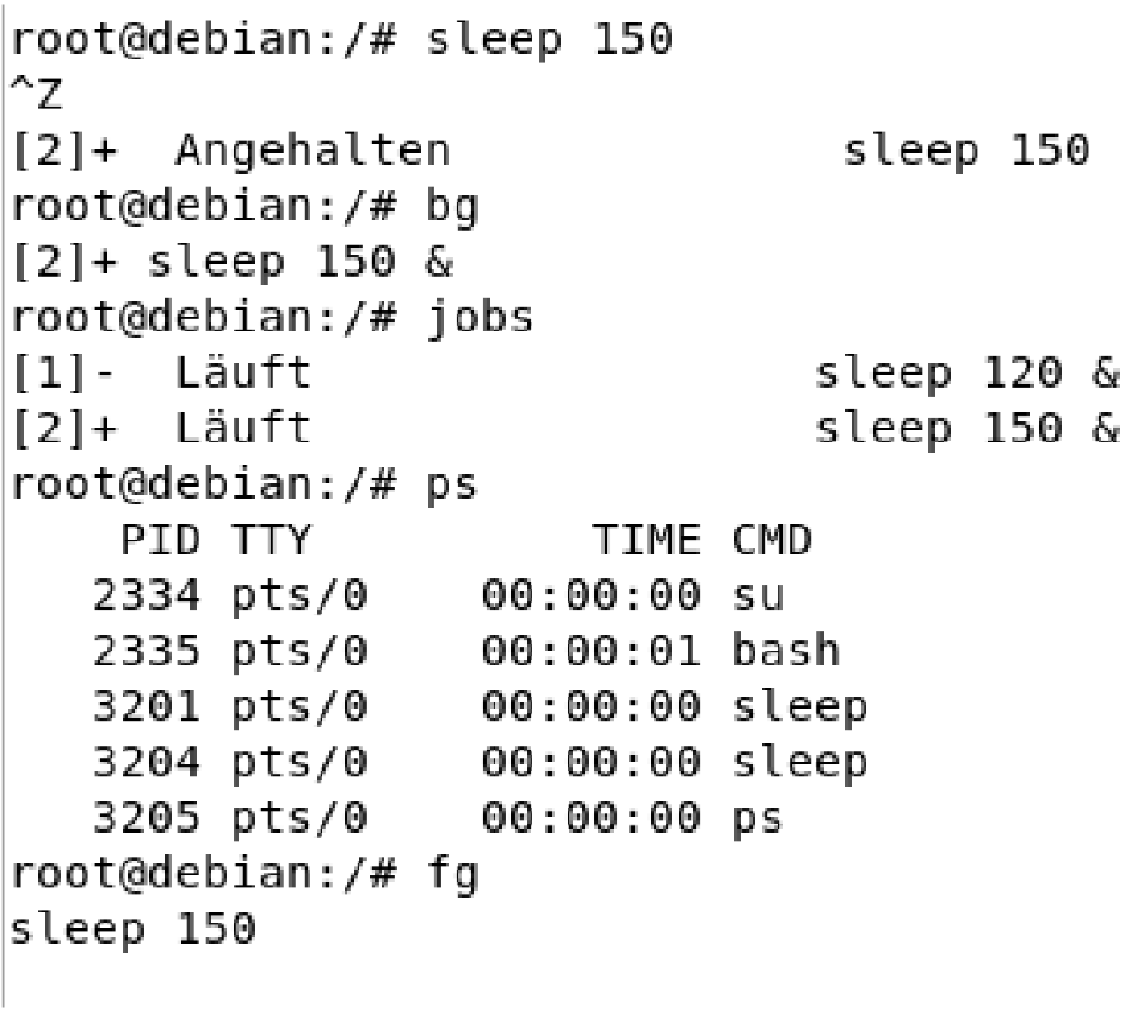
```
root@debian:/# find / -type d 1> directories.txt 2> error.txt
root@debian:/# ls
bin              etc             lib         media  run   usr
boot             hello.txt       lib32       mnt    sbin  var
dev              home            lib64       opt    srv   vmlinuz
directories.txt  initrd.img      libx32      proc   sys   vmlinuz.old
error.txt        initrd.img.old  lost+found  root   tmp
root@debian:/# nano directories.txt
root@debian:/# █
```



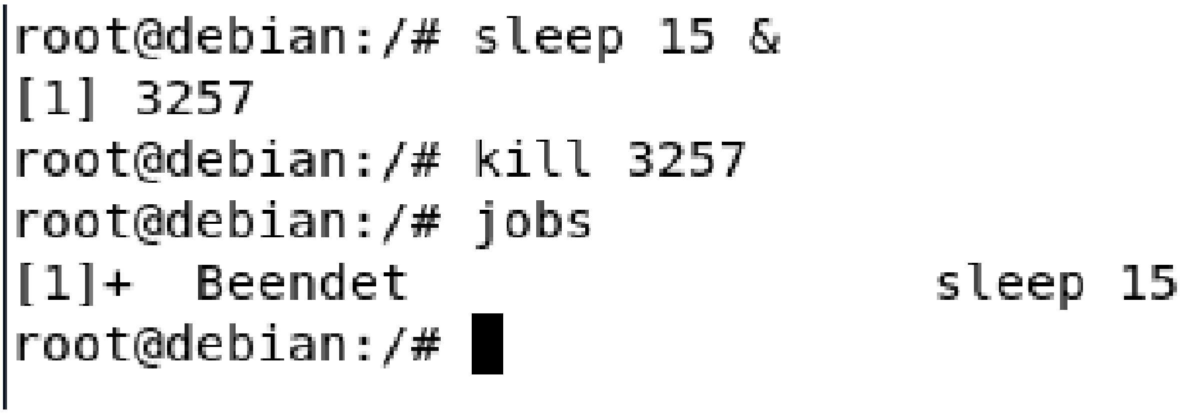
```
root@debian:/# sleep 5
root@debian:/# sleep 5
█
```



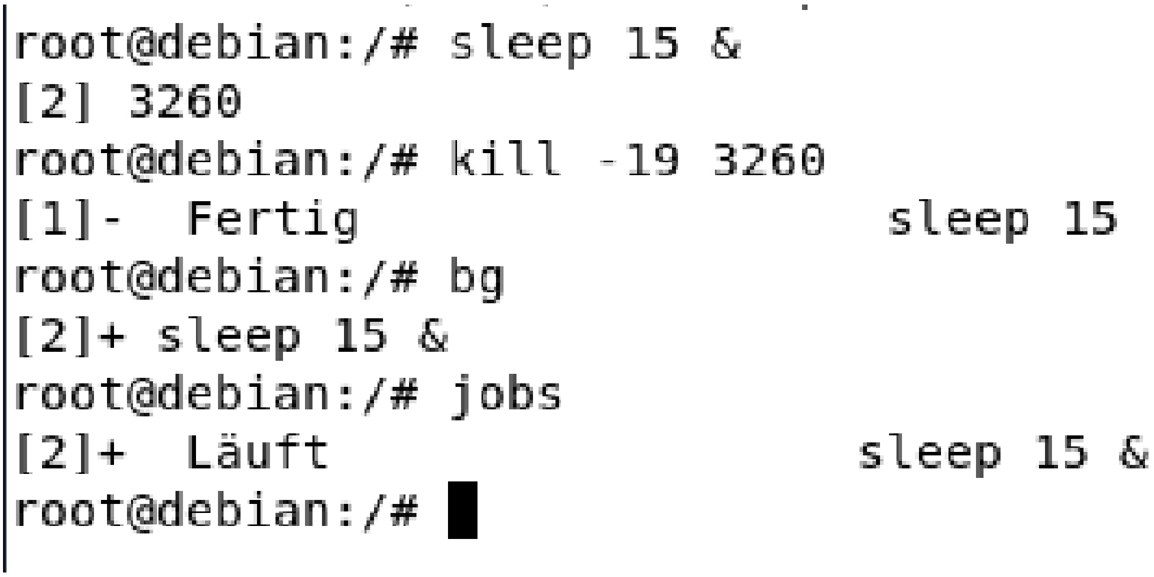
```
root@debian:/# sleep 120 &
[1] 3201
root@debian:/# █
```



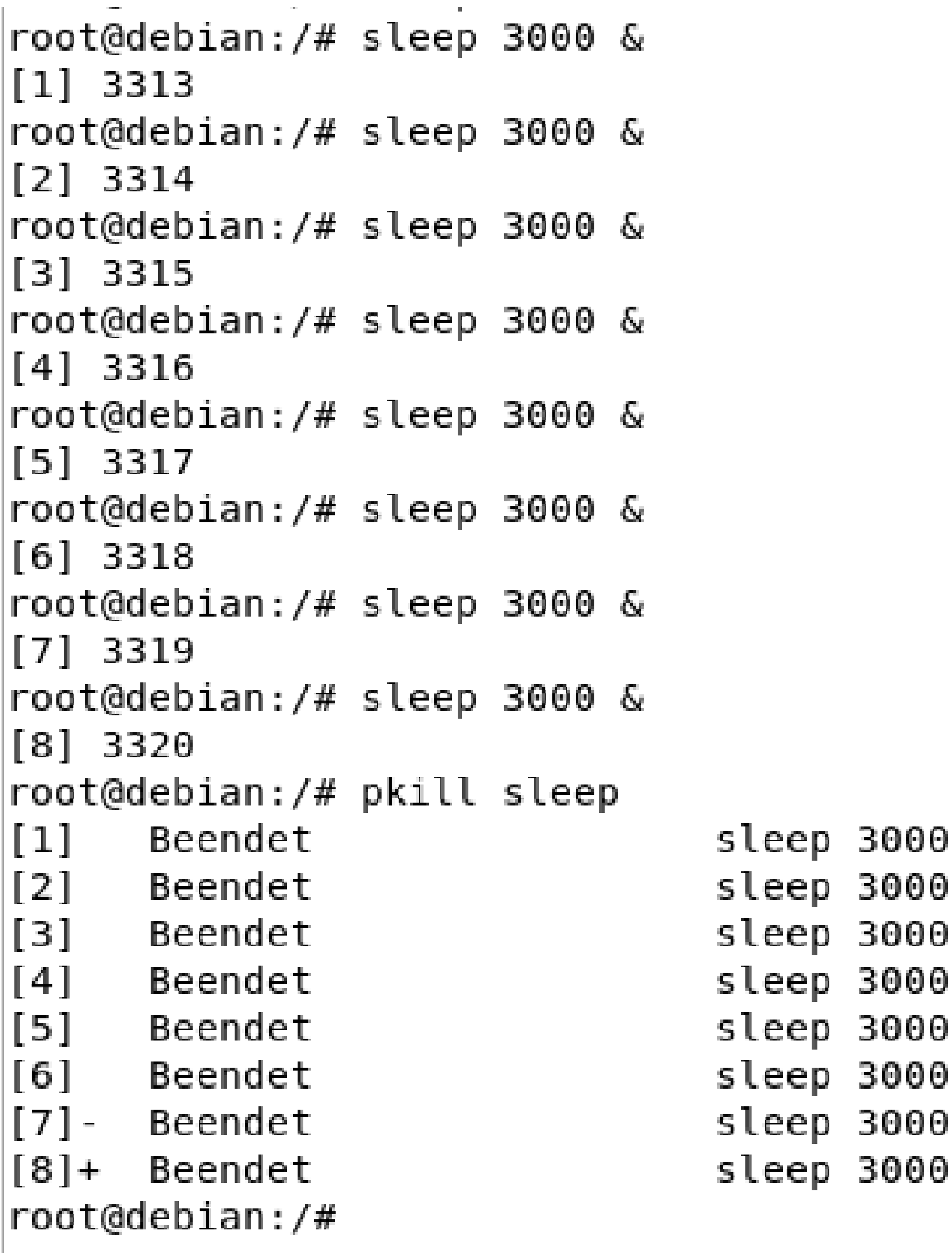
```
root@debian:/# sleep 150
^Z
[2]+  Angehalten                    sleep 150
root@debian:/# bg
[2]+ sleep 150 &
root@debian:/# jobs
[1]-  Läuft                        sleep 120 &
[2]+  Läuft                        sleep 150 &
root@debian:/# ps
    PID TTY          TIME CMD
   2334 pts/0    00:00:00 su
   2335 pts/0    00:00:01 bash
   3201 pts/0    00:00:00 sleep
   3204 pts/0    00:00:00 sleep
   3205 pts/0    00:00:00 ps
root@debian:/# fg
sleep 150
```



