1. Вывести список всех процессов системы.

```
user@Ubuntu:~$ ps aux
USER         PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root           1  0.7  0.3  22996 14044 ?        Ss   12:16   0:04 /sbin/init sp
root           2  0.0  0.0      0     0 ?        S    12:16   0:00 [kthreadd]
root           3  0.0  0.0      0     0 ?        S    12:16   0:00 [pool_workque
root           4  0.0  0.0      0     0 ?        I<   12:16   0:00 [kworker/R-rc
root           5  0.0  0.0      0     0 ?        I<   12:16   0:00 [kworker/R-sy
root           6  0.0  0.0      0     0 ?        I<   12:16   0:00 [kworker/R-kv
root           7  0.0  0.0      0     0 ?        I<   12:16   0:00 [kworker/R-sl
root           8  0.0  0.0      0     0 ?        I<   12:16   0:00 [kworker/R-ne
root          10  0.0  0.0      0     0 ?        I    12:16   0:00 [kworker/0:1-
root          12  0.1  0.0      0     0 ?        I    12:16   0:00 [kworker/u8:0
root          13  0.0  0.0      0     0 ?        I<   12:16   0:00 [kworker/R-mm
root          14  0.0  0.0      0     0 ?        I    12:16   0:00 [rcu_tasks_kt
root          15  0.0  0.0      0     0 ?        I    12:16   0:00 [rcu_tasks_ru
root          16  0.0  0.0      0     0 ?        I    12:16   0:00 [rcu_tasks_tr
root          17  0.0  0.0      0     0 ?        S    12:16   0:00 [ksoftirqd/0]
root          18  0.2  0.0      0     0 ?        I    12:16   0:01 [rcu_preempt]
root          19  0.0  0.0      0     0 ?        S    12:16   0:00 [rcu_exp_par_
root          20  0.0  0.0      0     0 ?        S    12:16   0:00 [rcu_exp_gp_k
root          21  0.0  0.0      0     0 ?        S    12:16   0:00 [migration/0]
root          22  0.0  0.0      0     0 ?        S    12:16   0:00 [idle_inject/
root          23  0.0  0.0      0     0 ?        S    12:16   0:00 [cpuhp/0]
root          24  0.0  0.0      0     0 ?        S    12:16   0:00 [cpuhp/1]
root          25  0.0  0.0      0     0 ?        S    12:16   0:00 [idle_inject/
root          26  0.0  0.0      0     0 ?        S    12:16   0:00 [migration/1]
root          27  0.0  0.0      0     0 ?        S    12:16   0:00 [ksoftirqd/1]
root          29  0.0  0.0      0     0 ?        I<   12:16   0:00 [kworker/1:0H
```

2. Вывести дерево процессов.

```
user@Ubuntu:~$ pstree -p
systemd(1)─┬─ModemManager(995)─┬─{ModemManager}(1014)
           │                   ├─{ModemManager}(1017)
           │                   └─{ModemManager}(1019)
           ├─NetworkManager(1304)─┬─{NetworkManager}(1305)
           │                      ├─{NetworkManager}(1306)
           │                      └─{NetworkManager}(1307)
           ├─accounts-daemon(907)─┬─{accounts-daemon}(937)
           │                      ├─{accounts-daemon}(938)
           │                      └─{accounts-daemon}(945)
           ├─avahi-daemon(880)───avahi-daemon(940)
           ├─colord(1712)─┬─{colord}(1717)
           │              ├─{colord}(1718)
           │              └─{colord}(1720)
           ├─cron(908)
           ├─cups-browsed(1412)─┬─{cups-browsed}(1428)
           │                    ├─{cups-browsed}(1429)
           │                    └─{cups-browsed}(1430)
           ├─cupsd(1159)
           ├─dbus-daemon(881)
           ├─gdm3(1557)─┬─gdm-session-wor(2355)─┬─gdm-wayland-ses(2453)─┬─gnome-session-b(2472)─┬─{gnome-session-b}(2549)
           │            │                       │                       │                       ├─{gnome-session-b}(2550)
           │            │                       │                       │                       └─{gnome-session-b}(2551)
           │            │                       │                       ├─{gdm-wayland-ses}(2465)
           │            │                       │                       ├─{gdm-wayland-ses}(2466)
           │            │                       │                       └─{gdm-wayland-ses}(2470)
           │            │                       ├─{gdm-session-wor}(2356)
           │            │                       ├─{gdm-session-wor}(2357)
           │            │                       └─{gdm-session-wor}(2358)
           │            ├─{gdm3}(1568)
           │            ├─{gdm3}(1569)
           │            └─{gdm3}(1570)
           ├─gnome-remote-de(884)─┬─{gnome-remote-de}(967)
           │                      ├─{gnome-remote-de}(968)
           │                      └─{gnome-remote-de}(971)
           ├─kerneloops(1416)
           ├─kerneloops(1421)
           ├─polkitd(888)─┬─{polkitd}(964)
           │              ├─{polkitd}(966)
```

