```
user@box:~$ hostname
box
user@box:~$ env
SHELL=/bin/bash
WINDOWID=0
QT_ACCESSIBILITY=1
XDG_CONFIG_DIRS=/etc/xdg/xdg-Lubuntu:/etc/xdg:/etc:/usr/share
XDG_SESSION_PATH=/org/freedesktop/DisplayManager/Session1
XDG_MENU_PREFIX=lxqt-
LANGUAGE=
LC_ADDRESS=en_US.UTF-8
LC_NAME=en_US.UTF-8
SSH_AUTH_SOCK=/tmp/ssh-pAXsYDUkUXCM/agent.979
XDG_DATA_HOME=/home/user/.local/share
XDG_CONFIG_HOME=/home/user/.config
DESKTOP_SESSION=Lubuntu
LXQT_SESSION_CONFIG=session
LC_MONETARY=en_US.UTF-8
SSH_AGENT_PID=1058
XDG_SEAT=seat0
PWD=/home/user
XDG_SESSION_DESKTOP=
LOGNAME=user
QT_QPA_PLATFORMTHEME=lxqt
XDG_SESSION_TYPE=x11
GPG_AGENT_INFO=/run/user/1000/gnupg/S.gpg-agent:0:1
XAUTHORITY=/home/user/.Xauthority
HOME=/home/user
LC_PAPER=en_US.UTF-8
LANG=en_US.UTF-8
LS_COLORS=rs=0:di=01;34:ln=01;36:mh=00:pi=40;33:so=01;35:do=01;35:bd=40;33;01
:cd=40;33;01:or=40;31;01:mi=00:su=37;41:sg=30;43:ca=30;41:tw=30;42:ow=34;42:s
t=37;44:ex=01;32:*.tar=01;31:*.tgz=01;31:*.arc=01;31:*.arj=01;31:*.taz=01;31:
*.lha=01;31:*.lz4=01;31:*.lzh=01;31:*.lzma=01;31:*.tlz=01;31:*.txz=01;31:*.tz
o=01;31:*.t7z=01;31:*.zip=01;31:*.z=01;31:*.dz=01;31:*.gz=01;31:*.lrz=01;31:*
.lz=01;31:*.lzo=01;31:*.xz=01;31:*.zst=01;31:*.tzst=01;31:*.bz2=01;31:*.bz=01
;31:*.tbz=01;31:*.tbz2=01;31:*.tz=01;31:*.deb=01;31:*.rpm=01;31:*.jar=01;31:*
.war=01;31:*.ear=01;31:*.sar=01;31:*.rar=01;31:*.alz=01;31:*.ace=01;31:*.zoo=
01;31:*.cpio=01;31:*.7z=01;31:*.rz=01;31:*.cab=01;31:*.wim=01;31:*.swm=01;31:
```
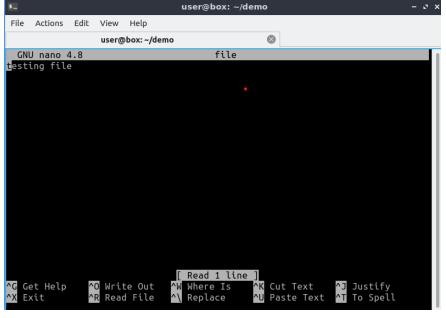
```
*.dwm=01;31:*.esd=01;31:*.jpg=01;35:*.jpeg=01;35:*.mjpg=01;35:*.mjpeg=01;35:*
.gif=01;35:*.bmp=01;35:*.pbm=01;35:*.pgm=01;35:*.ppm=01;35:*.tga=01;35:*.xbm=
01;35:*.xpm=01;35:*.tif=01;35:*.tiff=01;35:*.png=01;35:*.svg=01;35:*.svgz=01;
35:*.mng=01;35:*.pcx=01;35:*.mov=01;35:*.mpg=01;35:*.mpeg=01;35:*.m2v=01;35:*
.mkv=01;35:*.webm=01;35:*.ogm=01;35:*.mp4=01;35:*.m4v=01;35:*.mp4v=01;35:*.vo
b=01;35:*.qt=01;35:*.nuv=01;35:*.wmv=01;35:*.asf=01;35:*.rm=01;35:*.rmvb=01;3
5:*.flc=01;35:*.avi=01;35:*.fli=01;35:*.flv=01;35:*.gl=01;35:*.dl=01;35:*.xcf
=01;35:*.xwd=01;35:*.yuv=01;35:*.cgm=01;35:*.emf=01;35:*.ogv=01;35:*.ogx=01;3
5:*.aac=00;36:*.au=00;36:*.flac=00;36:*.m4a=00;36:*.mid=00;36:*.midi=00;36:*.