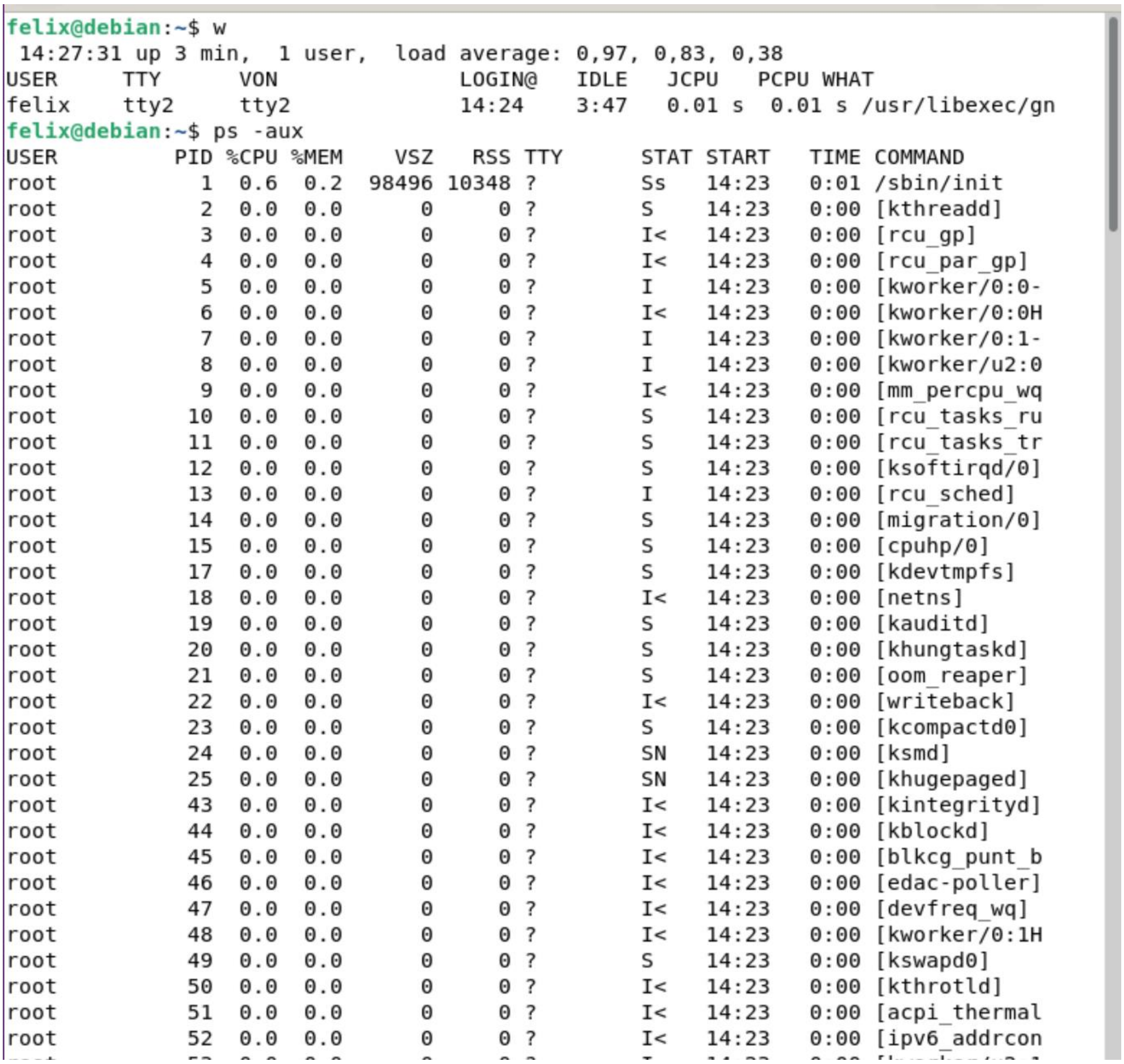
```
root@debian:/# sleep 15 &
[1] 3257
root@debian:/# kill 3257
root@debian:/# jobs
[1]+  Beendet                    sleep 15
root@debian:/# █
```



```
root@debian:/# sleep 15 &
[2] 3260
root@debian:/# kill -19 3260
[1]-  Fertig                       sleep 15
root@debian:/# bg
[2]+ sleep 15 &
root@debian:/# jobs
[2]+  Läuft                       sleep 15 &
root@debian:/# 
```

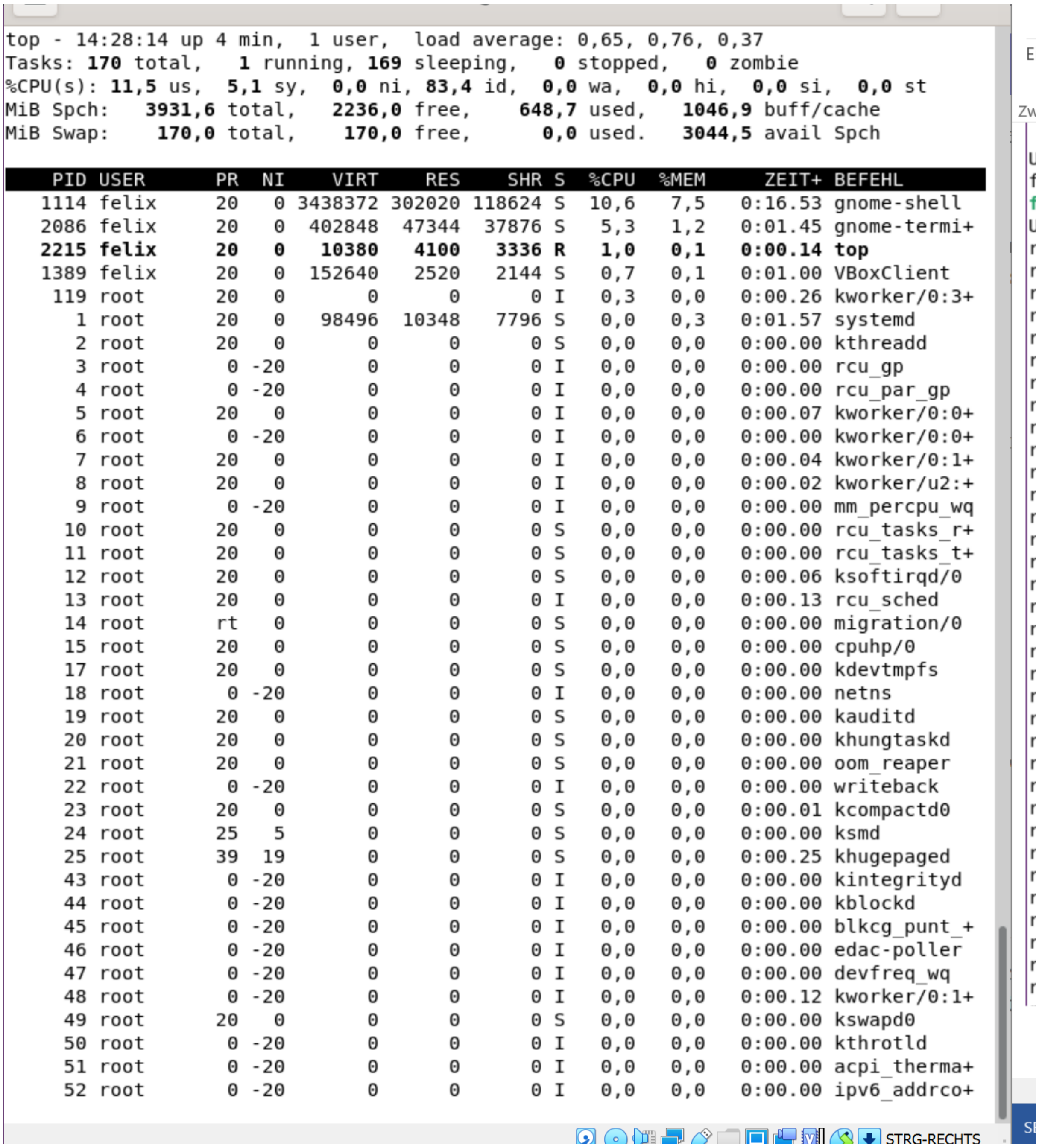


```
root@debian:/# sleep 3000 &
[1] 3313
root@debian:/# sleep 3000 &
[2] 3314
root@debian:/# sleep 3000 &
[3] 3315
root@debian:/# sleep 3000 &
[4] 3316
root@debian:/# sleep 3000 &
[5] 3317
root@debian:/# sleep 3000 &
[6] 3318
root@debian:/# sleep 3000 &
[7] 3319
root@debian:/# sleep 3000 &
[8] 3320
root@debian:/# pkill sleep
[1]   Beendet                  sleep 3000
[2]   Beendet                  sleep 3000
[3]   Beendet                  sleep 3000
[4]   Beendet                  sleep 3000
[5]   Beendet                  sleep 3000
[6]   Beendet                  sleep 3000
[7]-  Beendet                  sleep 3000
[8]+  Beendet                  sleep 3000
root@debian:/#
```



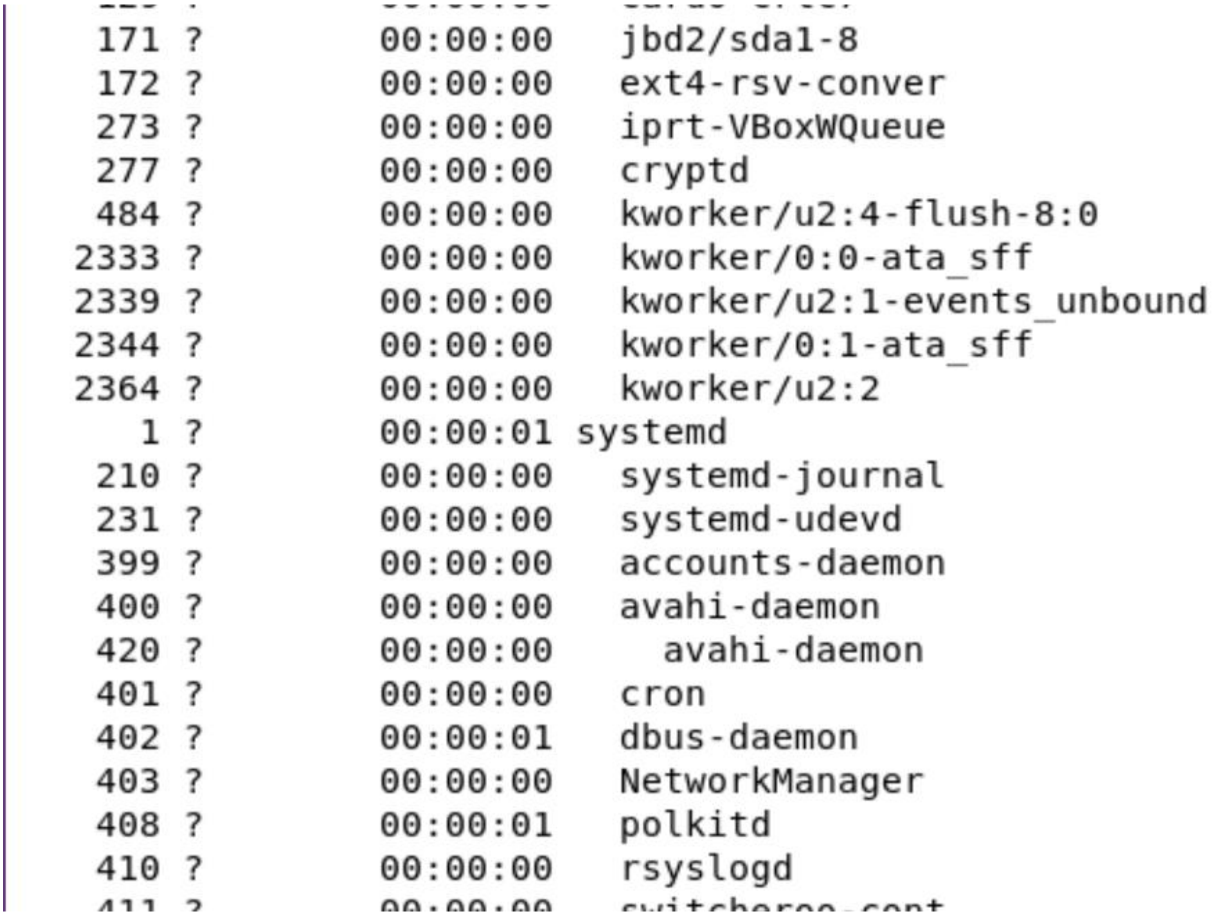
```
felix@debian:~$ w
 14:27:31 up 3 min,  1 user,  load average: 0,97, 0,83, 0,38
USER     TTY      VON              LOGIN@   IDLE   JCPU   PCPU WHAT
felix    tty2     tty2             14:24    3:47   0.01 s  0.01 s /usr/libexec/gn
felix@debian:~$ ps -aux
USER         PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root           1  0.6  0.2  98496 10348 ?        Ss   14:23   0:01 /sbin/init
root           2  0.0  0.0      0     0 ?        S    14:23   0:00 [kthreadd]
root           3  0.0  0.0      0     0 ?        I<   14:23   0:00 [rcu_gp]
root           4  0.0  0.0      0     0 ?        I<   14:23   0:00 [rcu_par_gp]
root           5  0.0  0.0      0     0 ?        I    14:23   0:00 [kworker/0:0-
root           6  0.0  0.0      0     0 ?        I<   14:23   0:00 [kworker/0:0H
root           7  0.0  0.0      0     0 ?        I    14:23   0:00 [kworker/0:1-
root           8  0.0  0.0      0     0 ?        I    14:23   0:00 [kworker/u2:0
root           9  0.0  0.0      0     0 ?        I<   14:23   0:00 [mm_percpu_wq
root          10  0.0  0.0      0     0 ?        S    14:23   0:00 [rcu_tasks_ru
root          11  0.0  0.0      0     0 ?        S    14:23   0:00 [rcu_tasks_tr
root          12  0.0  0.0      0     0 ?        S    14:23   0:00 [ksoftirqd/0]
root          13  0.0  0.0      0     0 ?        I    14:23   0:00 [rcu_sched]
root          14  0.0  0.0      0     0 ?        S    14:23   0:00 [migration/0]
root          15  0.0  0.0      0     0 ?        S    14:23   0:00 [cpuhp/0]
root          17  0.0  0.0      0     0 ?        S    14:23   0:00 [kdevtmpfs]
root          18  0.0  0.0      0     0 ?        I<   14:23   0:00 [netns]
root          19  0.0  0.0      0     0 ?        S    14:23   0:00 [kauditd]
root          20  0.0  0.0      0     0 ?        S    14:23   0:00 [khungtaskd]
root          21  0.0  0.0      0     0 ?        S    14:23   0:00 [oom_reaper]
root          22  0.0  0.0      0     0 ?        I<   14:23   0:00 [writeback]
root          23  0.0  0.0      0     0 ?        S    14:23   0:00 [kcompactd0]
root          24  0.0  0.0      0     0 ?        SN   14:23   0:00 [ksmd]
root          25  0.0  0.0      0     0 ?        SN   14:23   0:00 [khugepaged]
root          43  0.0  0.0      0     0 ?        I<   14:23   0:00 [kintegrityd]
root          44  0.0  0.0      0     0 ?        I<   14:23   0:00 [kblockd]
root          45  0.0  0.0      0     0 ?        I<   14:23   0:00 [blkcg_punt_b
root          46  0.0  0.0      0     0 ?        I<   14:23   0:00 [edac-poller]
root          47  0.0  0.0      0     0 ?        I<   14:23   0:00 [devfreq_wq]
root          48  0.0  0.0      0     0 ?        I<   14:23   0:00 [kworker/0:1H
root          49  0.0  0.0      0     0 ?        S    14:23   0:00 [kswapd0]
root          50  0.0  0.0      0     0 ?        I<   14:23   0:00 [kthrotld]
root          51  0.0  0.0      0     0 ?        I<   14:23   0:00 [acpi_thermal
root          52  0.0  0.0      0     0 ?        I<   14:23   0:00 [ipv6_addrcon
```