3. С помощью команды top получить список 5 процессов, потребляющих наибольшее количество процессорного времени.

```
user@Ubuntu:~$ top -b -n 1 | head -12 | tail -6
    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
      1 root      20   0   23400  14420   9556 S   0.0   0.4   0:01.61 systemd
      2 root      20   0       0      0      0 S   0.0   0.0   0:00.01 kthreadd
      3 root      20   0       0      0      0 S   0.0   0.0   0:00.00 pool_wo+
      4 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker+
      5 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker+
```

4. Найти 2 процесса, имеющих более ДВУХ потоков. Использовать состояние процесса

```
user@Ubuntu:~$ ps -eLf | awk ' {print$2}' | sort | uniq -c | sort -rn | awk '$1>2' | head -2
     19 2738
     11 904
```

5. Используя команду top, изменить приоритеты 2 процессов.

```
user@Ubuntu:~$ top

top - 12:42:30 up 25 min,  1 user,  load average: 0.15, 0.14, 0.19
Tasks: 182 total,   2 running, 180 sleeping,   0 stopped,   0 zombie
%Cpu(s):  1.4 us,  0.3 sy,  0.0 ni, 98.3 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem :   3916.5 total,   1896.3 free,   1182.6 used,   1119.2 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.   2734.0 avail Mem
PID to renice [default pid = 2738]
    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
   2738 user      20   0 4170060 529132 153776 S   2.0  13.2   2:20.63 gnome-shell
     45 root      20   0       0      0      0 I   0.3   0.0   0:00.81 kworker/1:1-events
   3759 user      20   0  569356  60336  47920 R   0.3   1.5   0:18.91 gnome-terminal-
      1 root      20   0   22996  14044   9412 S   0.0   0.4   0:04.54 systemd
      2 root      20   0       0      0      0 S   0.0   0.0   0:00.01 kthreadd
      3 root      20   0       0      0      0 S   0.0   0.0   0:00.00 pool_workqueue_release
      4 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-rcu_gp
      5 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-sync_wq
      6 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-kvfree_rcu_reclaim
      7 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-slub_flushwq
      8 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/R-netns
     10 root      20   0       0      0      0 I   0.0   0.0   0:00.05 kworker/0:1-events
```

```
Renice PID 2738 to value
```

```
    PID USER      PR  NI
   2738 user      38  18
```

