

Command Line Basics

1/2

Linux Essentials
Session-2



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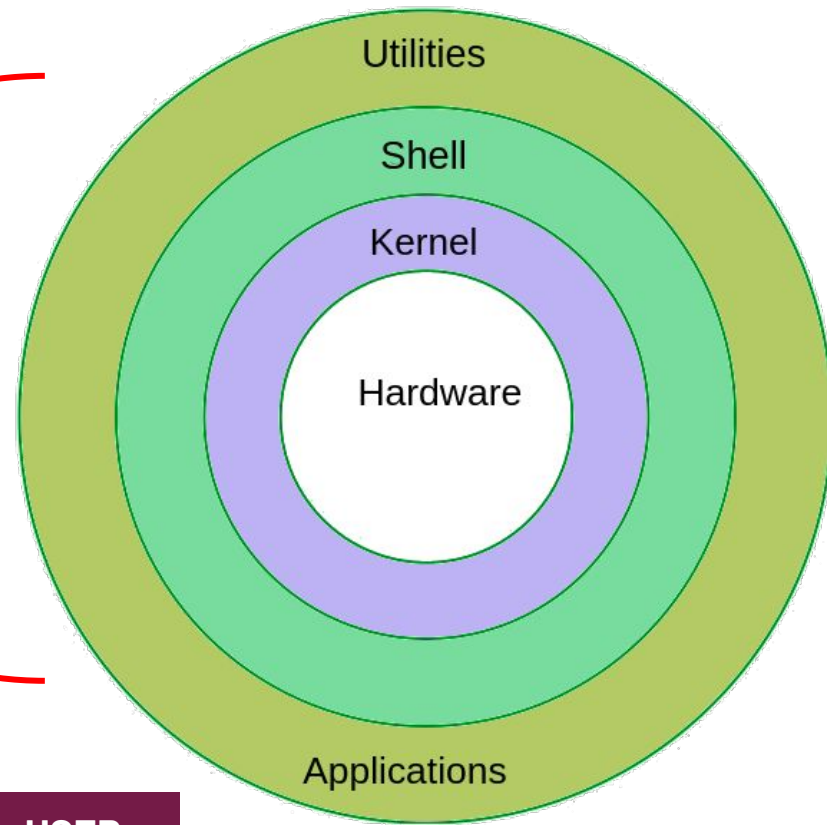
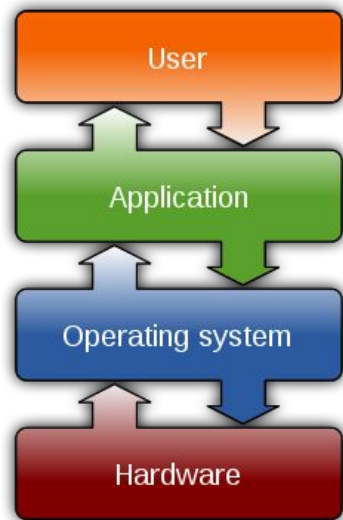
What is SHELL?

Basic SHELL Commands

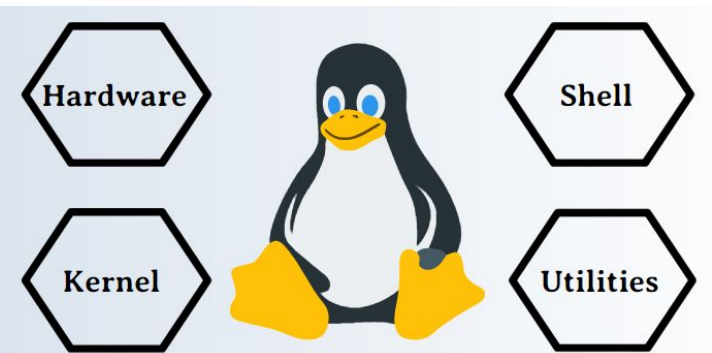
Case Sensitivity

Simple Globbing

Remembering the components of Linux



USER





Lets make an OS

How to we make an OS by means of programming?

```
main()
```

```
{
```

```
    Classes, event handlers, utilities, libraries frameworks, drivers. CLI,  
    GUI elements etc.
```

```
}
```



