National Technical University of Ukraine
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Faculty of Informatics and Computer Science
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LINUX

INSTRUCTIONS FOR PERFORMING LABORATORY WORKS FOR
STUDENTS

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LABORATORY WORK #7

Topic

Process management in LINUX

Tasks

Work with process management commands (ps, bg, fg, jobs, kill, killall, nohup, SIGHUP, SIGTERM, SIGK, pgerp, pkill, screen, htop, top, free, nice, renice).

Task 1: Work with basic process management commands
ps:
● Display information about active processes.

```
mehmet@mehmet-VirtualBox:~$ ps aux
USER        PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root          1  0.0  0.1 184288 13080 ?        Ss   19:41   0:01 /sbin/init sp
root          2  0.0  0.0      0     0 ?        S    19:41   0:00 [kthreadd]
root          3  0.0  0.0      0     0 ?        I<   19:41   0:00 [rcu_gp]
root          4  0.0  0.0      0     0 ?        I<   19:41   0:00 [rcu_par_gp]
root          5  0.0  0.0      0     0 ?        I<   19:41   0:00 [slub_flushwq
root          6  0.0  0.0      0     0 ?        I<   19:41   0:00 [netns]
root          8  0.0  0.0      0     0 ?        I<   19:41   0:00 [kworker/0:0H
root         10  0.0  0.0      0     0 ?        I<   19:41   0:00 [mm_percpu_wq
root         11  0.0  0.0      0     0 ?        I    19:41   0:00 [rcu_tasks_kt
root         12  0.0  0.0      0     0 ?        I    19:41   0:00 [rcu_tasks_ru
root         13  0.0  0.0      0     0 ?        I    19:41   0:00 [rcu_tasks_tr
root         14  0.0  0.0      0     0 ?        S    19:41   0:00 [ksoftirqd/0]
root         15  0.0  0.0      0     0 ?        I    19:41   0:02 [rcu_preempt]
root         16  0.0  0.0      0     0 ?        S    19:41   0:00 [migration/0]
root         17  0.0  0.0      0     0 ?        S    19:41   0:00 [idle_inject/
root         19  0.0  0.0      0     0 ?        S    19:41   0:00 [cpuhp/0]
root         20  0.0  0.0      0     0 ?        S    19:41   0:00 [cpuhp/1]
root         21  0.0  0.0      0     0 ?        S    19:41   0:00 [idle_inject/
root         22  0.0  0.0      0     0 ?        S    19:41   0:00 [migration/1]
root         23  0.0  0.0      0     0 ?        S    19:41   0:00 [ksoftirqd/1]
root         24  0.0  0.0      0     0 ?        I    19:41   0:00 [kworker/1:0-
root         25  0.0  0.0      0     0 ?        I<   19:41   0:00 [kworker/1:0H
root         26  0.0  0.0      0     0 ?        S    19:41   0:00 [cpuhp/2]
root         27  0.0  0.0      0     0 ?        S    19:41   0:00 [idle_inject/
root         28  0.0  0.0      0     0 ?        S    19:41   0:00 [migration/2]
root         29  0.0  0.0      0     0 ?        S    19:41   0:00 [ksoftirqd/2]
root         31  0.0  0.0      0     0 ?        I<   19:41   0:00 [kworker/2:0H
root         32  0.0  0.0      0     0 ?        S    19:41   0:00 [cpuhp/3]
root         33  0.0  0.0      0     0 ?        S    19:41   0:00 [idle_inject/
root         34  0.0  0.0      0     0 ?        S    19:41   0:00 [migration/3]
root         35  0.0  0.0      0     0 ?        S    19:41   0:00 [ksoftirqd/3]
root         37  0.0  0.0      0     0 ?        I<   19:41   0:00 [kworker/3:0H
root         38  0.0  0.0      0     0 ?        S    19:41   0:00 [kdevtmpfs]
root         39  0.0  0.0      0     0 ?        I<   19:41   0:00 [inet_frag_wq
root         40  0.0  0.0      0     0 ?        S    19:41   0:00 [kauditd]
```

```
root           41  0.0  0.0      0     0 ?        S    19:41   0:00 [khungtaskd]
root           42  0.0  0.0      0     0 ?        S    19:41   0:00 [oom_reaper]
root           44  0.0  0.0      0     0 ?        I<   19:41   0:00 [writeback]
root           46  0.0  0.0      0     0 ?        S    19:41   0:00 [kcompactd0]
root           47  0.0  0.0      0     0 ?        SN   19:41   0:00 [ksmd]
root           48  0.0  0.0      0     0 ?        SN   19:41   0:00 [khugepaged]
root           49  0.0  0.0      0     0 ?        I<   19:41   0:00 [kintegrityd]