.... 15

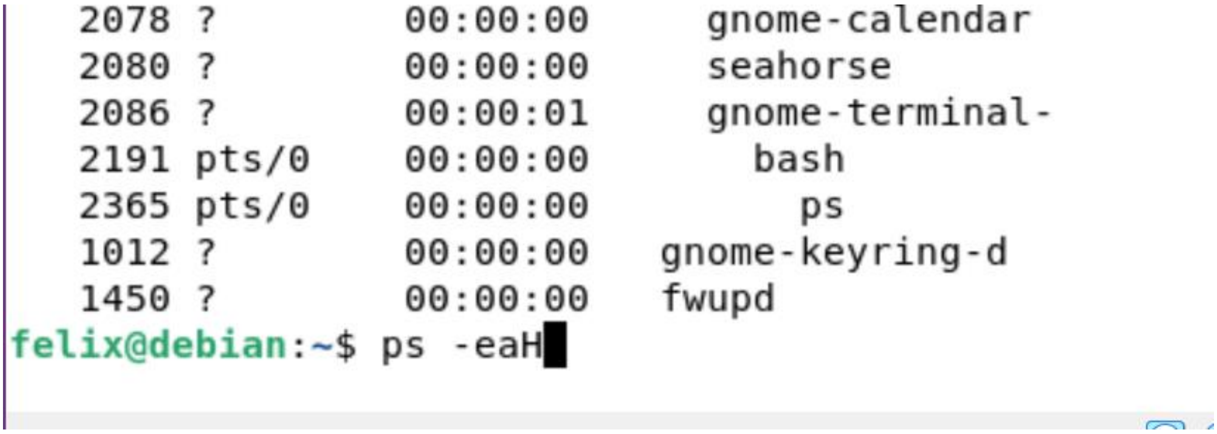


```
top - 14:28:14 up 4 min,  1 user,  load average: 0,65, 0,76, 0,37
Tasks: 170 total,   1 running, 169 sleeping,   0 stopped,   0 zombie
%CPU(s): 11,5 us,  5,1 sy,  0,0 ni, 83,4 id,  0,0 wa,  0,0 hi,  0,0 si,  0,0 st
MiB Spch:   3931,6 total,   2236,0 free,    648,7 used,   1046,9 buff/cache
MiB Swap:    170,0 total,    170,0 free,      0,0 used.   3044,5 avail Spch

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     ZEIT+ BEFEHL
   1114 felix     20   0 3438372 302020 118624 S  10,6   7,5   0:16.53 gnome-shell
   2086 felix     20   0  402848  47344  37876 S   5,3   1,2   0:01.45 gnome-termi+
   2215 felix     20   0   10380   4100   3336 R   1,0   0,1   0:00.14 top
   1389 felix     20   0  152640   2520   2144 S   0,7   0,1   0:01.00 VBoxClient
    119 root      20   0       0      0      0 I   0,3   0,0   0:00.26 kworker/0:3+
      1 root      20   0   98496  10348   7796 S   0,0   0,3   0:01.57 systemd
      2 root      20   0       0      0      0 S   0,0   0,0   0:00.00 kthreadd
      3 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 rcu_gp
      4 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 rcu_par_gp
      5 root      20   0       0      0      0 I   0,0   0,0   0:00.07 kworker/0:0+
      6 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 kworker/0:0+
      7 root      20   0       0      0      0 I   0,0   0,0   0:00.04 kworker/0:1+
      8 root      20   0       0      0      0 I   0,0   0,0   0:00.02 kworker/u2:+
      9 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 mm_percpu_wq
     10 root      20   0       0      0      0 S   0,0   0,0   0:00.00 rcu_tasks_r+
     11 root      20   0       0      0      0 S   0,0   0,0   0:00.00 rcu_tasks_t+
     12 root      20   0       0      0      0 S   0,0   0,0   0:00.06 ksoftirqd/0
     13 root      20   0       0      0      0 I   0,0   0,0   0:00.13 rcu_sched
     14 root      rt   0       0      0      0 S   0,0   0,0   0:00.00 migration/0
     15 root      20   0       0      0      0 S   0,0   0,0   0:00.00 cpuhp/0
     17 root      20   0       0      0      0 S   0,0   0,0   0:00.00 kdevtmpfs
     18 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 netns
     19 root      20   0       0      0      0 S   0,0   0,0   0:00.00 kauditd
     20 root      20   0       0      0      0 S   0,0   0,0   0:00.00 khungtaskd
     21 root      20   0       0      0      0 S   0,0   0,0   0:00.00 oom_reaper
     22 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 writeback
     23 root      20   0       0      0      0 S   0,0   0,0   0:00.01 kcompactd0
     24 root      25   5       0      0      0 S   0,0   0,0   0:00.00 ksmd
     25 root      39  19       0      0      0 S   0,0   0,0   0:00.25 khugepaged
     43 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 kintegrityd
     44 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 kblockd
     45 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 blkcg_punt_+
     46 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 edac-poller
     47 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 devfreq_wq
     48 root       0 -20       0      0      0 I   0,0   0,0   0:00.12 kworker/0:1+
     49 root      20   0       0      0      0 S   0,0   0,0   0:00.00 kswapd0
     50 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 kthrotld
     51 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 acpi_therma+
     52 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 ipv6_addrco+
```



```
    171 ?        00:00:00   jbd2/sda1-8
    172 ?        00:00:00   ext4-rsv-conver
    273 ?        00:00:00   iprt-VBoxWQueue
    277 ?        00:00:00   cryptd
    484 ?        00:00:00   kworker/u2:4-flush-8:0
   2333 ?        00:00:00   kworker/0:0-ata_sff
   2339 ?        00:00:00   kworker/u2:1-events_unbound
   2344 ?        00:00:00   kworker/0:1-ata_sff
   2364 ?        00:00:00   kworker/u2:2
      1 ?        00:00:01 systemd
    210 ?        00:00:00   systemd-journal
    231 ?        00:00:00   systemd-udevd
    399 ?        00:00:00   accounts-daemon
    400 ?        00:00:00   avahi-daemon
    420 ?        00:00:00     avahi-daemon
    401 ?        00:00:00   cron
    402 ?        00:00:01   dbus-daemon
    403 ?        00:00:00   NetworkManager
    408 ?        00:00:01   polkitd
    410 ?        00:00:00   rsyslogd
    411 ?        00:00:00   switcheroo-cont
```



```
   2078 ?        00:00:00       gnome-calendar
   2080 ?        00:00:00       seahorse
   2086 ?        00:00:01       gnome-terminal-
   2191 pts/0    00:00:00         bash
   2365 pts/0    00:00:00           ps
   1012 ?        00:00:00     gnome-keyring-d
   1450 ?        00:00:00     fwupd
felix@debian:~$ ps -eaH
```

1 Aufgabenstellung

1.1 Knottenbelt Lecture IV

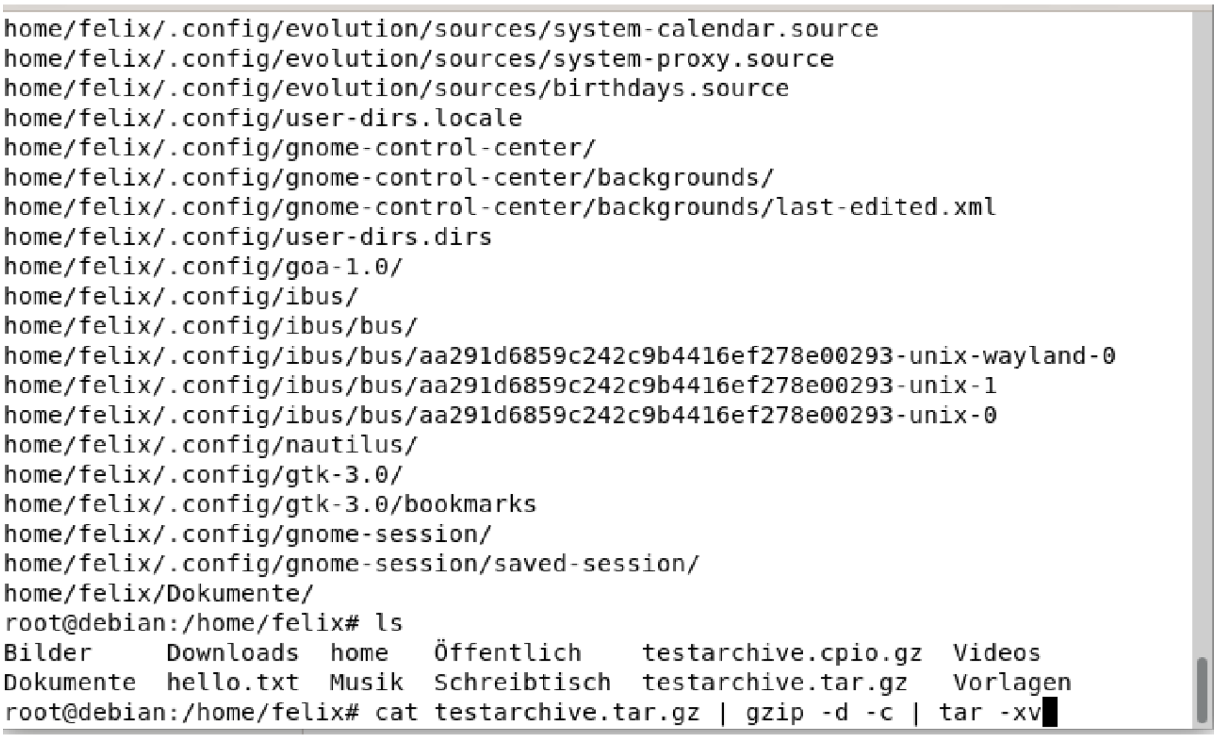
2 Theoretische Grundlagen

2.1 Knottenbelt Lecture IV

3 Übungsdurchführung

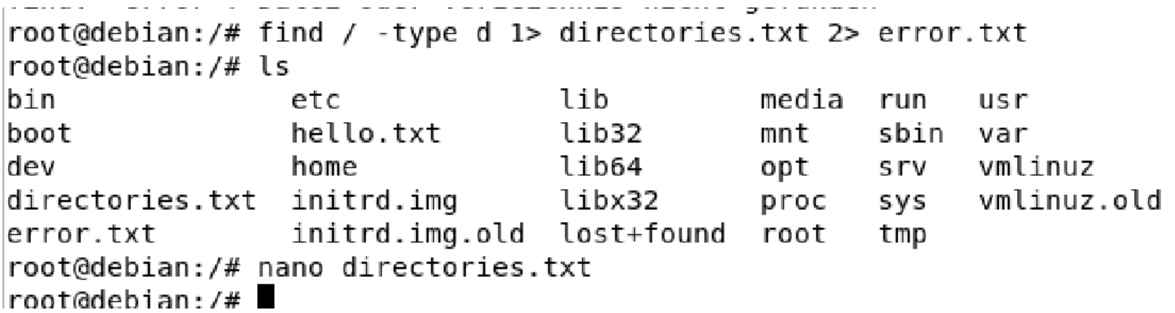
3.1 Knottenbelt Lecture IV

3.1.1 Archive the contents of your home directory using tar. Compress the tar file with gzip. Now uncompress and unarchive the .tar.gz file using cat, tar and gzip on one command line.