1

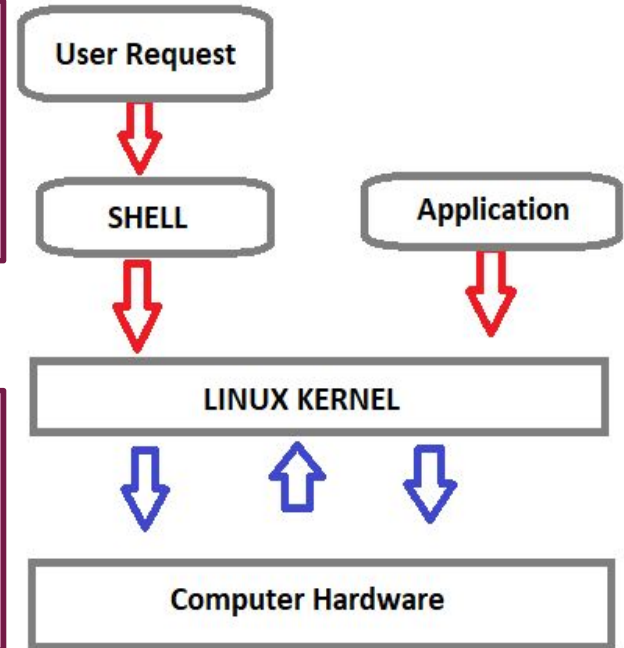
What is SHELL?



What is SHELL?

Shell is a program that receives the user's commands and gives them to the operating system to process and displays the output.

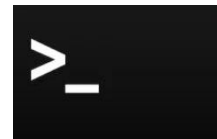
Bash (**B**ourne **A**gain **S**hell) is an enhanced version of Steve Bourne's first Unix shell application, and serves as the shell program on most Linux systems.



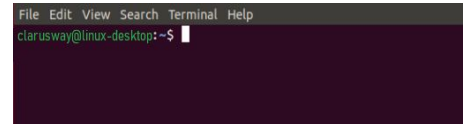


What is SHELL?

The standard Linux shell is both a command-line interpreter and a programming language.



The command prompt for Linux generally shows the current **user**, the current **host**, and the appropriate **directory**.



At the end of the prompt list, the \$(dollar sign) signifies the current user being unprivileged, and the device is ready to receive feedback.

The input is sent for parsing and execution to the interpreter.