mka=00;36:*.mp3=00;36:*.mpc=00;36:*.ogg=00;36:*.ra=00;36:*.wav=00;36:*.oga=00
;36:*.opus=00;36:*.spx=00;36:*.xspf=00;36:
XDG_CURRENT_DESKTOP=LXQt
LXQT_DEFAULT_OPENBOX_CONFIG=/etc/xdg/xdg-Lubuntu/openbox/lxqt-rc.xml
XDG_SEAT_PATH=/org/freedesktop/DisplayManager/Seat0
GTK_CSD=0
XDG_CACHE_HOME=/home/user/.cache
LESSCLOSE=/usr/bin/lesspipe %s %s
XDG_SESSION_CLASS=user
TERM=xterm-256color
LC_IDENTIFICATION=en_US.UTF-8
GTK_OVERLAY_SCROLLING=0
LESSOPEN=| /usr/bin/lesspipe %s
USER=user
COLORFGBG=15;0
DISPLAY=:0
SHLVL=1
LC_TELEPHONE=en_US.UTF-8
LC_MEASUREMENT=en_US.UTF-8
XDG_VTNR=1
XDG_SESSION_ID=3
XDG_RUNTIME_DIR=/run/user/1000
QT_PLATFORM_PLUGIN=lxqt
LC_TIME=en_US.UTF-8
XDG_DATA_DIRS=/usr/share/Lubuntu:/usr/local/share:/usr/share:/var/lib/snapd/d
esktop
BROWSER=firefox
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:
/usr/local/games:/snap/bin
SAL_USE_VCLPLUGIN=qt5
```

```
                       user@box: ~/demo                    ⊗

DBUS_SESSION_BUS_ADDRESS=unix:path=/run/user/1000/bus
LC_NUMERIC=en_US.UTF-8
_=/usr/bin/env
user@box:~$ ps
    PID TTY          TIME CMD
   1569 pts/0    00:00:00 bash
   1581 pts/0    00:00:00 ps
user@box:~$ pwd
/home/user
user@box:~$ git clone https://github.com/kevinwlu/iot.git
Cloning into 'iot'...
remote: Enumerating objects: 11909, done.
remote: Counting objects: 100% (1802/1802), done.
remote: Compressing objects: 100% (767/767), done.
remote: Total 11909 (delta 1189), reused 1444 (delta 955), pack-reused 10107
Receiving objects: 100% (11909/11909), 9.12 MiB | 7.40 MiB/s, done.
Resolving deltas: 100% (7969/7969), done.