root           50  0.0  0.0      0     0 ?        I<   19:41   0:00 [kblockd]
root           51  0.0  0.0      0     0 ?        I<   19:41   0:00 [blkcg_punt_b
root           52  0.0  0.0      0     0 ?        I<   19:41   0:00 [tpm_dev_wq]
root           53  0.0  0.0      0     0 ?        I<   19:41   0:00 [ata_sff]
root           54  0.0  0.0      0     0 ?        I<   19:41   0:00 [md]
root           55  0.0  0.0      0     0 ?        I<   19:41   0:00 [edac-poller]
root           56  0.0  0.0      0     0 ?        I<   19:41   0:00 [devfreq_wq]
root           57  0.0  0.0      0     0 ?        S    19:41   0:00 [watchdogd]
root           59  0.0  0.0      0     0 ?        I<   19:41   0:00 [kworker/0:1H
root           60  0.0  0.0      0     0 ?        S    19:41   0:00 [kswapd0]
root           61  0.0  0.0      0     0 ?        S    19:41   0:00 [ecryptfs-kth
root           62  0.0  0.0      0     0 ?        I<   19:41   0:00 [kthrotld]
root           63  0.0  0.0      0     0 ?        I<   19:41   0:00 [acpi_thermal
root           66  0.0  0.0      0     0 ?        S    19:41   0:00 [scsi_eh_0]
root           67  0.0  0.0      0     0 ?        I<   19:41   0:00 [scsi_tmf_0]
root           68  0.0  0.0      0     0 ?        S    19:41   0:00 [scsi_eh_1]
root           69  0.0  0.0      0     0 ?        I<   19:41   0:00 [scsi_tmf_1]
root           73  0.0  0.0      0     0 ?        I<   19:41   0:00 [mld]
root           74  0.0  0.0      0     0 ?        I<   19:41   0:00 [ipv6_addrcon
root           76  0.0  0.0      0     0 ?        I<   19:41   0:00 [kworker/1:1H
root           84  0.0  0.0      0     0 ?        I<   19:41   0:00 [kstrp]
root           86  0.0  0.0      0     0 ?        I<   19:41   0:00 [zswap-shrink
root           87  0.0  0.0      0     0 ?        I<   19:41   0:00 [kworker/u9:0
root           91  0.0  0.0      0     0 ?        I<   19:41   0:00 [charger_mana
root          138  0.0  0.0      0     0 ?        I<   19:41   0:00 [kworker/2:1H
root          141  0.0  0.0      0     0 ?        S    19:41   0:00 [scsi_eh_2]
root          142  0.0  0.0      0     0 ?        I<   19:41   0:00 [scsi_tmf_2]
root          174  0.0  0.0      0     0 ?        S    19:41   0:00 [jbd2/sda4-8]
root          175  0.0  0.0      0     0 ?        I<   19:41   0:00 [ext4-rsv-con
```

```
root          214  0.0  0.1  48088 19712 ?        S<s  19:41   0:01 /lib/systemd/
root          247  0.0  0.0      0     0 ?        S    19:41   0:00 [irq/18-vmwgf
root          261  0.0  0.0  26988  6912 ?        Ss   19:41   0:00 /lib/systemd/
root          297  0.0  0.0      0     0 ?        I<   19:41   0:00 [kworker/3:2H
root          305  0.0  0.0      0     0 ?        I<   19:41   0:00 [cryptd]
systemd+      563  0.1  0.0  14828  6912 ?        Ss   19:41   0:05 /lib/systemd/
systemd+      571  0.0  0.1  25532 13656 ?        Ss   19:41   0:00 /lib/systemd/
systemd+      572  0.0  0.0  89380  7296 ?        Ssl  19:41   0:00 /lib/systemd/
root          596  0.0  0.0 243056  7652 ?        Ssl  19:41   0:00 /usr/libexec/
root          597  0.0  0.0   2812  1664 ?        Ss   19:41   0:00 /usr/sbin/acp
avahi         600  0.0  0.0   7628  3840 ?        Ss   19:41   0:00 avahi-daemon:
root          601  0.0  0.0  12244  2944 ?        Ss   19:41   0:00 /usr/sbin/cro
message+      603  0.0  0.0  10908  6144 ?        Ss   19:41   0:01 @dbus-daemon
root          605  0.0  0.1 264108 18780 ?        Ssl  19:41   0:00 /usr/sbin/Net
root          611  0.0  0.0  82696  3840 ?        Ssl  19:41   0:00 /usr/sbin/irq
root          612  0.0  0.2  43788 20716 ?        Ss   19:41   0:00 /usr/bin/pyth
root          614  0.0  0.1 246336 11356 ?        Ssl  19:41   0:00 /usr/libexec/
root          616  0.0  0.0 243092  7552 ?        Ssl  19:41   0:00 /usr/libexec/
syslog        618  0.0  0.0 222400  5760 ?        Ssl  19:41   0:00 /usr/sbin/rsy
root          627  0.1  0.3 1467428 32576 ?       Ssl  19:41   0:04 /usr/lib/snap
root          628  0.0  0.0 239260  6656 ?        Ssl  19:41   0:00 /usr/libexec/
root          631  0.0  0.0  23636  8092 ?        Ss   19:41   0:00 /lib/systemd/