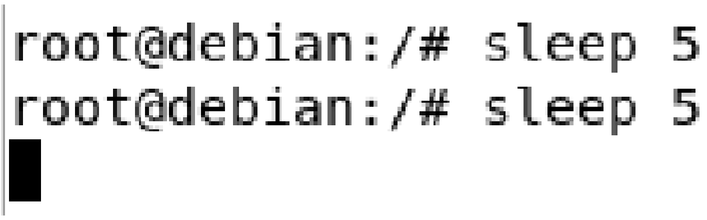
```
home/felix/.config/evolution/sources/system-calendar.source
home/felix/.config/evolution/sources/system-proxy.source
home/felix/.config/evolution/sources/birthdays.source
home/felix/.config/user-dirs.locale
home/felix/.config/gnome-control-center/
home/felix/.config/gnome-control-center/backgrounds/
home/felix/.config/gnome-control-center/backgrounds/last-edited.xml
home/felix/.config/user-dirs.dirs
home/felix/.config/goa-1.0/
home/felix/.config/ibus/
home/felix/.config/ibus/bus/
home/felix/.config/ibus/bus/aa291d6859c242c9b4416ef278e00293-unix-wayland-0
home/felix/.config/ibus/bus/aa291d6859c242c9b4416ef278e00293-unix-1
home/felix/.config/ibus/bus/aa291d6859c242c9b4416ef278e00293-unix-0
home/felix/.config/nautilus/
home/felix/.config/gtk-3.0/
home/felix/.config/gtk-3.0/bookmarks
home/felix/.config/gnome-session/
home/felix/.config/gnome-session/saved-session/
home/felix/Dokumente/
root@debian:/home/felix# ls
Bilder     Downloads  home   Öffentlich    testarchive.cpio.gz  Videos
Dokumente  hello.txt  Musik  Schreibtisch  testarchive.tar.gz   Vorlagen
root@debian:/home/felix# cat testarchive.tar.gz | gzip -d -c | tar -xv
```

3.1.2 Use find to compile a list of all directories in the system, redirecting the output so that the list of directories ends up in a file called directories.txt and the list of error messages ends up in a file called errors.txt.



```
root@debian:/# find / -type d 1> directories.txt 2> error.txt
root@debian:/# ls
bin              etc             lib          media  run   usr
boot             hello.txt       lib32        mnt    sbin  var
dev              home            lib64        opt    srv   vmlinuz
directories.txt  initrd.img      libx32       proc   sys   vmlinuz.old
error.txt        initrd.img.old  lost+found   root   tmp
root@debian:/# nano directories.txt
root@debian:/# 
```

3.1.3 Try the command sleep 5. What does this command do?

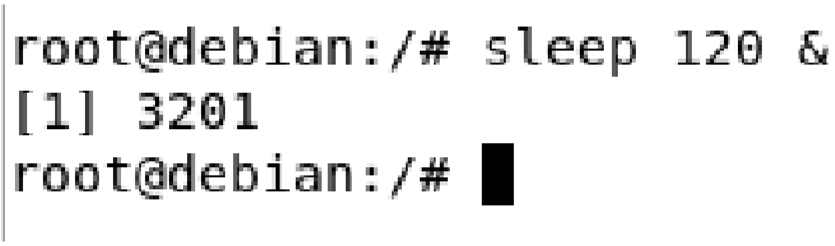


```
root@debian:/# sleep 5
root@debian:/# sleep 5

```

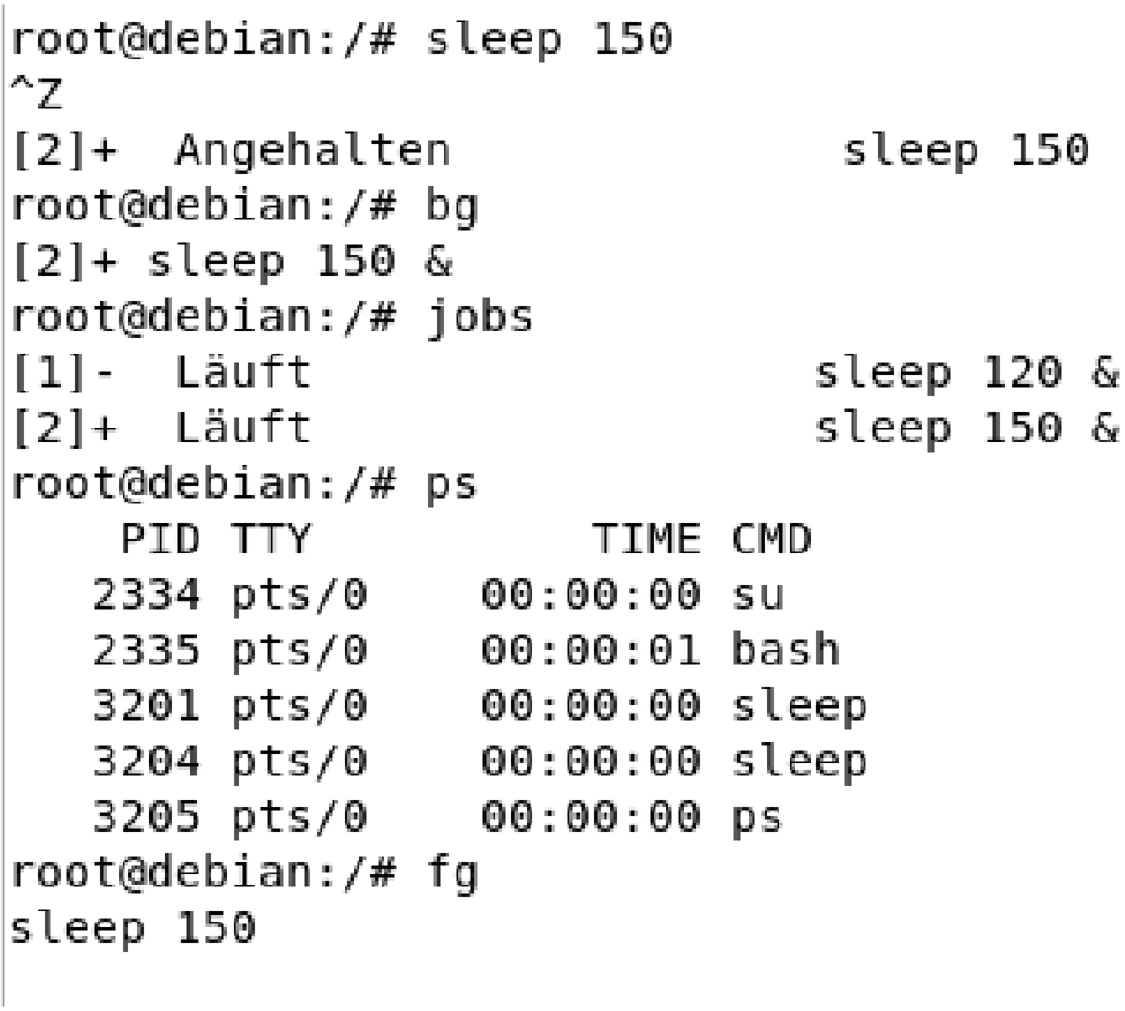
Der Befehl lässt das Terminal für 5 Sekunden schlafen.

3.1.4 Run the command in the background using &.



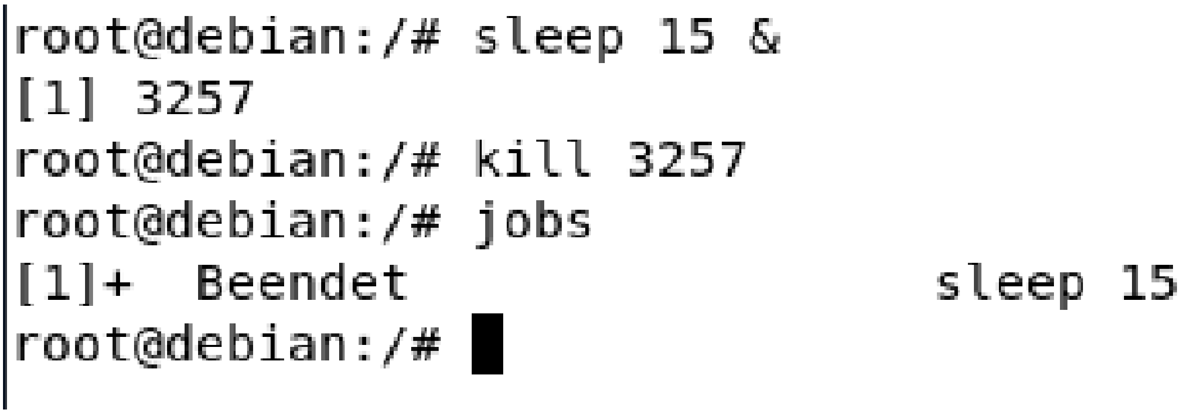
```
root@debian:/# sleep 120 &
[1] 3201
root@debian:/# █
```

3.1.5 Run sleep 15 in the foreground, suspend it with Ctrl-z and then put it into the background with bg. Type jobs. Type ps. Bring the job back into the foreground with fg.



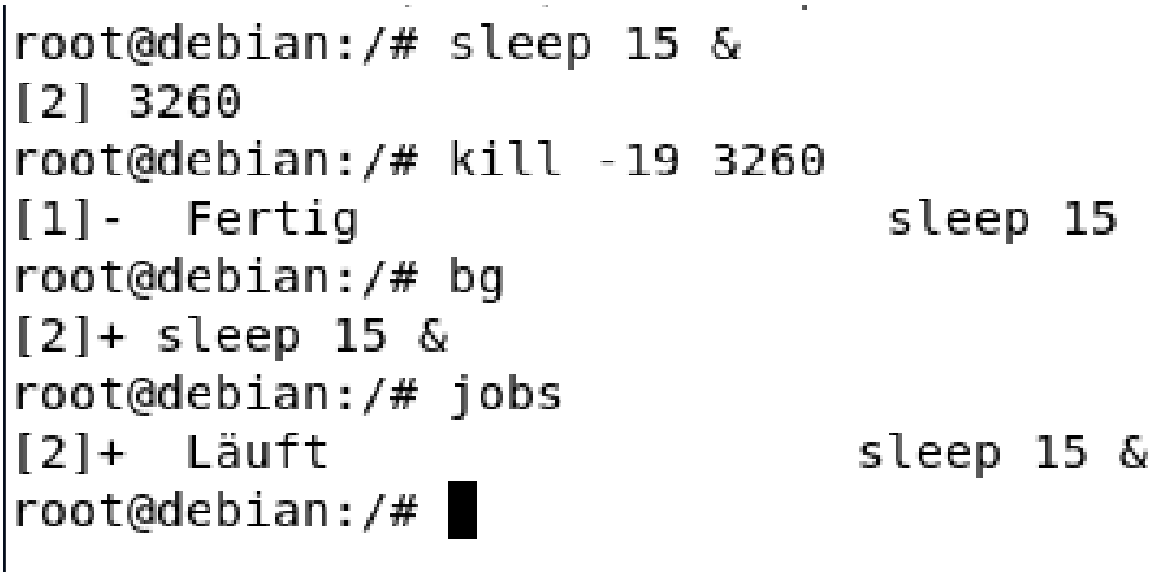
```
root@debian:/# sleep 150
^Z
[2]+  Angehalten              sleep 150
root@debian:/# bg
[2]+ sleep 150 &
root@debian:/# jobs
[1]-  Läuft                  sleep 120 &
[2]+  Läuft                  sleep 150 &
root@debian:/# ps
   PID TTY          TIME CMD
  2334 pts/0    00:00:00 su
  2335 pts/0    00:00:01 bash
  3201 pts/0    00:00:00 sleep
  3204 pts/0    00:00:00 sleep
  3205 pts/0    00:00:00 ps
root@debian:/# fg
sleep 150
```

3.1.6 Run sleep 15 in the background using &, and then use kill to terminate the process by its job number. Repeat, except this time kill the process by specifying its PID.



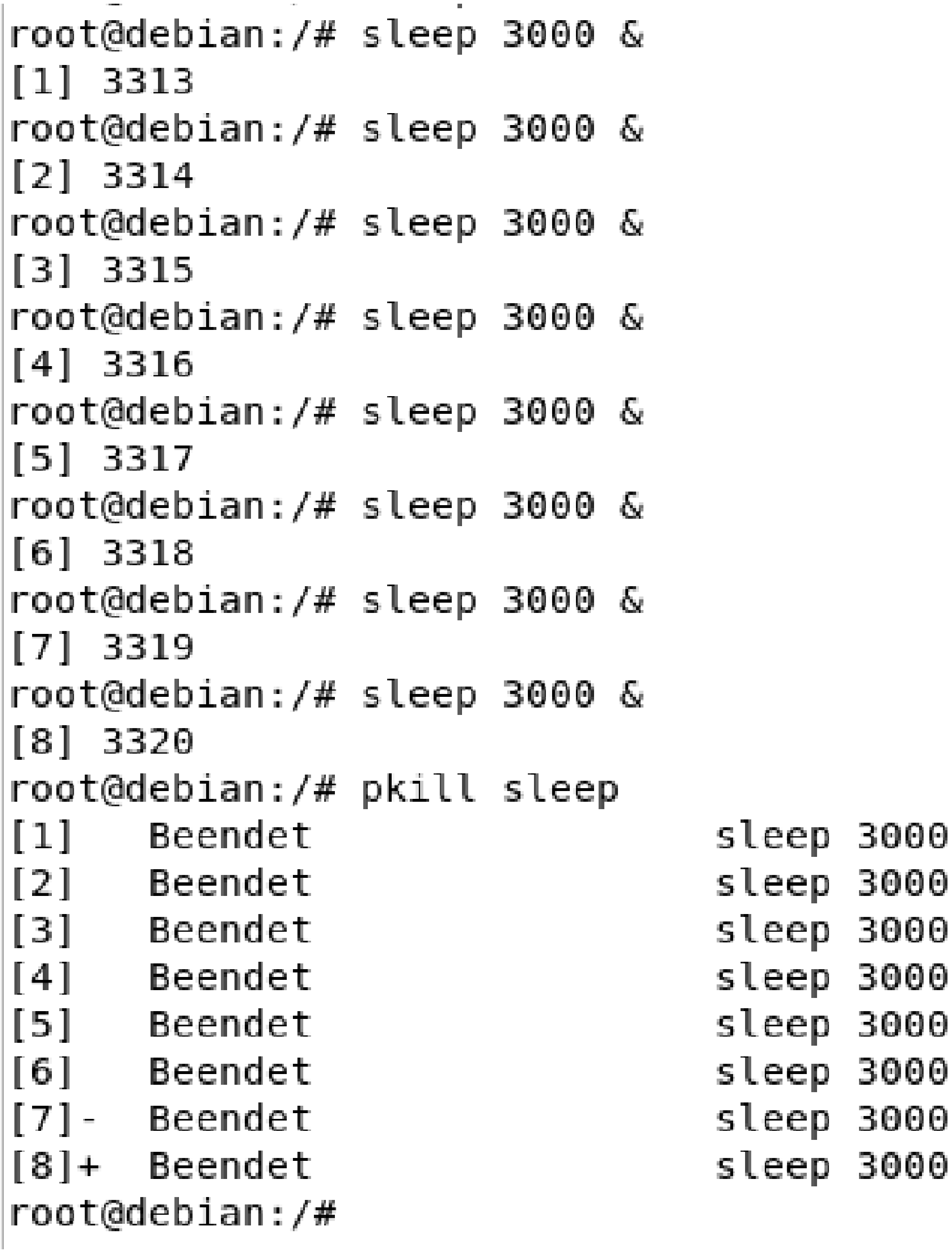
```
root@debian:/# sleep 15 &
[1] 3257
root@debian:/# kill 3257
root@debian:/# jobs
[1]+  Beendet                    sleep 15
root@debian:/# 
```

3.1.7 Run sleep 15 in the background using &, and then use kill to suspend the process. Use bg to continue running the process.