6. Получить список открытых файлов пользователя

```
user@Ubuntu:~$ lsof -u $(whoami)
COMMAND    PID USER   FD      TYPE             DEVICE  SIZE/OFF    NODE NAME
systemd   2369 user  cwd   unknown                                 /proc/2369/cwd (readlink: Permission denied)
systemd   2369 user  rtd   unknown                                 /proc/2369/root (readlink: Permission denied)
systemd   2369 user  txt   unknown                                 /proc/2369/exe (readlink: Permission denied)
systemd   2369 user    0   unknown                                 /proc/2369/fd/0 (readlink: Permission denied)
systemd   2369 user    1   unknown                                 /proc/2369/fd/1 (readlink: Permission denied)
systemd   2369 user    2   unknown                                 /proc/2369/fd/2 (readlink: Permission denied)
systemd   2369 user    3   unknown                                 /proc/2369/fd/3 (readlink: Permission denied)
systemd   2369 user    4   unknown                                 /proc/2369/fd/4 (readlink: Permission denied)
systemd   2369 user    5   unknown                                 /proc/2369/fd/5 (readlink: Permission denied)
systemd   2369 user    6   unknown                                 /proc/2369/fd/6 (readlink: Permission denied)
systemd   2369 user    7   unknown                                 /proc/2369/fd/7 (readlink: Permission denied)
systemd   2369 user    8   unknown                                 /proc/2369/fd/8 (readlink: Permission denied)
systemd   2369 user    9   unknown                                 /proc/2369/fd/9 (readlink: Permission denied)
systemd   2369 user   10   unknown                                 /proc/2369/fd/10 (readlink: Permission denied)
systemd   2369 user   11   unknown                                 /proc/2369/fd/11 (readlink: Permission denied)
systemd   2369 user   12   unknown                                 /proc/2369/fd/12 (readlink: Permission denied)
systemd   2369 user   13   unknown                                 /proc/2369/fd/13 (readlink: Permission denied)
systemd   2369 user   14   unknown                                 /proc/2369/fd/14 (readlink: Permission denied)
systemd   2369 user   15   unknown                                 /proc/2369/fd/15 (readlink: Permission denied)
systemd   2369 user   16   unknown                                 /proc/2369/fd/16 (readlink: Permission denied)
systemd   2369 user   17   unknown                                 /proc/2369/fd/17 (readlink: Permission denied)
systemd   2369 user   18   unknown                                 /proc/2369/fd/18 (readlink: Permission denied)
systemd   2369 user   19   unknown                                 /proc/2369/fd/19 (readlink: Permission denied)
systemd   2369 user   20   unknown                                 /proc/2369/fd/20 (readlink: Permission denied)
systemd   2369 user   21   unknown                                 /proc/2369/fd/21 (readlink: Permission denied)
systemd   2369 user   22   unknown                                 /proc/2369/fd/22 (readlink: Permission denied)
systemd   2369 user   23   unknown                                 /proc/2369/fd/23 (readlink: Permission denied)
systemd   2369 user   24   unknown                                 /proc/2369/fd/24 (readlink: Permission denied)
systemd   2369 user   29   unknown                                 /proc/2369/fd/29 (readlink: Permission denied)
systemd   2369 user   30   unknown                                 /proc/2369/fd/30 (readlink: Permission denied)
systemd   2369 user   31   unknown                                 /proc/2369/fd/31 (readlink: Permission denied)
systemd   2369 user   32   unknown                                 /proc/2369/fd/32 (readlink: Permission denied)
systemd   2369 user   33   unknown                                 /proc/2369/fd/33 (readlink: Permission denied)
systemd   2369 user   34   unknown                                 /proc/2369/fd/34 (readlink: Permission denied)
systemd   2369 user   35   unknown                                 /proc/2369/fd/35 (readlink: Permission denied)
systemd   2369 user   36   unknown                                 /proc/2369/fd/36 (readlink: Permission denied)
systemd   2369 user   37   unknown                                 /proc/2369/fd/37 (readlink: Permission denied)
systemd   2369 user   38   unknown                                 /proc/2369/fd/38 (readlink: Permission denied)
systemd   2369 user   39   unknown                                 /proc/2369/fd/39 (readlink: Permission denied)
systemd   2369 user   40   unknown                                 /proc/2369/fd/40 (readlink: Permission denied)
systemd   2369 user   41   unknown                                 /proc/2369/fd/41 (readlink: Permission denied)
systemd   2369 user   42   unknown                                 /proc/2369/fd/42 (readlink: Permission denied)
```

7. Получить текущее состояние системной памяти

```
user@Ubuntu:~$ free -h
               total        used        free      shared  buff/cache   available
Mem:           3.8Gi       1.2Gi       1.8Gi        58Mi       1.1Gi       2.7Gi
Swap:             0B          0B          0B
```

8. Получить справку об использовании дискового пространства.

```
user@Ubuntu:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
tmpfs           392M  1.7M  391M   1% /run
/dev/sda2        25G  5.3G   18G  23% /
tmpfs           2.0G     0  2.0G   0% /dev/shm
tmpfs           5.0M  8.0K  5.0M   1% /run/lock
tmpfs           392M  148K  392M   1% /run/user/1000
```