root          632  0.0  0.1 393208 13088 ?        Ssl  19:41   0:00 /usr/libexec/
root          633  0.0  0.0  16496  6272 ?        Ss   19:41   0:00 /sbin/wpa_sup
avahi         636  0.0  0.0   7440  1408 ?        S    19:41   0:00 avahi-daemon:
root          695  0.0  0.1 317956 12404 ?        Ssl  19:41   0:00 /usr/sbin/Mod
root          712  0.0  0.2 120788 23280 ?        Ssl  19:41   0:00 /usr/bin/pyth
root          737  0.0  0.1  75236 13184 ?        Ss   19:41   0:00 /usr/sbin/cup
root          739  0.0  0.0 244128  9088 ?        Ssl  19:41   0:00 /usr/sbin/gdm
root          750  0.0  0.1 394536 10752 ?        Sl   19:41   0:00 gdm-session-w
root          777  0.0  0.1 172620 11392 ?        Ssl  19:41   0:00 /usr/sbin/cup
kernoops      787  0.0  0.0  13084  2340 ?        Ss   19:41   0:00 /usr/sbin/ker
kernoops      791  0.0  0.0  13084  2316 ?        Ss   19:41   0:00 /usr/sbin/ker
mehmet        836  0.0  0.1  17976 10496 ?        Ss   19:41   0:02 /lib/systemd/
mehmet        839  0.0  0.0 169844  5856 ?        S    19:41   0:00 (sd-pam)
mehmet        845  0.0  0.0  42316  6144 ?        S<sl 19:41   0:00 /usr/bin/pipe

mehmet       1280  0.0  0.0 239264  6528 ?        Ssl  19:41   0:00 /usr/libexec/
mehmet       1281  0.0  0.1 469052 10752 ?        Ssl  19:41   0:00 /usr/libexec/
mehmet       1283  0.0  0.0 462892  8704 ?        Ssl  19:41   0:00 /usr/libexec/
mehmet       1287  0.0  0.0 322468  9984 ?        Ssl  19:41   0:00 /usr/libexec/
mehmet       1304  0.0  0.2 344172 21864 ?        Ssl  19:41   0:00 /usr/libexec/
mehmet       1325  0.0  0.0 232264  7680 ?        Sl   19:41   0:00 /usr/libexec/
mehmet       1335  0.0  0.0 240360  7424 ?        Sl   19:41   0:00 /usr/libexec/
mehmet       1338  0.0  0.2 350752 28460 ?        Sl   19:41   0:01 /usr/libexec/
mehmet       1345  0.0  0.6 757444 67136 ?        Sl   19:41   0:00 /usr/libexec/
mehmet       1355  0.0  0.0 240284  7680 ?        Sl   19:41   0:00 /usr/libexec/
mehmet       1402  0.0  0.1 345332 15232 ?        Sl   19:41   0:00 /usr/libexec/
mehmet       1432  0.0  0.0 166532  7552 ?        Sl   19:41   0:01 /usr/libexec/
mehmet       1479  0.0  0.2 347408 25088 ?        Ssl  19:41   0:00 /usr/libexec/
colord       1494  0.0  0.1 248372 13020 ?        Ssl  19:41   0:00 /usr/libexec/
mehmet       1519  0.0  0.2 2606672 28212 ?       Sl   19:41   0:00 /usr/bin/gjs
mehmet       1575  0.0  0.0 165996  6656 ?        Ssl  19:41   0:00 /usr/libexec/
mehmet       2245  0.1  0.5 557280 52772 ?        Rsl  19:42   0:07 /usr/libexec/
mehmet       2282  0.0  0.3 497608 31876 ?        Sl   19:42   0:00 update-notifi
mehmet       3350  0.0  0.0  13884  4864 pts/1    Ss+  19:58   0:00 bash
root         3622  0.0  0.0      0     0 ?        I    20:04   0:01 [kworker/3:1-
root         4261  0.0  0.0      0     0 ?        I    20:17   0:00 [kworker/0:2-
root         4461  0.0  0.0      0     0 ?        I    20:21   0:00 [kworker/1:2-
root         4733  0.0  0.0      0     0 ?        I    20:25   0:00 [kworker/0:0-
root         4738  0.0  0.0      0     0 ?        I    20:26   0:00 [kworker/2:0-
root         4920  0.0  0.0      0     0 ?        I    20:30   0:00 [kworker/u8:2
root         4938  0.0  0.0      0     0 ?        I    20:31   0:00 [kworker/3:0]
root         5206  0.0  0.0      0     0 ?        R    20:36   0:00 [kworker/u8:0
root         5454  0.0  0.0      0     0 ?        I    20:41   0:00 [kworker/u8:1
root         5613  0.0  0.0      0     0 ?        I    20:43   0:00 [kworker/2:2-
mehmet       5906  0.2  0.3 402028 31364 ?        SNsl 20:50   0:00 /usr/libexec/
root         5913  0.6  0.0 302544  8960 ?        Ssl  20:50   0:00 /usr/libexec/
mehmet       5932  3.1  0.4 491072 44944 ?        Sl   20:50   0:00 /usr/bin/naut
mehmet       5939  3.5  0.6 2859836 60388 ?       Sl   20:50   0:00 gjs /usr/shar
mehmet       5958  2.0  0.2 384656 28092 ?        Sl   20:50   0:00 /usr/bin/file
mehmet       5974  0.0  0.0  13884  4992 pts/0    Ss   20:50   0:00 bash
mehmet       5981  0.0  0.0  15428  3328 pts/0    R+   20:51   0:00 ps aux
mehmet@mehmet-VirtualBox:~$
```