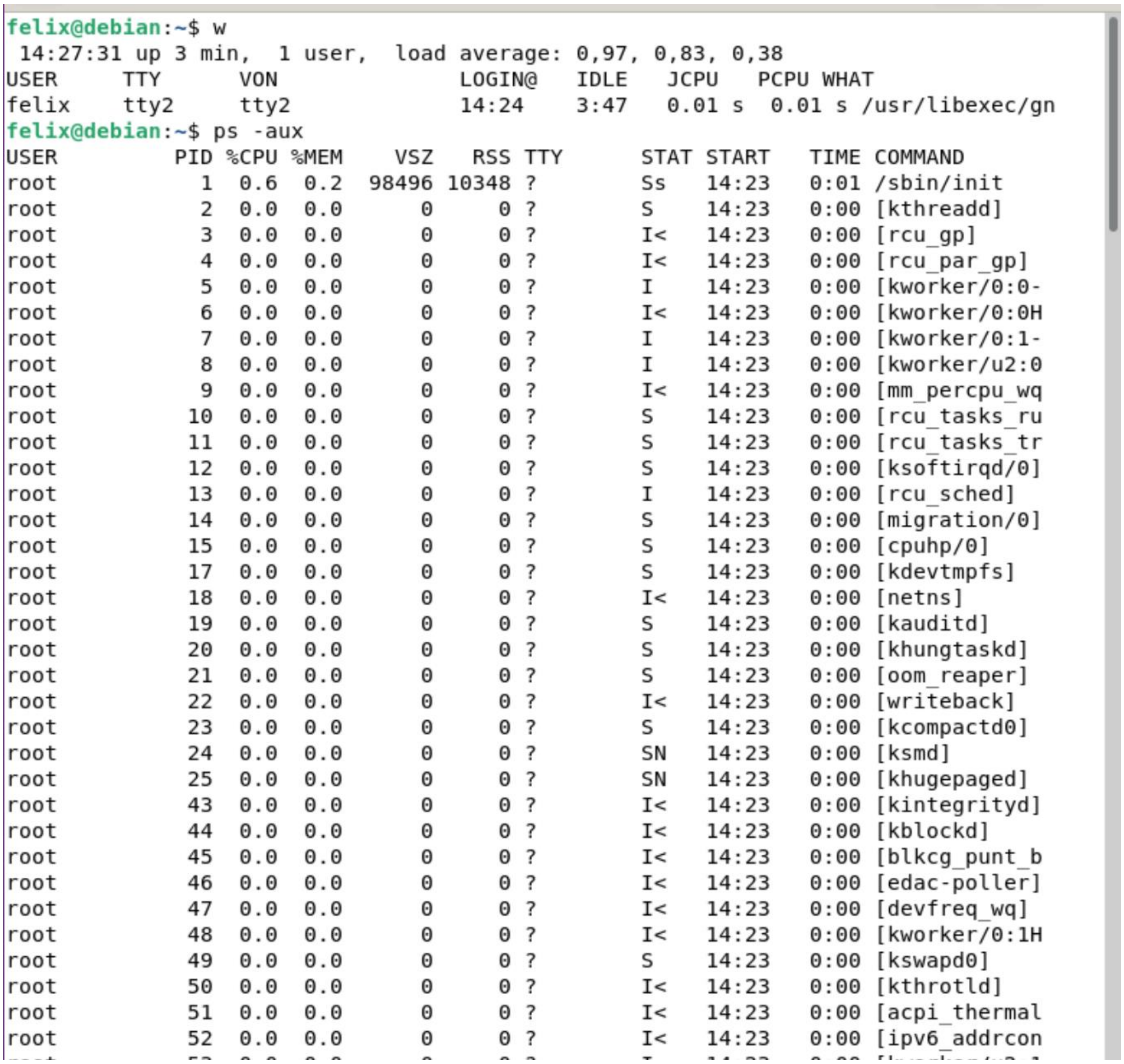
```
root@debian:/# sleep 15 &
[2] 3260
root@debian:/# kill -19 3260
[1]-  Fertig                     sleep 15
root@debian:/# bg
[2]+ sleep 15 &
root@debian:/# jobs
[2]+  Läuft                      sleep 15 &
root@debian:/# 
```

3.1.8 Startup a number of sleep 60 processes in the background, and terminate them all at the same time using the pkill command.

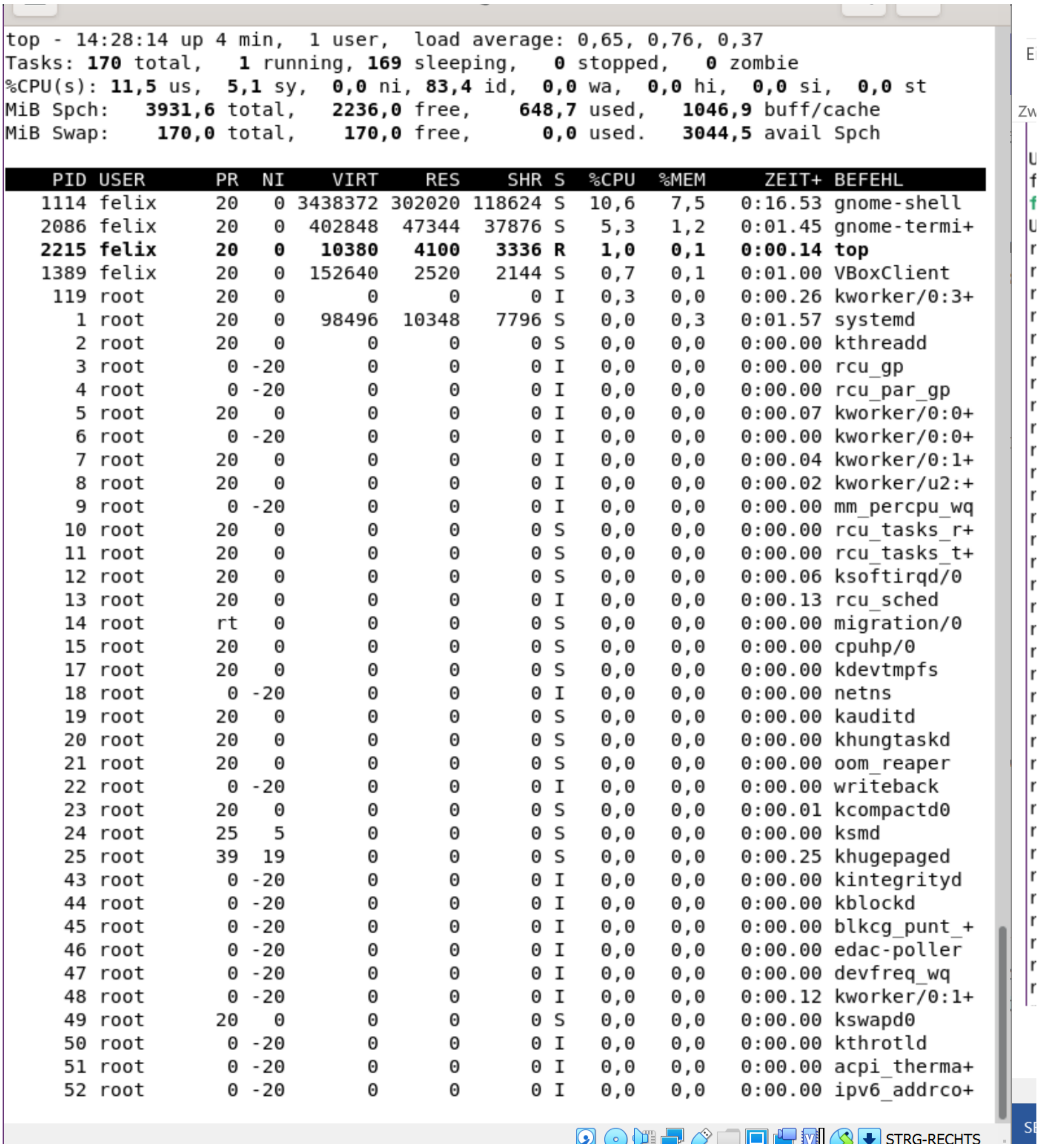


```
root@debian:/# sleep 3000 &
[1] 3313
root@debian:/# sleep 3000 &
[2] 3314
root@debian:/# sleep 3000 &
[3] 3315
root@debian:/# sleep 3000 &
[4] 3316
root@debian:/# sleep 3000 &
[5] 3317
root@debian:/# sleep 3000 &
[6] 3318
root@debian:/# sleep 3000 &
[7] 3319
root@debian:/# sleep 3000 &
[8] 3320
root@debian:/# pkill sleep
[1]   Beendet                 sleep 3000
[2]   Beendet                 sleep 3000
[3]   Beendet                 sleep 3000
[4]   Beendet                 sleep 3000
[5]   Beendet                 sleep 3000
[6]   Beendet                 sleep 3000
[7]-  Beendet                 sleep 3000
[8]+  Beendet                 sleep 3000
root@debian:/#
```

3.1.9 Use ps, w and top to show all processes that are executing.



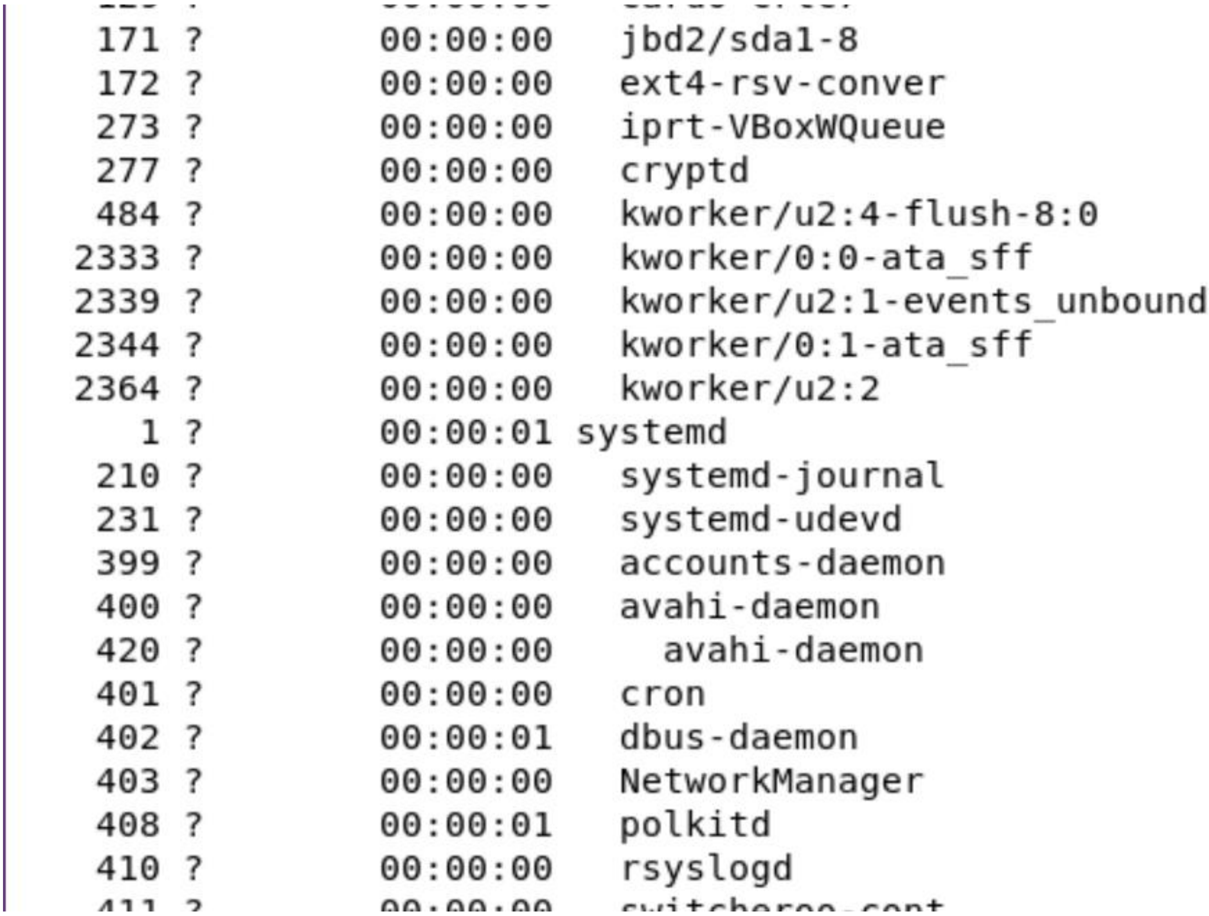
```
felix@debian:~$ w
 14:27:31 up 3 min,  1 user,  load average: 0,97, 0,83, 0,38
USER     TTY      VON              LOGIN@   IDLE   JCPU   PCPU WHAT
felix    tty2     tty2             14:24    3:47   0.01 s  0.01 s /usr/libexec/gn
felix@debian:~$ ps -aux
USER         PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root           1  0.6  0.2  98496 10348 ?        Ss   14:23   0:01 /sbin/init
root           2  0.0  0.0      0     0 ?        S    14:23   0:00 [kthreadd]
root           3  0.0  0.0      0     0 ?        I<   14:23   0:00 [rcu_gp]
root           4  0.0  0.0      0     0 ?        I<   14:23   0:00 [rcu_par_gp]
root           5  0.0  0.0      0     0 ?        I    14:23   0:00 [kworker/0:0-
root           6  0.0  0.0      0     0 ?        I<   14:23   0:00 [kworker/0:0H
root           7  0.0  0.0      0     0 ?        I    14:23   0:00 [kworker/0:1-
root           8  0.0  0.0      0     0 ?        I    14:23   0:00 [kworker/u2:0
root           9  0.0  0.0      0     0 ?        I<   14:23   0:00 [mm_percpu_wq
root          10  0.0  0.0      0     0 ?        S    14:23   0:00 [rcu_tasks_ru
root          11  0.0  0.0      0     0 ?        S    14:23   0:00 [rcu_tasks_tr
root          12  0.0  0.0      0     0 ?        S    14:23   0:00 [ksoftirqd/0]
root          13  0.0  0.0      0     0 ?        I    14:23   0:00 [rcu_sched]
root          14  0.0  0.0      0     0 ?        S    14:23   0:00 [migration/0]
root          15  0.0  0.0      0     0 ?        S    14:23   0:00 [cpuhp/0]
root          17  0.0  0.0      0     0 ?        S    14:23   0:00 [kdevtmpfs]
root          18  0.0  0.0      0     0 ?        I<   14:23   0:00 [netns]
root          19  0.0  0.0      0     0 ?        S    14:23   0:00 [kauditd]
root          20  0.0  0.0      0     0 ?        S    14:23   0:00 [khungtaskd]
root          21  0.0  0.0      0     0 ?        S    14:23   0:00 [oom_reaper]
root          22  0.0  0.0      0     0 ?        I<   14:23   0:00 [writeback]
root          23  0.0  0.0      0     0 ?        S    14:23   0:00 [kcompactd0]
root          24  0.0  0.0      0     0 ?        SN   14:23   0:00 [ksmd]
root          25  0.0  0.0      0     0 ?        SN   14:23   0:00 [khugepaged]
root          43  0.0  0.0      0     0 ?        I<   14:23   0:00 [kintegrityd]
root          44  0.0  0.0      0     0 ?        I<   14:23   0:00 [kblockd]
root          45  0.0  0.0      0     0 ?        I<   14:23   0:00 [blkcg_punt_b
root          46  0.0  0.0      0     0 ?        I<   14:23   0:00 [edac-poller]
root          47  0.0  0.0      0     0 ?        I<   14:23   0:00 [devfreq_wq]
root          48  0.0  0.0      0     0 ?        I<   14:23   0:00 [kworker/0:1H
root          49  0.0  0.0      0     0 ?        S    14:23   0:00 [kswapd0]
root          50  0.0  0.0      0     0 ?        I<   14:23   0:00 [kthrotld]
root          51  0.0  0.0      0     0 ?        I<   14:23   0:00 [acpi_thermal
root          52  0.0  0.0      0     0 ?        I<   14:23   0:00 [ipv6_addrcon
```