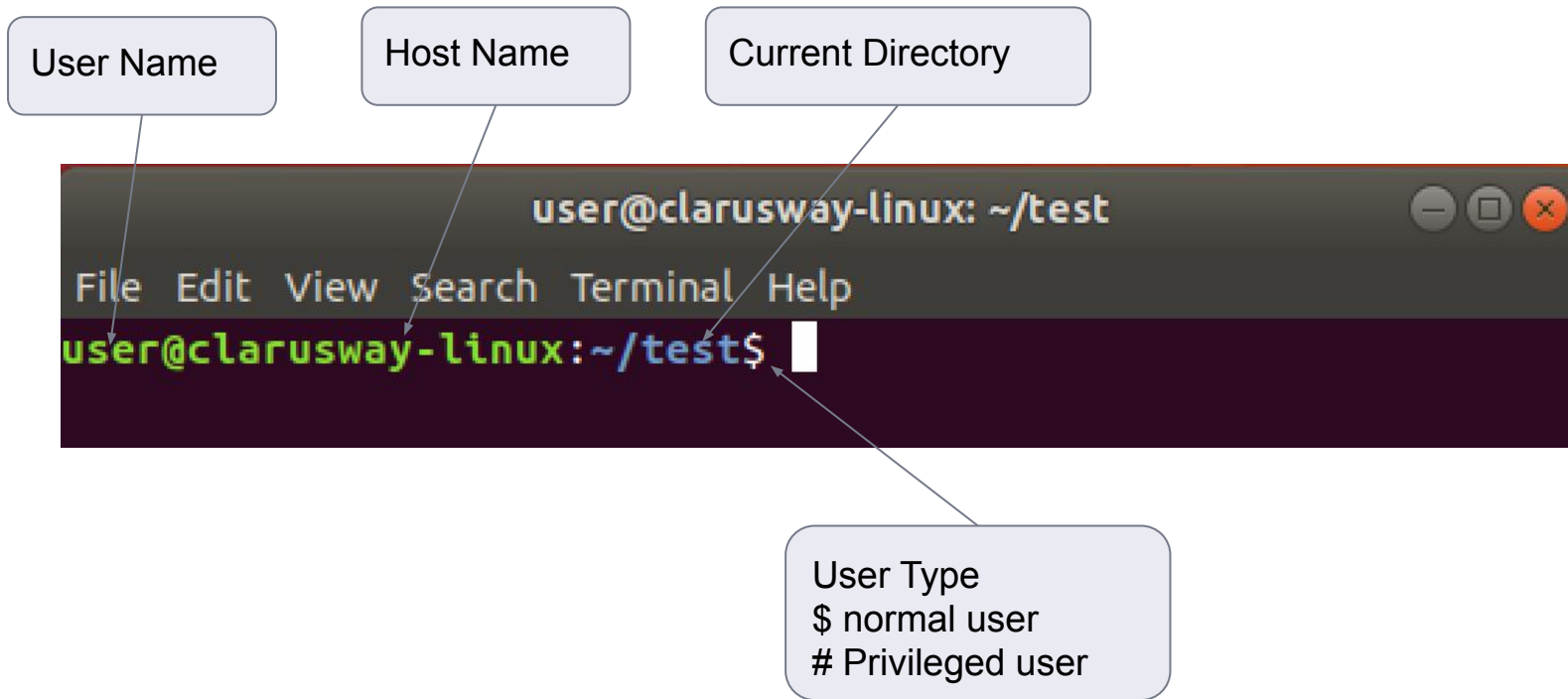


Types of SHELL's

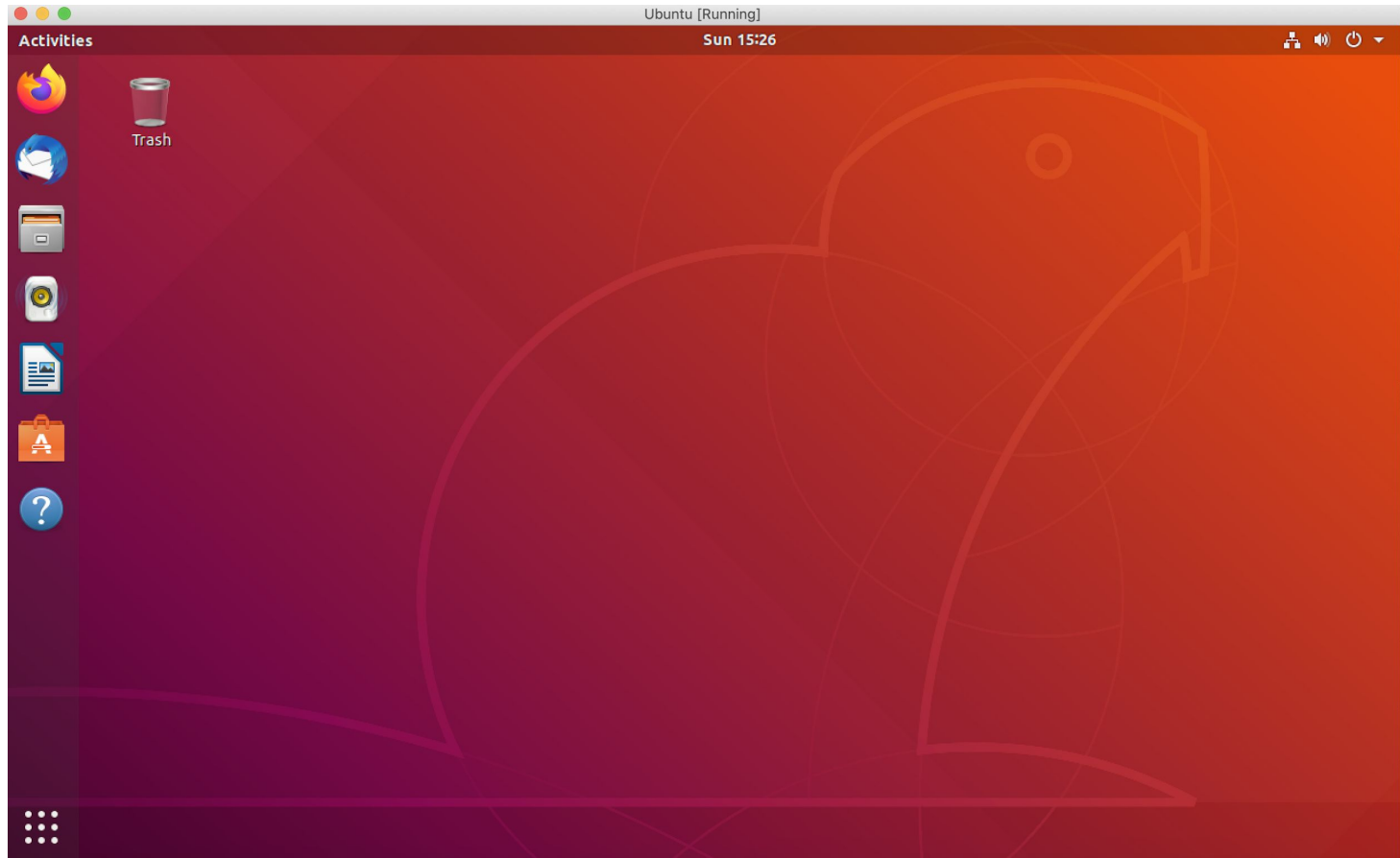
Shell	Complete path-name	Prompt for root user	Prompt for non root user
Bourne shell (sh)	/bin/sh and /sbin/sh	#	\$
GNU Bourne-Again shell (bash)	/bin/bash	bash-VersionNumber#	bash-VersionNumber\$
C shell (csh)	/bin/csh	#	%
Korn shell (ksh)	/bin/ksh	#	\$
Z Shell (zsh)	/bin/zsh	<hostname>#	<hostname>%