bg and fg:
● Run a process in the background or bring it to the foreground.

```
меnmet      3981  0.0  0.0  13428   3328 pts/0     R+    20:31   0:00 ps aux
mehmet@mehmet-VirtualBox:~$ echo "echo'hello world'" >test.script.sh
mehmet@mehmet-VirtualBox:~$ ls
%1                  directory           file2_sorted.txt  mehmet.txt        snap
1.txt               dosya               file2.txt         Müzik             subdir
2.tct               dosya1              Genel             my_archive.tar.gz  Şablonlar
2.txt               dosya1_sorted.txt   hellofile.txt     newdirectory      test.script.sh
Belgeler            dosyaa              İndirilenler      newfile           try.txt
city_1              example.txt         input.txt         new_pass.txt      Videolar
city_country.txt    file                Masaüstü          new.txt
destination_file.txt  file1_sorted.txt  mehmet1.txt       output.txt
dir1                file1.txt           mehmet2.txt       Resimler
mehmet@mehmet-VirtualBox:~$ fg %1
bash: fg: %1: böyle bir iş yok
mehmet@mehmet-VirtualBox:~$ fg
bash: fg: geçerli: böyle bir iş yok
```

jobs:
● Display a list of jobs running in the background.

```
mehmet@mehmet-VirtualBox:~$ jobs
mehmet@mehmet-VirtualBox:~$
```