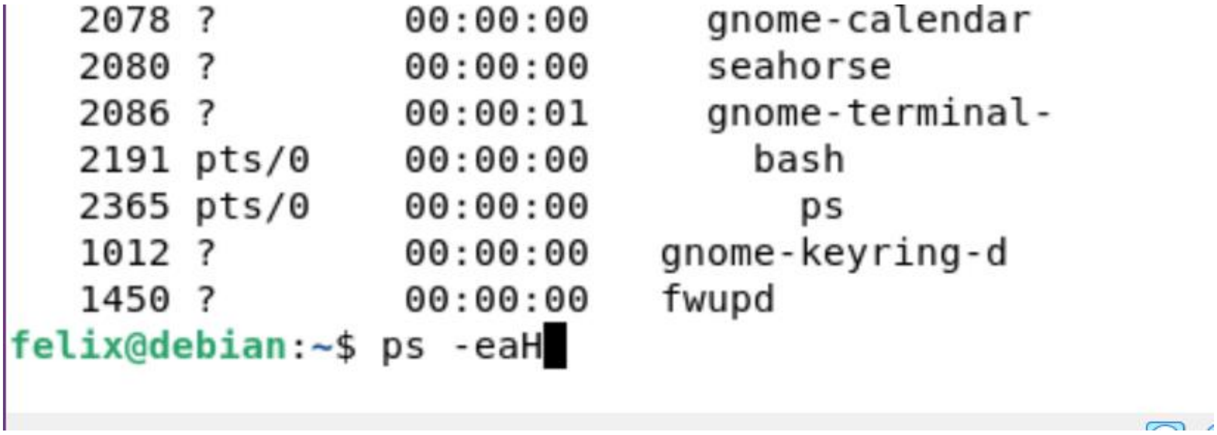
```
top - 14:28:14 up 4 min,  1 user,  load average: 0,65, 0,76, 0,37
Tasks: 170 total,   1 running, 169 sleeping,   0 stopped,   0 zombie
%CPU(s): 11,5 us,  5,1 sy,  0,0 ni, 83,4 id,  0,0 wa,  0,0 hi,  0,0 si,  0,0 st
MiB Spch:   3931,6 total,   2236,0 free,    648,7 used,   1046,9 buff/cache
MiB Swap:    170,0 total,    170,0 free,      0,0 used.   3044,5 avail Spch

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     ZEIT+ BEFEHL
   1114 felix     20   0 3438372 302020 118624 S  10,6   7,5   0:16.53 gnome-shell
   2086 felix     20   0  402848  47344  37876 S   5,3   1,2   0:01.45 gnome-termi+
   2215 felix     20   0   10380   4100   3336 R   1,0   0,1   0:00.14 top
   1389 felix     20   0  152640   2520   2144 S   0,7   0,1   0:01.00 VBoxClient
    119 root      20   0       0      0      0 I   0,3   0,0   0:00.26 kworker/0:3+
      1 root      20   0   98496  10348   7796 S   0,0   0,3   0:01.57 systemd
      2 root      20   0       0      0      0 S   0,0   0,0   0:00.00 kthreadd
      3 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 rcu_gp
      4 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 rcu_par_gp
      5 root      20   0       0      0      0 I   0,0   0,0   0:00.07 kworker/0:0+
      6 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 kworker/0:0+
      7 root      20   0       0      0      0 I   0,0   0,0   0:00.04 kworker/0:1+
      8 root      20   0       0      0      0 I   0,0   0,0   0:00.02 kworker/u2:+
      9 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 mm_percpu_wq
     10 root      20   0       0      0      0 S   0,0   0,0   0:00.00 rcu_tasks_r+
     11 root      20   0       0      0      0 S   0,0   0,0   0:00.00 rcu_tasks_t+
     12 root      20   0       0      0      0 S   0,0   0,0   0:00.06 ksoftirqd/0
     13 root      20   0       0      0      0 I   0,0   0,0   0:00.13 rcu_sched
     14 root      rt   0       0      0      0 S   0,0   0,0   0:00.00 migration/0
     15 root      20   0       0      0      0 S   0,0   0,0   0:00.00 cpuhp/0
     17 root      20   0       0      0      0 S   0,0   0,0   0:00.00 kdevtmpfs
     18 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 netns
     19 root      20   0       0      0      0 S   0,0   0,0   0:00.00 kauditd
     20 root      20   0       0      0      0 S   0,0   0,0   0:00.00 khungtaskd
     21 root      20   0       0      0      0 S   0,0   0,0   0:00.00 oom_reaper
     22 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 writeback
     23 root      20   0       0      0      0 S   0,0   0,0   0:00.01 kcompactd0
     24 root      25   5       0      0      0 S   0,0   0,0   0:00.00 ksmd
     25 root      39  19       0      0      0 S   0,0   0,0   0:00.25 khugepaged
     43 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 kintegrityd
     44 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 kblockd
     45 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 blkcg_punt_+
     46 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 edac-poller
     47 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 devfreq_wq
     48 root       0 -20       0      0      0 I   0,0   0,0   0:00.12 kworker/0:1+
     49 root      20   0       0      0      0 S   0,0   0,0   0:00.00 kswapd0
     50 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 kthrotld
     51 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 acpi_therma+
     52 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 ipv6_addrco+
```

3.1.10 Use ps -aeH to display the process hierarchy. Look for the init process. See if you can identify important system daemons. Can you also identify your shell and its subprocesses?



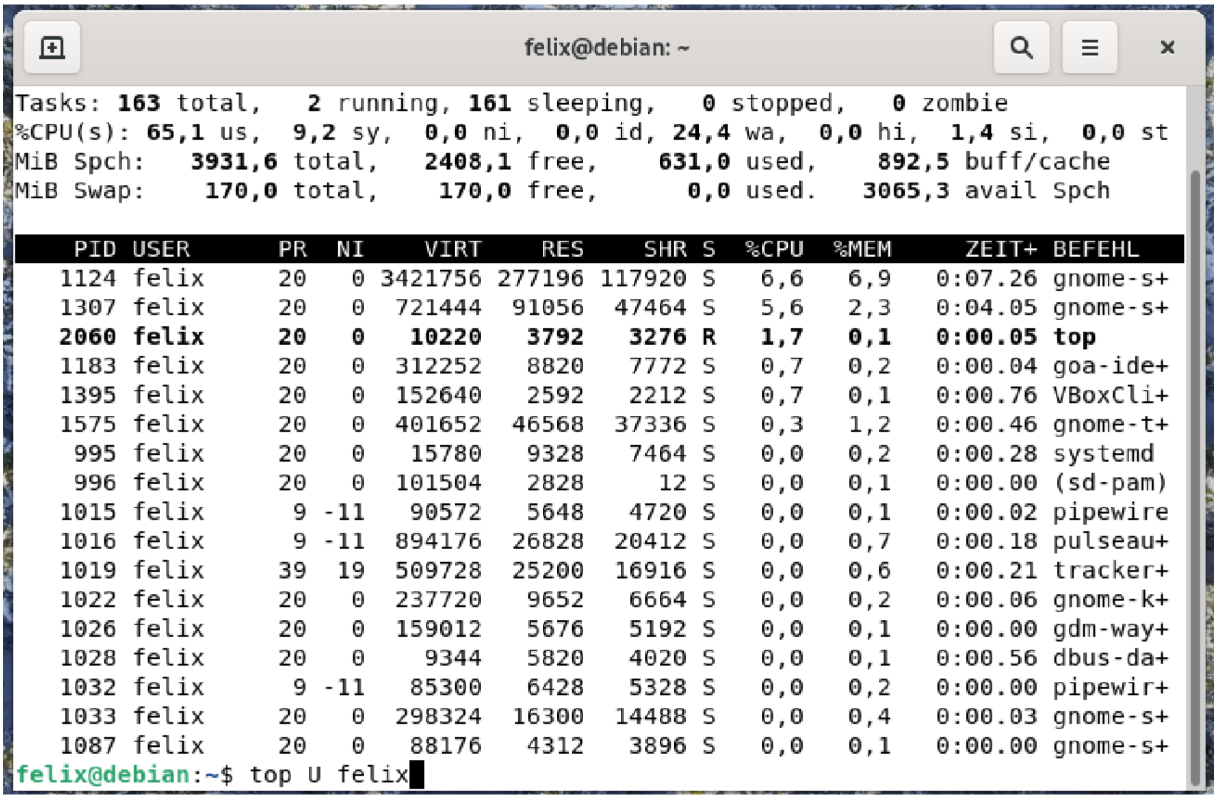
```
  171 ?        00:00:00   jbd2/sda1-8
  172 ?        00:00:00   ext4-rsv-conver
  273 ?        00:00:00   iprt-VBoxWQueue
  277 ?        00:00:00   cryptd
  484 ?        00:00:00   kworker/u2:4-flush-8:0
 2333 ?        00:00:00   kworker/0:0-ata_sff
 2339 ?        00:00:00   kworker/u2:1-events_unbound
 2344 ?        00:00:00   kworker/0:1-ata_sff
 2364 ?        00:00:00   kworker/u2:2
    1 ?        00:00:01 systemd
  210 ?        00:00:00   systemd-journal
  231 ?        00:00:00   systemd-udevd
  399 ?        00:00:00   accounts-daemon
  400 ?        00:00:00   avahi-daemon
  420 ?        00:00:00     avahi-daemon
  401 ?        00:00:00   cron
  402 ?        00:00:01   dbus-daemon
  403 ?        00:00:00   NetworkManager
  408 ?        00:00:01   polkitd
  410 ?        00:00:00   rsyslogd
  411 ?        00:00:00   switcheroo-cont
```



```
 2078 ?        00:00:00     gnome-calendar
 2080 ?        00:00:00     seahorse
 2086 ?        00:00:01     gnome-terminal-
 2191 pts/0    00:00:00       bash
 2365 pts/0    00:00:00         ps
 1012 ?        00:00:00   gnome-keyring-d
 1450 ?        00:00:00   fwupd
felix@debian:~$ ps -eaH
```

Systemd mit der PID 1 ist der Systemdeamon und ersetzt auch den init process. Die Shell ist bash mit dem ps als subprocess.

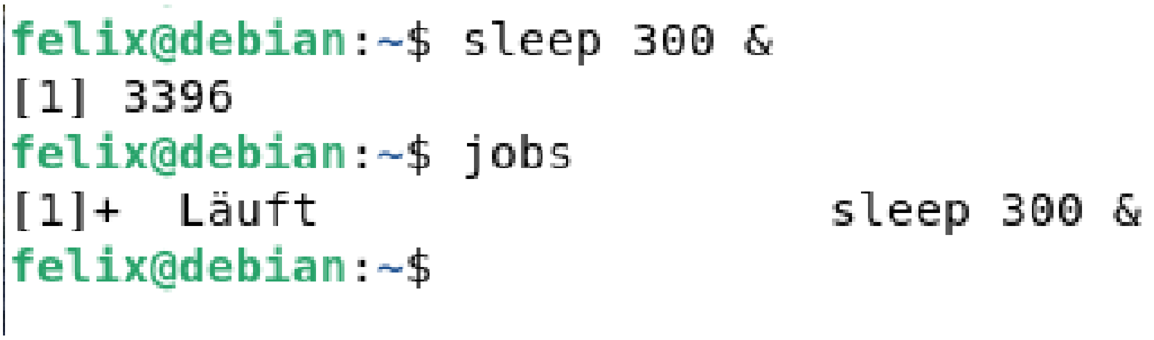
3.1.11 Combine ps -fae with grep to show all processes that you are executing, with the exception of the ps -fae and grep commands.