Command Prompt



GUI





VSCode in KUbuntu

```
sudo apt update
sudo apt upgrade -y
sudo apt update && sudo apt upgrade -y // Power users may do the same with this.
sudo apt install software-properties-common apt-transport-https wget
wget -q https://packages.microsoft.com/keys/microsoft.asc -O- | sudo apt-key add -
sudo add-apt-repository "deb [arch=amd64]
https://packages.microsoft.com/repos/vscode stable main"
sudo apt install code
sudo apt update && sudo apt upgrade -y
```

Its also possible to do the installation from UI as well. (Applications menu\Discover\ search vscode and find code)



Which one is not a user interface of Linux



Students choose an option

Pear Deck Interactive Slide
Do not remove this bar



Which one is not a user interface of Linux

☐ GNU

☐ CLI

☒ GUI



Students choose an option

Peer Deck Interactive Slide
The collaborative tool for

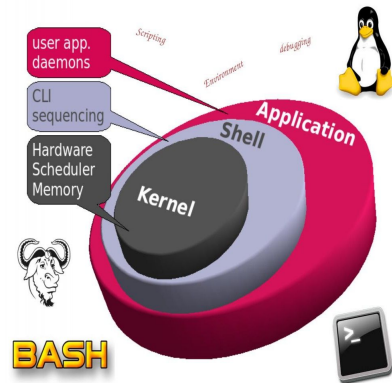
Draw or type 2 things you already know about Linux:

1

2



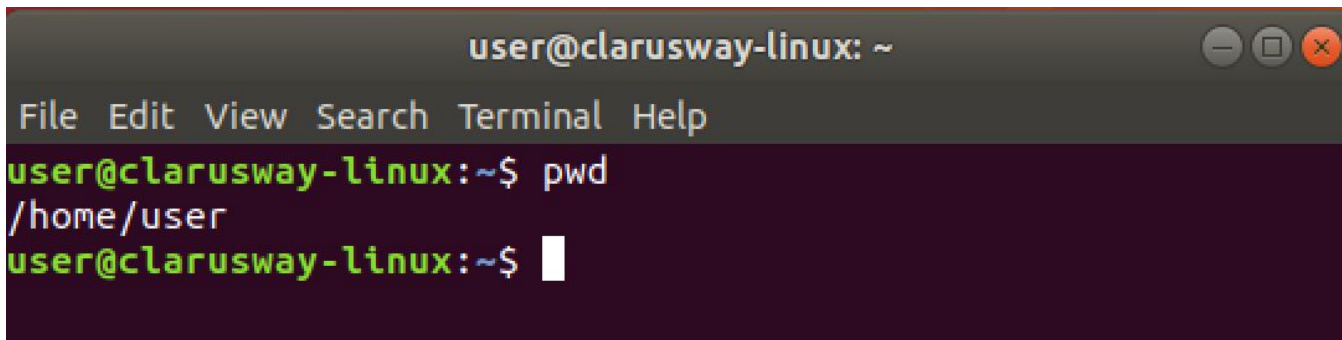
Basic SHELL Commands





Basic Shell Commands

pwd show current path



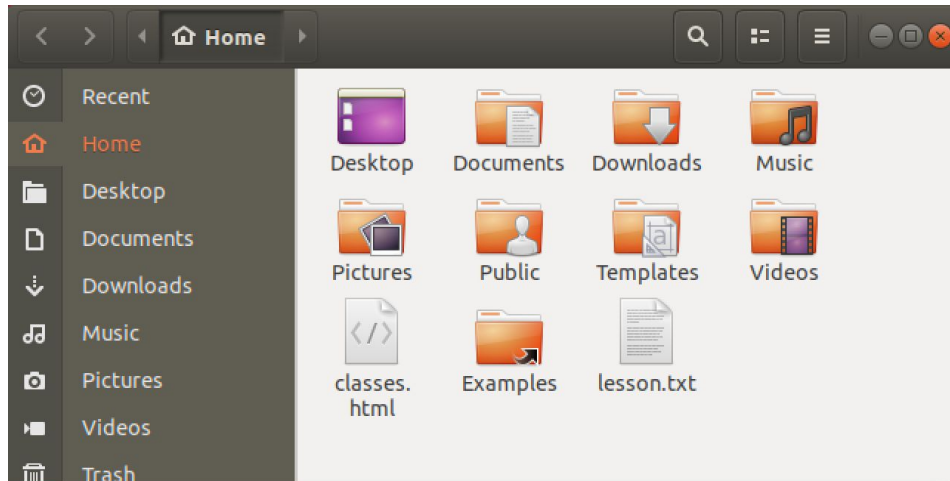
```
user@clarusway-linux: ~  
File Edit View Search Terminal Help  
user@clarusway-linux:~$ pwd  
/home/user  
user@clarusway-linux:~$
```