kill:
● Terminate a process by specifying its process ID (PID).

```
  GNU nano 6.2                        test_script.sh *
vim test_script.sh
echo "hello this is a test file"
echo"&(pwd)"




                            [ 3 satırlarını oku ]
^G Yardım        ^O Yaz         ^W Nerede      ^K Kes        ^T Çalıştır    ^C Konum
^X Çık           ^R Dosya Oku   ^\ Değiştir    ^U Yapıştır   ^J Yasla       ^/ Satıra Git
```

```
mehmet@mehmet-VirtualBox:~$ nano test_script.sh
mehmet@mehmet-VirtualBox:~$ chmod +x test_script.sh
mehmet@mehmet-VirtualBox:~$ ./test_script.sh
./test_script.sh: satır 1: vim: komut yok
hello this is a test file
./test_script.sh: satır 3: echo&(pwd): komut yok
```

```
mehmet@mehmet-VirtualBox:~$ test_script.sh &
[1] 11846
mehmet@mehmet-VirtualBox:~$ test_script.sh: komut bulunamadı
11846
11846: komut bulunamadı
```

killall:
● Terminate a process by its name.

```
mehmet@mehmet-VirtualBox:~$ test_script.sh &
[1] 11955
mehmet@mehmet-VirtualBox:~$ test_script.sh: komut bulunamadı
killall test_script.sh
test_script.sh: hiçbir işlem bulunamadı
[1]+  Çıkış 127          test_script.sh
mehmet@mehmet-VirtualBox:~$
```

nohup:
● Run a command immune to hangups, with output to a non-tty.

```
[1]+  Çıkış 127          nohup ./test_script.sh
mehmet@mehmet-VirtualBox:~$ nohub test.script.sh &
[1] 12320
mehmet@mehmet-VirtualBox:~$ 'nohub' Komutu bulunamadı, şunu mu demek istiyorsunuz:
  komut 'nohup' deb coreutils (8.32-4.1ubuntu1) paketinden
Şunu deneyin: sudo apt install <deb adı>
nohub test.script.sh &
[2] 12341
[1]   Çıkış 127          nohub test.script.sh
mehmet@mehmet-VirtualBox:~$ 'nohub' Komutu bulunamadı, şunu mu demek istiyorsunuz:
  komut 'nohub' deb coreutils (8.32-4.1ubuntu1) paketinden
Şunu deneyin: sudo apt install <deb adı>
```

SIGHUP, SIGTERM, SIGKILL:
● These are signals used to control processes.
● Example:

```
[2]  ÇIKIŞ 127          nonub test.script.sh
mehmet@mehmet-VirtualBox:~$ kill -SIGHUB PID
bash: kill: SIGHUB: sinyal belirtimi geçersiz
mehmet@mehmet-VirtualBox:~$ kill -SIGHUB 127
bash: kill: SIGHUB: sinyal belirtimi geçersiz
mehmet@mehmet-VirtualBox:~$ kıll -SIGTERM 127
'kıll' Komutu bulunamadı, şunu mu demek istiyorsunuz:
  komut 'kill' deb procps (2:3.3.17-6ubuntu2) paketinden
şunu deneyin: sudo apt install <deb adı>
mehmet@mehmet-VirtualBox:~$ kill -SIGTERM 127
bash: kill: (127) - Böyle bir süreç yok
mehmet@mehmet-VirtualBox:~$ kill -SIGKILL 127
bash: kill: (127) - Böyle bir süreç yok
mehmet@mehmet-VirtualBox:~$
```

Task 2:

Work with advanced process management commands

pgrep:
● List processes based on name

```
mehmet@mehmet-VirtualBox:~$ test_script.sh &
[1] 12656
mehmet@mehmet-VirtualBox:~$ test_script.sh: komut bulunamadı
pgrep test_script.sh &
[2] 12739
[1]   Çıkış 127          test_script.sh
mehmet@mehmet-VirtualBox:~$
```

pkill:
● Send a signal to processes based on name

```
[1]  Çıkış 127          test_script.sh
 mehmet@mehmet-VirtualBox:~$ pkill test_script.sh
 [2]+  Çıkış 1           pgrep test_script.sh
 mehmet@mehmet-VirtualBox:~$
```