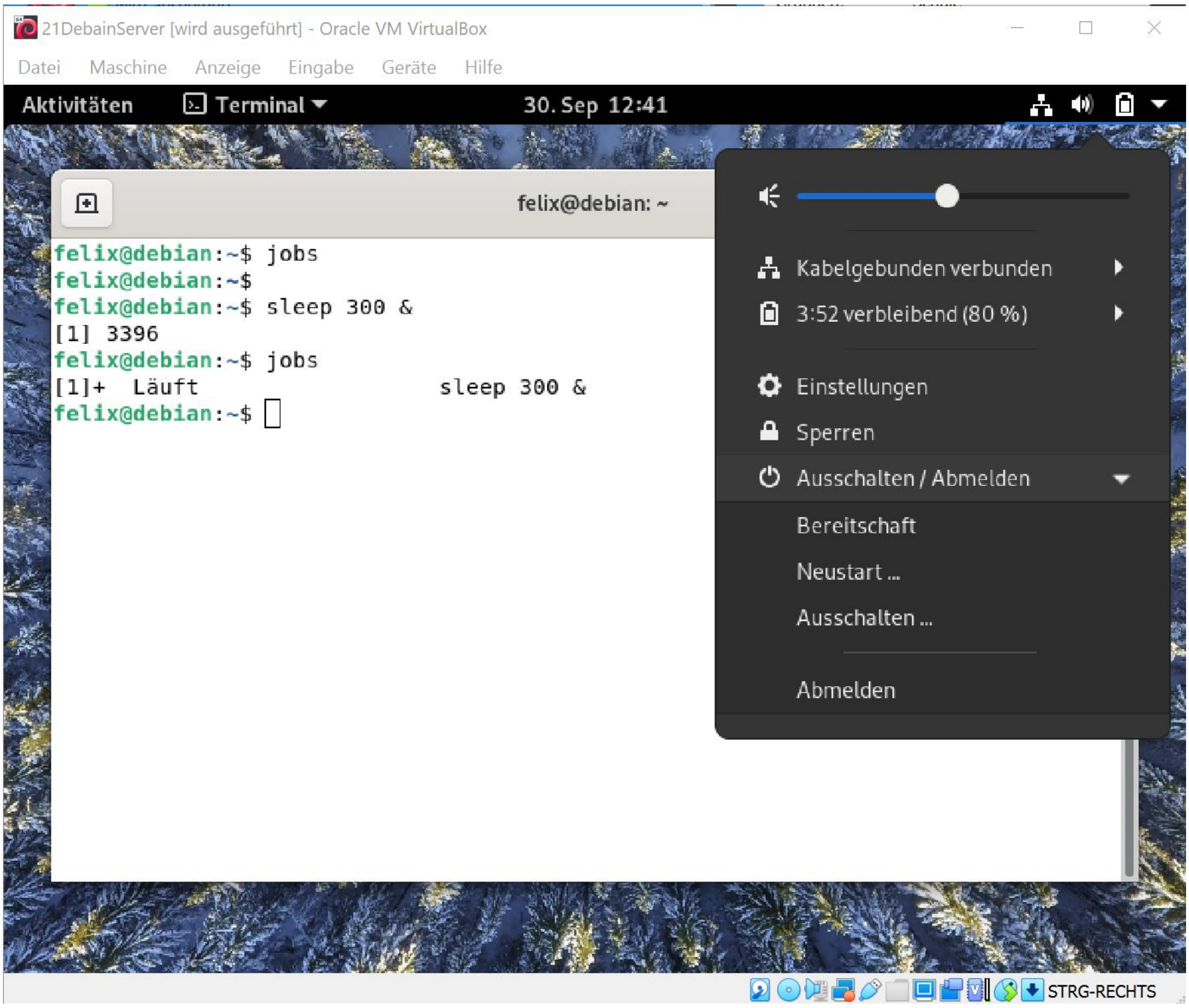
```
Tasks: 163 total,   2 running, 161 sleeping,   0 stopped,   0 zombie
%CPU(s): 65,1 us,  9,2 sy,  0,0 ni,  0,0 id, 24,4 wa,  0,0 hi,  1,4 si,  0,0 st
MiB Spch:   3931,6 total,   2408,1 free,    631,0 used,    892,5 buff/cache
MiB Swap:    170,0 total,    170,0 free,      0,0 used.   3065,3 avail Spch

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     ZEIT+ BEFEHL
   1124 felix     20   0 3421756 277196 117920 S   6,6   6,9   0:07.26 gnome-s+
   1307 felix     20   0  721444  91056  47464 S   5,6   2,3   0:04.05 gnome-s+
   2060 felix     20   0   10220   3792   3276 R   1,7   0,1   0:00.05 top
   1183 felix     20   0  312252   8820   7772 S   0,7   0,2   0:00.04 goa-ide+
   1395 felix     20   0  152640   2592   2212 S   0,7   0,1   0:00.76 VBoxCli+
   1575 felix     20   0  401652  46568  37336 S   0,3   1,2   0:00.46 gnome-t+
    995 felix     20   0   15780   9328   7464 S   0,0   0,2   0:00.28 systemd
    996 felix     20   0  101504   2828     12 S   0,0   0,1   0:00.00 (sd-pam)
   1015 felix      9 -11   90572   5648   4720 S   0,0   0,1   0:00.02 pipewire
   1016 felix      9 -11  894176  26828  20412 S   0,0   0,7   0:00.18 pulseau+
   1019 felix     39  19  509728  25200  16916 S   0,0   0,6   0:00.21 tracker+
   1022 felix     20   0  237720   9652   6664 S   0,0   0,2   0:00.06 gnome-k+
   1026 felix     20   0  159012   5676   5192 S   0,0   0,1   0:00.00 gdm-way+
   1028 felix     20   0    9344   5820   4020 S   0,0   0,1   0:00.56 dbus-da+
   1032 felix      9 -11   85300   6428   5328 S   0,0   0,2   0:00.00 pipewir+
   1033 felix     20   0  298324  16300  14488 S   0,0   0,4   0:00.03 gnome-s+
   1087 felix     20   0   88176   4312   3896 S   0,0   0,1   0:00.00 gnome-s+
felix@debian:~$ top U felix
```

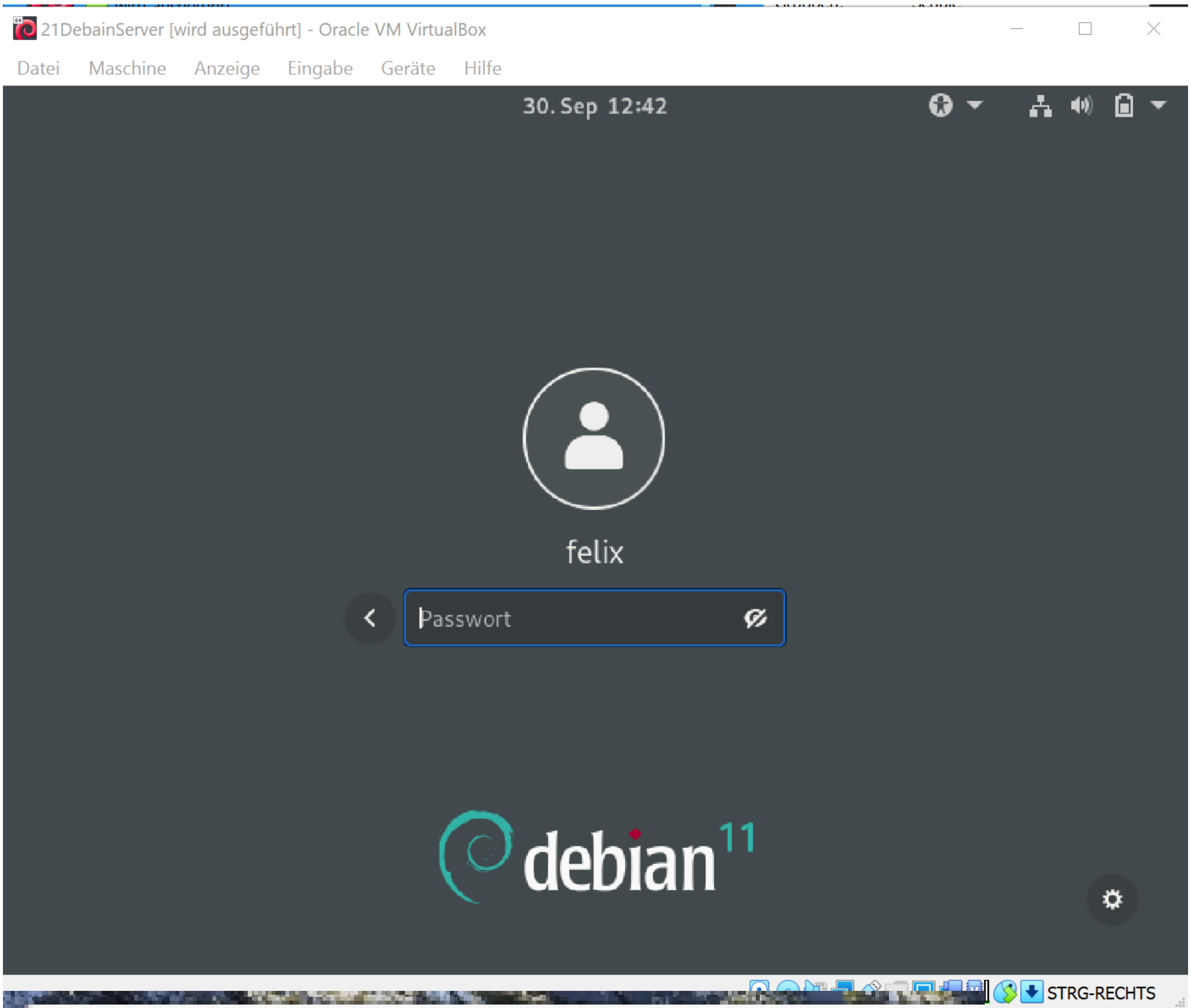
3.1.12 Start a sleep 300 process running in the background. Log off the server, and log back in again. List all the processes that you are running. What happened to your sleep process? Now repeat, except this time start by running nohup sleep 300.

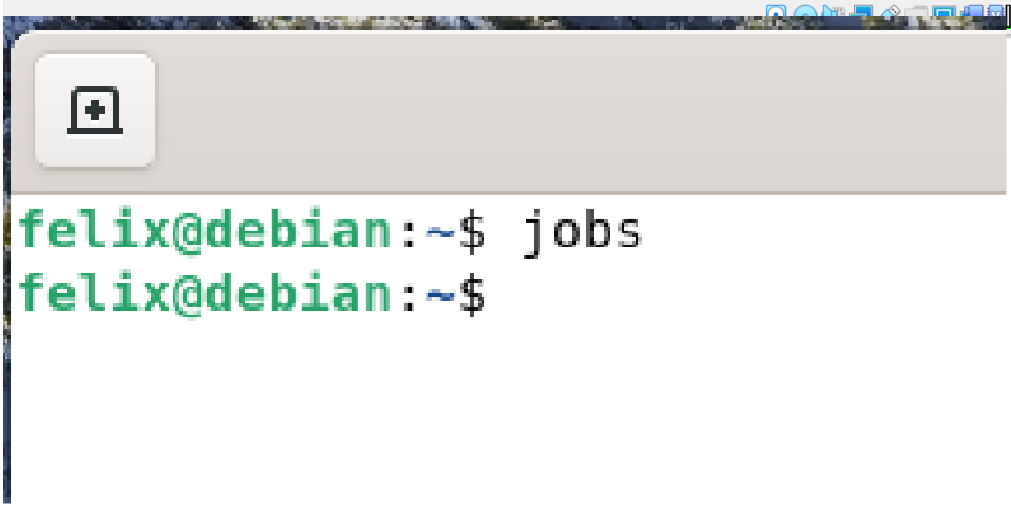


```
felix@debian:~$ sleep 300 &
[1] 3396
felix@debian:~$ jobs
[1]+  Läuft                   sleep 300 &
felix@debian:~$
```

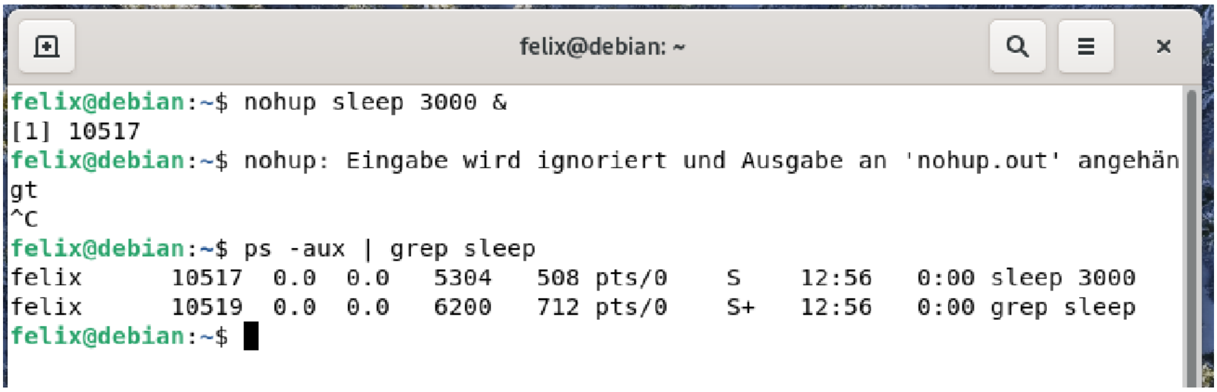


```
felix@debian:~$ jobs
felix@debian:~$
felix@debian:~$ sleep 300 &
[1] 3396
felix@debian:~$ jobs
[1]+  Läuft                   sleep 300 &
felix@debian:~$ 
```