9. Вывести информацию о каком-либо процессе, используя содержимое каталога /proc

```
user@Ubuntu:~$ cat /proc/1/status
Name:   systemd
Umask:  0000
State:  S (sleeping)
Tgid:   1
Ngid:   0
Pid:    1
PPid:   0
TracerPid:      0
Uid:    0       0       0       0
Gid:    0       0       0       0
FDSize: 512
Groups:
NStgid: 1
NSpid:  1
NSpgid: 1
NSsid:  1
Kthread:        0
VmPeak:    23400 kB
VmSize:    22996 kB
VmLck:         0 kB
VmPin:         0 kB
VmHWM:     14044 kB
VmRSS:     14044 kB
RssAnon:             4632 kB
RssFile:             9412 kB
RssShmem:               0 kB
VmData:     3968 kB
VmStk:       132 kB
VmExe:        44 kB
VmLib:     12192 kB
VmPTE:        88 kB
VmSwap:        0 kB
HugetlbPages:           0 kB
CoreDumping:    0
THP_enabled:    1
untag_mask:     0xffffffffffffffff
Threads:        1
SigQ:   1/15348
```

10. Вывести информацию о процессоре ПК, используя содержимое каталога /proc

```
user@Ubuntu: ~$ cat /proc/cpuinfo
processor       : 0
vendor_id       : AuthenticAMD
cpu family      : 21
model           : 56
model name      : AMD PRO A8-8650B R7, 10 Compute Cores 4C+6G
stepping        : 1
microcode       : 0x6000626
cpu MHz         : 3194.048
cache size      : 2048 KB
physical id     : 0
siblings        : 2
core id         : 0
cpu cores       : 2
apicid          : 0
initial apicid  : 0
fpu             : yes
fpu_exception   : yes
cpuid level     : 13
wp              : yes
flags           : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt rd
 lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid tsc_known_freq pni pclmulqdq ssse3 fma cx16 sse4_1 sse4_2 x2apic popcnt aes xsave avx f
hypervisor lahf_lm cmp_legacy cr8_legacy abm sse4a misalignsse 3dnowprefetch ssbd vmmcall fsgsbase bmi1 arat
bugs            : fxsave_leak sysret_ss_attrs null_seg spectre_v1 spectre_v2 retbleed
bogomips        : 6388.09
TLB size        : 1536 4K pages
clflush size    : 64
cache_alignment : 64
address sizes   : 48 bits physical, 48 bits virtual
power management:

processor       : 1
vendor_id       : AuthenticAMD
cpu family      : 21
model           : 56
model name      : AMD PRO A8-8650B R7, 10 Compute Cores 4C+6G
stepping        : 1
microcode       : 0x6000626
cpu MHz         : 3194.048
cache size      : 2048 KB
physical id     : 0
siblings        : 2
```

11. Вывести список модулей, используемых в настоящий момент ядром ОС.

```
user@Ubuntu:~$ lsmod
Module                  Size  Used by
snd_seq_dummy          12288  0
snd_hrtimer            12288  1
qrtr                   53248  2
snd_intel8x0           53248  1
snd_ac97_codec        196608  1 snd_intel8x0
ac97_bus               12288  1 snd_ac97_codec
snd_pcm               192512  2 snd_intel8x0,snd_ac97_codec
snd_seq_midi           24576  0
snd_seq_midi_event     16384  1 snd_seq_midi
snd_rawmidi            57344  1 snd_seq_midi
snd_seq               122880  9 snd_seq_midi,snd_seq_midi_event,snd_seq_dummy
polyval_clmulni        12288  0
polyval_generic        12288  1 polyval_clmulni
ghash_clmulni_intel    16384  0
sha256_ssse3           32768  0
snd_seq_device         16384  3 snd_seq,snd_seq_midi,snd_rawmidi
sha1_ssse3             32768  0
snd_timer              53248  3 snd_seq,snd_hrtimer,snd_pcm
snd                   143360  11 snd_seq,snd_seq_device,snd_intel8x0,snd_timer,snd_ac97_codec,snd_pcm,snd_rawmidi
aesni_intel           122880  0
vmwgfx                466944  1
i2c_piix4              32768  0
drm_ttm_helper         16384  2 vmwgfx
ttm                   118784  2 vmwgfx,drm_ttm_helper
crypto_simd            16384  1 aesni_intel
vboxguest              57344  0
i2c_smbus              20480  1 i2c_piix4
soundcore              16384  1 snd
cryptd                 24576  2 crypto_simd,ghash_clmulni_intel
joydev                 32768  0
input_leds             12288  0
mac_hid                12288  0
serio_raw              20480  0
binfmt_misc            24576  1
sch_fq_codel           24576  2
msr                    12288  0
parport_pc             53248  0
ppdev                  24576  0
lp                     28672  0
```