user@box:~$ cd iot
user@box:~/iot$ ls
lesson1    lesson2    lesson4    lesson6    lesson8    projects     special_problems
lesson10   lesson3    lesson5    lesson7    lesson9    README.md    standards
user@box:~/iot$ cd
user@box:~$ df
Filesystem      1K-blocks      Used Available Use% Mounted on
udev               971976         0    971976   0% /dev
tmpfs              203532      1076    202456   1% /run
/dev/sda1        30829512   5933532  23306884  21% /
tmpfs             1017644         0   1017644   0% /dev/shm
tmpfs                5120         4      5116   1% /run/lock
tmpfs             1017644         0   1017644   0% /sys/fs/cgroup
shared          499003716 330259920 168743796  67% /mnt/shared
tmpfs              203528         8    203520   1% /run/user/1000
user@box:~$ mkdir demo
user@box:~$ cd demo
user@box:~/demo$ nano file
user@box:~/demo$ nano file
user@box:~/demo$ cat file
cat: file: No such file or directory
user@box:~/demo$ nano file
```

```
$_                        user@box: ~/demo                   — ⛶ x

 File   Actions   Edit   View   Help

                       user@box: ~/demo                    ⊗

  GNU nano 4.8                    file
testing file




                        ●




                       [ Read 1 line ]
^G Get Help    ^O Write Out   ^W Where Is    ^K Cut Text    ^J Justify
^X Exit        ^R Read File   ^\ Replace     ^U Paste Text  ^T To Spell
```

```
user@box:~/demo$ cat file
testing file
user@box:~/demo$ cp file file2
user@box:~/demo$ mv file file2
user@box:~/demo$ rm file2
```

```
UNAME(1)                        User Commands                        UNAME(1)

NAME
       uname - print system information

SYNOPSIS
       uname [OPTION]...

DESCRIPTION
       Print certain system information.  With no OPTION, same as -s.

       -a, --all
              print all information, in the following order, except omit -p and -i if unknown:

       -s, --kernel-name
              print the kernel name

       -n, --nodename
              print the network node hostname

       -r, --kernel-release
              print the kernel release

       -v, --kernel-version
              print the kernel version

       -m, --machine
              print the machine hardware name

       -p, --processor
              print the processor type (non-portable)

       -i, --hardware-platform
              print the hardware platform (non-portable)

       -o, --operating-system
              print the operating system

 Manual page uname(1) line 1 (press h for help or q to quit)
```

```
user@box:~/demo$ man uname
user@box:~/demo$ uname -a
Linux box 5.4.0-29-generic #33-Ubuntu SMP Wed Apr 29 14:32:27 UTC 2020 x86_64 x86_64 x86_64 GNU/Linux
```

```
user@box:~/demo$ ifconfig
```

```
user@box:~/demo$ ping localhost
PING localhost(localhost (::1)) 56 data bytes
64 bytes from localhost (::1): icmp_seq=1 ttl=64 time=0.035 ms
64 bytes from localhost (::1): icmp_seq=2 ttl=64 time=0.092 ms
64 bytes from localhost (::1): icmp_seq=3 ttl=64 time=0.077 ms
64 bytes from localhost (::1): icmp_seq=4 ttl=64 time=0.078 ms
64 bytes from localhost (::1): icmp_seq=5 ttl=64 time=0.129 ms
64 bytes from localhost (::1): icmp_seq=6 ttl=64 time=0.150 ms
64 bytes from localhost (::1): icmp_seq=7 ttl=64 time=0.083 ms
64 bytes from localhost (::1): icmp_seq=8 ttl=64 time=0.080 ms
^C
--- localhost ping statistics ---
8 packets transmitted, 8 received, 0% packet loss, time 7151ms
rtt min/avg/max/mdev = 0.035/0.090/0.150/0.032 ms
```

```
user@box:~/demo$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 box:bootpc              _gateway:bootps         ESTABLISHED
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type       State         I-Node   Path
unix  3      [ ]         DGRAM                    16071    /run/systemd/notify
unix  2      [ ]         DGRAM                    25411    /run/user/1000/systemd/notify
unix  2      [ ]         DGRAM                    16088    /run/systemd/journal/syslog
unix  15     [ ]         DGRAM                    16098    /run/systemd/journal/dev-log
unix  7      [ ]         DGRAM                    16102    /run/systemd/journal/socket
unix  3      [ ]         STREAM     CONNECTED     18335
unix  3      [ ]         STREAM     CONNECTED     20351
unix  2      [ ]         DGRAM                    25395