screen:
● Create and manage multiple terminal sessions

```
[2]+  Çıkış 1           pgrep test_script.sh
mehmet@mehmet-VirtualBox:~$ sudo apt install screen
Paket listeleri okunuyor... Bitti
Bağımlılık ağacı oluşturuluyor... Bitti
Durum bilgisi okunuyor... Bitti
Aşağıdaki ek paketler kurulacak:
  libutempter0
Önerilen paketler:
  byobu | screenie | iselect ncurses-term
Aşağıdaki YENİ paketler kurulacak:
  libutempter0 screen
0 paket yükseltilecek, 2 yeni paket kurulacak, 0 paket kaldırılacak ve 150 paket yükseltilmeyece
k.
680 kB arşiv dosyası indirilecek.
```

htop:
● Interactive process viewer.


```
  0[|||                              3.3%] Tasks: 109, 245 thr, 87 kthr; 1 running
  1[|                                1.3%] Load average: 0.26 0.31 0.30
  2[|||                              3.9%] Uptime: 03:40:58
  3[                                 0.0%]
Mem[|||||||||||              762M/9.59G]
Swp[                             0K/1.97G]

  Main   I/O
   PID USER       PRI  NI  VIRT   RES   SHR S  CPU%▽MEM%   TIME+  Command
  1018 mehmet      20   0 4245M  256M  120M S   5.2  2.6  1:49.71 /usr/bin/gnome-shell
 14569 mehmet      20   0  5936  4736  3456 R   3.2  0.0  0:00.41 /snap/htop/3873/usr/local/bin
  2245 mehmet      20   0  547M 55880 42224 S   2.6  0.6  0:27.28 /usr/libexec/gnome-terminal-s
     1 root        20   0  179M 13080  8344 S   0.0  0.1  0:02.58 /sbin/init splash
   214 root        19  -1 64604 32128 30848 S   0.0  0.3  0:04.41 /lib/systemd/systemd-journald
   261 root        20   0 26988  6912  4608 S   0.0  0.1  0:00.21 /lib/systemd/systemd-udevd
   563 systemd-oo  20   0 14828  6912  6144 S   0.0  0.1  0:12.68 /lib/systemd/systemd-oomd
   571 systemd-re  20   0 25532 13656  9472 S   0.0  0.1  0:00.46 /lib/systemd/systemd-resolved
   572 systemd-ti  20   0 89380  7296  6528 S   0.0  0.1  0:00.13 /lib/systemd/systemd-timesync
   587 systemd-ti  20   0 89380  7296  6528 S   0.0  0.1  0:00.00 /lib/systemd/systemd-timesync
   596 root        20   0  237M  7652  7012 S   0.0  0.1  0:01.39 /usr/libexec/accounts-daemon
   597 root        20   0  2812  1664  1664 S   0.0  0.0  0:00.85 /usr/sbin/acpid
   600 avahi       20   0  7628  3840  3584 S   0.0  0.0  0:00.27 avahi-daemon: running [mehmet
   601 root        20   0 12244  2944  2688 S   0.0  0.0  0:00.03 /usr/sbin/cron -f -P
   603 messagebus  20   0 10904  6144  3968 S   0.0  0.1  0:02.33 @dbus-daemon --system --addre
   605 root        20   0  329M 19036 16092 S   0.0  0.2  0:01.12 /usr/sbin/NetworkManager --no
   611 root        20   0 82696  3840  3584 S   0.0  0.0  0:00.64 /usr/sbin/irqbalance --foregr
   612 root        20   0 43788 20716 11648 S   0.0  0.2  0:00.17 /usr/bin/python3 /usr/bin/net
   614 root        20   0  240M 11484  7896 S   0.0  0.1  0:00.45 /usr/libexec/polkitd --no-deb
   616 root        20   0  237M  7552  7040 S   0.0  0.1  0:00.02 /usr/libexec/power-profiles-d
   618 syslog      20   0  217M  5760  4352 S   0.0  0.1  0:01.66 /usr/sbin/rsyslogd -n -iNONE
   627 root        20   0 1433M 36792 20352 S   0.0  0.4  0:06.35 /usr/lib/snapd/snapd
   628 root        20   0  233M  6656  6144 S   0.0  0.1  0:00.01 /usr/libexec/switcheroo-contr
   629 root        20   0  240M 11484  7896 S   0.0  0.1  0:00.00 /usr/libexec/polkitd --no-deb
   630 root        20   0  237M  7652  7012 S   0.0  0.1  0:01.30 /usr/libexec/accounts-daemon
   631 root        20   0 23636  8092  6912 S   0.0  0.1  0:00.20 /lib/systemd/systemd-logind
F1Help  F2Setup  F3Search F4Filter F5Tree  F6SortBy F7Nice -F8Nice +F9Kill   F10Quit
```