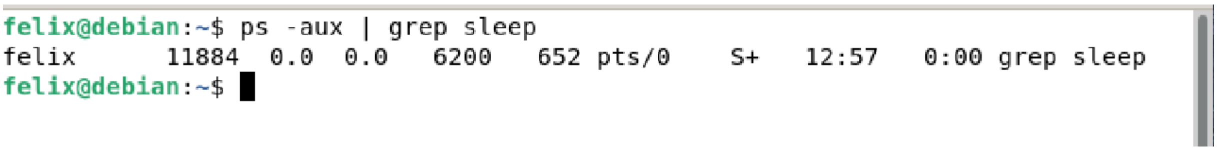




```
felix@debian:~$ jobs
felix@debian:~$
```

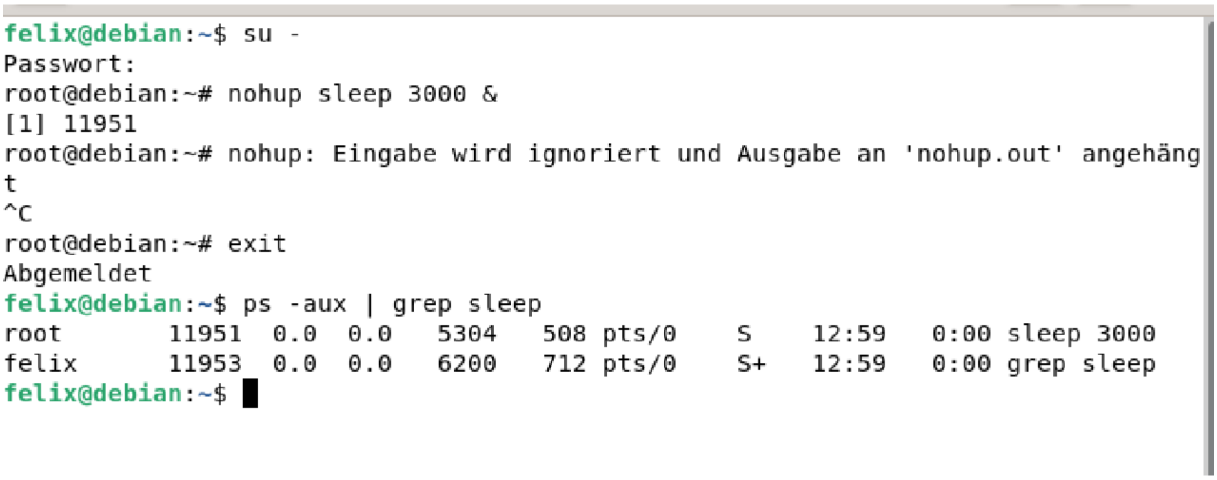


```
felix@debian:~$ nohup sleep 3000 &
[1] 10517
felix@debian:~$ nohup: Eingabe wird ignoriert und Ausgabe an 'nohup.out' angehän
gt
^C
felix@debian:~$ ps -aux | grep sleep
felix      10517  0.0  0.0   5304   508 pts/0    S    12:56   0:00 sleep 3000
felix      10519  0.0  0.0   6200   712 pts/0    S+   12:56   0:00 grep sleep
felix@debian:~$ 
```



```
felix@debian:~$ ps -aux | grep sleep
felix      11884  0.0  0.0   6200   652 pts/0    S+   12:57   0:00 grep sleep
felix@debian:~$ 
```

Eigentlich sollte hier der Prozess sleep 3000 erscheinen, doch Gnome killt den Prozess beim Abmelden.



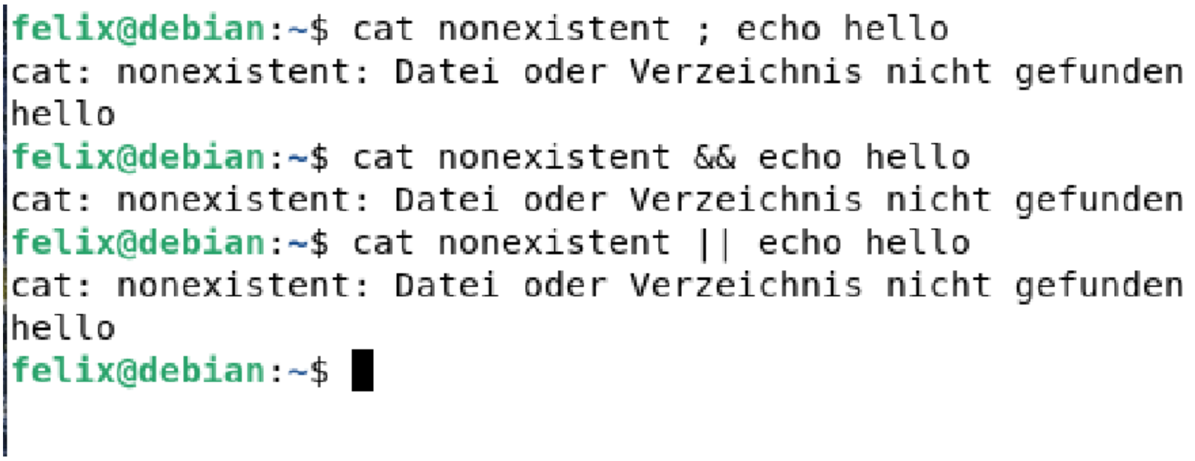
```
felix@debian:~$ su -
Passwort:
root@debian:~# nohup sleep 3000 &
[1] 11951
root@debian:~# nohup: Eingabe wird ignoriert und Ausgabe an 'nohup.out' angehäng
t
^C
root@debian:~# exit
Abgemeldet
felix@debian:~$ ps -aux | grep sleep
root       11951  0.0  0.0   5304   508 pts/0    S    12:59   0:00 sleep 3000
felix      11953  0.0  0.0   6200   712 pts/0    S+   12:59   0:00 grep sleep
felix@debian:~$ 
```

3.1.13 Multiple jobs can be issued from the same command line using the operators ;, && and ||. Try combining the commands cat nonexistent and echo hello using each of these operators. Reverse the order of the commands and try again. What are the rules about when the commands will be executed?

‘;’ … führt die Prozesse hintereinander aus

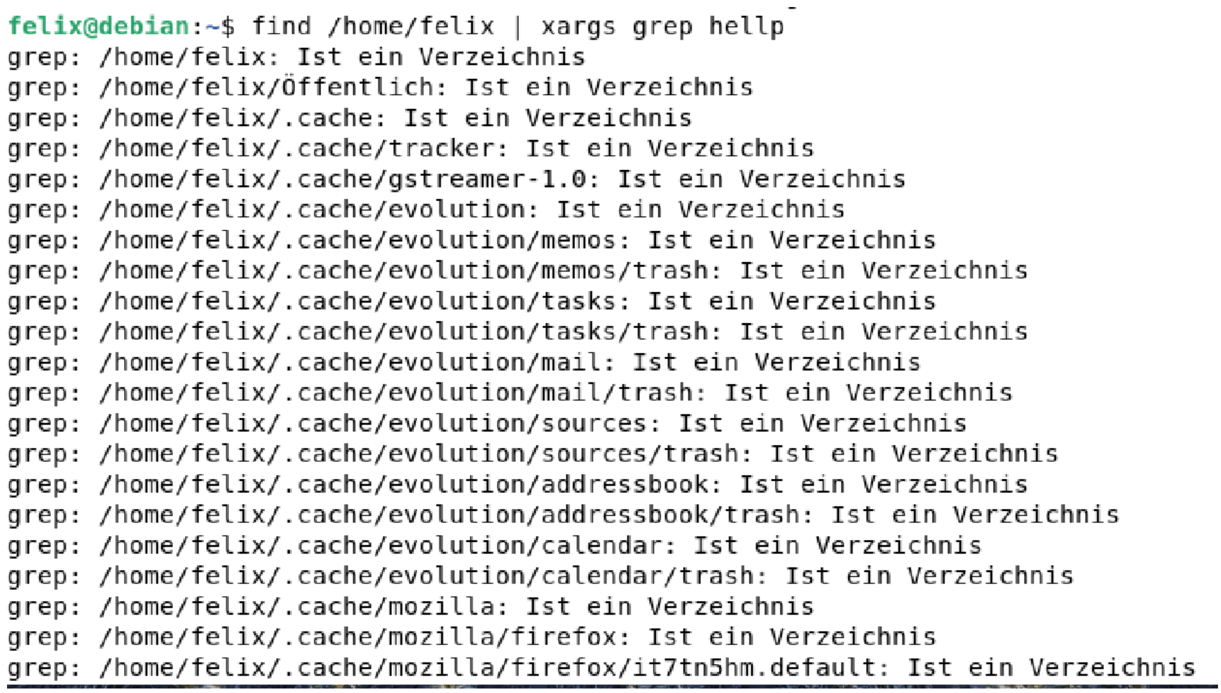
‘&&’ … führt den zweiten Prozess aus, wenn der erste erfolgreich war

‘||’ .. führt den zweiten Prozess aus, wenn der erste fehlgeschlagen hat



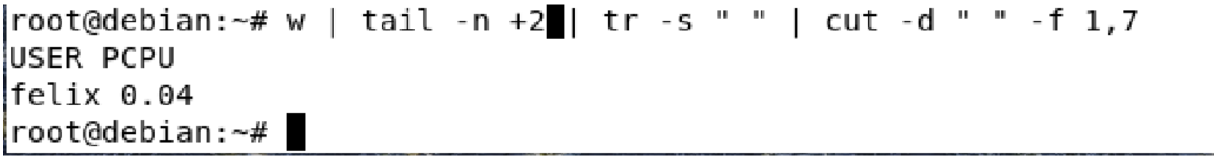
```
felix@debian:~$ cat nonexistent ; echo hello
cat: nonexistent: Datei oder Verzeichnis nicht gefunden
hello
felix@debian:~$ cat nonexistent && echo hello
cat: nonexistent: Datei oder Verzeichnis nicht gefunden
felix@debian:~$ cat nonexistent || echo hello
cat: nonexistent: Datei oder Verzeichnis nicht gefunden
hello
felix@debian:~$ 
```

3.1.14 What does the xargs command do? Can you combine it with find and grep to find yet another way of searching all files in the /home subdirectory tree for the word hello?

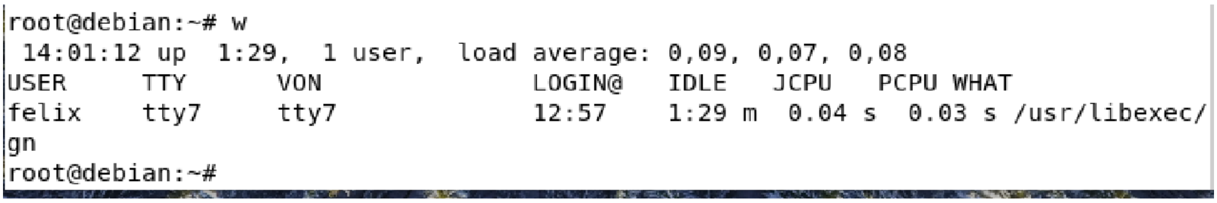


```
felix@debian:~$ find /home/felix | xargs grep hellp
grep: /home/felix: Ist ein Verzeichnis
grep: /home/felix/Öffentlich: Ist ein Verzeichnis
grep: /home/felix/.cache: Ist ein Verzeichnis
grep: /home/felix/.cache/tracker: Ist ein Verzeichnis
grep: /home/felix/.cache/gstreamer-1.0: Ist ein Verzeichnis
grep: /home/felix/.cache/evolution: Ist ein Verzeichnis
grep: /home/felix/.cache/evolution/memos: Ist ein Verzeichnis
grep: /home/felix/.cache/evolution/memos/trash: Ist ein Verzeichnis
grep: /home/felix/.cache/evolution/tasks: Ist ein Verzeichnis
grep: /home/felix/.cache/evolution/tasks/trash: Ist ein Verzeichnis
grep: /home/felix/.cache/evolution/mail: Ist ein Verzeichnis
grep: /home/felix/.cache/evolution/mail/trash: Ist ein Verzeichnis
grep: /home/felix/.cache/evolution/sources: Ist ein Verzeichnis
grep: /home/felix/.cache/evolution/sources/trash: Ist ein Verzeichnis
grep: /home/felix/.cache/evolution/addressbook: Ist ein Verzeichnis
grep: /home/felix/.cache/evolution/addressbook/trash: Ist ein Verzeichnis
grep: /home/felix/.cache/evolution/calendar: Ist ein Verzeichnis
grep: /home/felix/.cache/evolution/calendar/trash: Ist ein Verzeichnis
grep: /home/felix/.cache/mozilla: Ist ein Verzeichnis
grep: /home/felix/.cache/mozilla/firefox: Ist ein Verzeichnis
grep: /home/felix/.cache/mozilla/firefox/it7tn5hm.default: Ist ein Verzeichnis
```

3.1.15 What does the cut command do? Can you use it together with w to produce a list of login names and CPU times corresponding to each active process? Can you now (all on the same command line) use sort and head or tail to find the user whose process is using the most CPU?



```
root@debian:~# w | tail -n +2 | tr -s " " | cut -d " " -f 1,7
USER PCPU
felix 0.04
root@debian:~# 
```



```
root@debian:~# w
 14:01:12 up  1:29,  1 user,  load average: 0,09, 0,07, 0,08
USER     TTY      VON              LOGIN@   IDLE   JCPU   PCPU WHAT
felix    tty7     tty7             12:57    1:29 m  0.04 s  0.03 s /usr/libexec/
gn
root@debian:~#
```

4 Kommentar

Diese Lecture + Exercise lehrt sehr viel über den sleep Befehl.