unix  3      [ ]         STREAM     CONNECTED     18267
unix  3      [ ]         STREAM     CONNECTED     24257
unix  3      [ ]         STREAM     CONNECTED     19875    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     25415
unix  3      [ ]         STREAM     CONNECTED     18202
unix  3      [ ]         STREAM     CONNECTED     24794    /run/dbus/system_bus_socket
unix  3      [ ]         STREAM     CONNECTED     18817
unix  3      [ ]         STREAM     CONNECTED     19569
unix  3      [ ]         STREAM     CONNECTED     20352    /run/dbus/system_bus_socket
unix  2      [ ]         DGRAM                    25383
unix  3      [ ]         STREAM     CONNECTED     17263    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     18402
unix  3      [ ]         STREAM     CONNECTED     20348    /run/dbus/system_bus_socket
unix  3      [ ]         STREAM     CONNECTED     17243    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     18114
unix  3      [ ]         DGRAM                    25413
unix  3      [ ]         STREAM     CONNECTED     19476    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     20347
unix  3      [ ]         STREAM     CONNECTED     19966    /run/dbus/system_bus_socket
unix  3      [ ]         STREAM     CONNECTED     17265    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     18741
unix  3      [ ]         STREAM     CONNECTED     25786    /run/dbus/system_bus_socket
unix  3      [ ]         STREAM     CONNECTED     18191
unix  3      [ ]         STREAM     CONNECTED     20104    /run/systemd/journal/stdout
unix  2      [ ]         DGRAM                    19559
```

```
unix  3      [ ]          STREAM    CONNECTED     20365     /run/dbus/system_bus_socket
unix  2      [ ]          DGRAM                   19124
unix  3      [ ]          STREAM    CONNECTED     17253     /run/systemd/journal/stdout
unix  3      [ ]          STREAM    CONNECTED     19378
unix  3      [ ]          DGRAM                   25412
unix  3      [ ]          STREAM    CONNECTED     17272     /run/systemd/journal/stdout
unix  3      [ ]          STREAM    CONNECTED     19480     /run/systemd/journal/stdout
unix  3      [ ]          STREAM    CONNECTED     19964     /run/dbus/system_bus_socket
unix  2      [ ]          STREAM    CONNECTED     20345
unix  3      [ ]          STREAM    CONNECTED     19963     /run/dbus/system_bus_socket
unix  3      [ ]          STREAM    CONNECTED     25759     /run/systemd/journal/stdout
unix  3      [ ]          STREAM    CONNECTED     19123
unix  3      [ ]          STREAM    CONNECTED     19453
unix  3      [ ]          STREAM    CONNECTED     18112
unix  2      [ ]          STREAM    CONNECTED     20341
unix  3      [ ]          STREAM    CONNECTED     25590
unix  3      [ ]          STREAM    CONNECTED     21908     /run/dbus/system_bus_socket
unix  2      [ ]          DGRAM                   19960
unix  3      [ ]          STREAM    CONNECTED     25490
unix  3      [ ]          STREAM    CONNECTED     23098     /run/dbus/system_bus_socket
unix  3      [ ]          STREAM    CONNECTED     25585     /run/user/1000/bus
unix  3      [ ]          STREAM    CONNECTED     26743     /run/user/1000/bus
unix  2      [ ]          DGRAM                   26902
unix  3      [ ]          STREAM    CONNECTED     20569
unix  3      [ ]          STREAM    CONNECTED     25586
unix  3      [ ]          STREAM    CONNECTED     26740
unix  3      [ ]          STREAM    CONNECTED     20563
unix  3      [ ]          STREAM    CONNECTED     25918     @/tmp/.X11-unix/X0
unix  2      [ ]          DGRAM                   20763
unix  3      [ ]          STREAM    CONNECTED     19961
unix  2      [ ]          DGRAM                   25489
unix  3      [ ]          STREAM    CONNECTED     25562
unix  3      [ ]          STREAM    CONNECTED     26667     /run/user/1000/bus
unix  3      [ ]          STREAM    CONNECTED     25921     @/tmp/.X11-unix/X0
unix  3      [ ]          STREAM    CONNECTED     25491
unix  3      [ ]          STREAM    CONNECTED     23110
unix  3      [ ]          STREAM    CONNECTED     26054     /run/dbus/system_bus_socket
unix  3      [ ]          STREAM    CONNECTED     20768
unix  3      [ ]          STREAM    CONNECTED     22413
```