top:
● Display and update sorted information about system processes

```
 mehmet@mehmet-VirtualBox: ~    ×      mehmet@mehmet-VirtualBox: ~   ×        mehmet@mehmet-VirtualBox: ~   ×        ⌄

top - 23:23:00 up  3:41,  1 user,  load average: 0,37, 0,35, 0,31
Tasks: 196 total,   1 running, 194 sleeping,   1 stopped,   0 zombie
%Cpu(s):  0,0 us,  1,3 sy,  0,0 ni, 98,7 id,  0,0 wa,  0,0 hi,  0,0 si,  0,0 st
MiB Mem :   9816,2 total,   7648,4 free,    772,1 used,   1395,7 buff/cache
MiB Swap:   2020,0 total,   2020,0 free,      0,0 used.   8753,1 avail Mem

   PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
  1018 mehmet    20   0 4346980 262332 123332 S  15,0   2,6   1:50.20 gnome-shell
  1262 mehmet    20   0  318544  12376   7296 S   5,0   0,1   0:09.34 ibus-daemon
  2245 mehmet    20   0  560936  55880  42224 S   5,0   0,6   0:27.45 gnome-terminal-
 12743 root      20   0       0      0      0 I   5,0   0,0   0:00.67 kworker/0:1-events
     1 root      20   0  184288  13080   8344 S   0,0   0,1   0:02.58 systemd
     2 root      20   0       0      0      0 S   0,0   0,0   0:00.03 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       0 -20       0      0      0 I   0,0   0,0   0:00.00 slub_flushwq
     6 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 netns
     8 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 kworker/0:0H-events_hig+
    10 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 mm_percpu_wq
    11 root      20   0       0      0      0 I   0,0   0,0   0:00.00 rcu_tasks_kthread
    12 root      20   0       0      0      0 I   0,0   0,0   0:00.00 rcu_tasks_rude_kthread
    13 root      20   0       0      0      0 I   0,0   0,0   0:00.00 rcu_tasks_trace_kthread
    14 root      20   0       0      0      0 S   0,0   0,0   0:00.23 ksoftirqd/0
    15 root      20   0       0      0      0 I   0,0   0,0   0:07.02 rcu_preempt
    16 root      rt   0       0      0      0 S   0,0   0,0   0:00.09 migration/0
    17 root     -51   0       0      0      0 S   0,0   0,0   0:00.00 idle_inject/0
    19 root      20   0       0      0      0 S   0,0   0,0   0:00.00 cpuhp/0
    20 root      20   0       0      0      0 S   0,0   0,0   0:00.00 cpuhp/1
    21 root     -51   0       0      0      0 S   0,0   0,0   0:00.00 idle_inject/1
    22 root      rt   0       0      0      0 S   0,0   0,0   0:00.89 migration/1
    23 root      20   0       0      0      0 S   0,0   0,0   0:00.24 ksoftirqd/1
    25 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 kworker/1:0H-events_hig+
    26 root      20   0       0      0      0 S   0,0   0,0   0:00.00 cpuhp/2
    27 root     -51   0       0      0      0 S   0,0   0,0   0:00.00 idle_inject/2
    28 root      rt   0       0      0      0 S   0,0   0,0   0:00.88 migration/2
    29 root      20   0       0      0      0 S   0,0   0,0   0:00.25 ksoftirqd/2
    31 root       0 -20       0      0      0 I   0,0   0,0   0:00.00 kworker/2:0H-events_hig+
```

free:
● Display amount of free and used memory in the system.

```
mehmet@mehmet-VirtualBox:~$ free
              total        used        free      shared  buff/cache   available
Bellek:    10051740      775196     7847332       36536     1429212     8978640
Takas:      2068476           0     2068476
mehmet@mehmet-VirtualBox:~$
```

nice and renice:
● Set or adjust the priority of a process.

```
mehmet@mehmet-VirtualBox:~$ nice -n 10 echo "mehmet"
mehmet
mehmet@mehmet-VirtualBox:~$
```