Basic Shell Commands



ls lists directory contents

ls -l lists directory contents with details



```
user@clarusway-linux: ~  
File Edit View Search Terminal Help  
user@clarusway-linux:~$ ls  
classes.html Downloads Music Templates  
Desktop examples.desktop Pictures Videos  
Documents lesson.txt Public  
user@clarusway-linux:~$
```

```
user@clarusway-linux: ~  
File Edit View Search Terminal Help  
user@clarusway-linux:~$ ls -l  
total 48  
-rw-r--r-- 1 user user 16 Mar 2 21:56 classes.html  
drwxr-xr-x 2 user user 4096 Mar 2 21:54 Desktop  
drwxr-xr-x 2 user user 4096 Mar 2 21:54 Documents  
drwxr-xr-x 2 user user 4096 Mar 2 21:54 Downloads  
-rw-r--r-- 1 user user 8980 Mar 2 21:53 examples.desktop  
-rw-r--r-- 1 user user 0 Mar 2 21:55 lesson.txt  
drwxr-xr-x 2 user user 4096 Mar 2 21:54 Music  
drwxr-xr-x 2 user user 4096 Mar 2 21:54 Pictures  
drwxr-xr-x 2 user user 4096 Mar 2 21:54 Public  
drwxr-xr-x 2 user user 4096 Mar 2 21:54 Templates  
drwxr-xr-x 2 user user 4096 Mar 2 21:54 Videos  
user@clarusway-linux:~$
```



Basic Shell Commands

- cd [dir]** change (current) directory
- cd ..** change current directory to one level up
- cd /** change current directory to the root directory
- cd ~** change current directory to the home directory

```
user@clarusway-linux: ~  
File Edit View Search Terminal Help  
user@clarusway-linux:~$ cd test  
user@clarusway-linux:~/test$ cd ..  
user@clarusway-linux:~$ cd /  
user@clarusway-linux:/$ cd ~  
user@clarusway-linux:~$
```



Basic Shell Commands

mkdir [dir] create a new directory

```
user@clarusway-linux: ~  
File Edit View Search Terminal Help  
user@clarusway-linux:~$ ls  
classes.html Downloads Music Templates  
Desktop examples.desktop Pictures test  
Documents lesson.txt Public Videos  
user@clarusway-linux:~$ mkdir clarusway  
user@clarusway-linux:~$ ls  
clarusway Downloads Pictures Videos  
classes.html examples.desktop Public  
Desktop lesson.txt Templates  
Documents Music test  
user@clarusway-linux:~$
```



Basic Shell Commands

rmdir [dir] delete an empty directory

```
user@clarusway-linux: ~  
File Edit View Search Terminal Help  
user@clarusway-linux:~$ ls  
clarusway Downloads Pictures Videos  
classes.html examples.desktop Public  
Desktop lesson.txt Templates  
Documents Music test  
user@clarusway-linux:~$ rmdir test  
user@clarusway-linux:~$ ls  
clarusway Documents lesson.txt Public  
classes.html Downloads Music Templates  
Desktop examples.desktop Pictures Videos  
user@clarusway-linux:~$
```

```
user@clarusway-linux: ~  
File Edit View Search Terminal Help  
user@clarusway-linux:~$ cd test  
user@clarusway-linux:~/test$ ls  
t.txt  
user@clarusway-linux:~/test$ cd ..  
user@clarusway-linux:~$ rmdir test  
rmdir: failed to remove 'test': Directory not empty  
user@clarusway-linux:~$ ls  
clarusway Downloads Pictures Videos  
classes.html examples.desktop Public  
Desktop lesson.txt Templates  
Documents Music test  
user@clarusway-linux:~$
```



Basic Shell Commands

touch create a file

```
user@clarusway-linux: ~  
File Edit View Search Terminal Help  
user@clarusway-linux:~$ ls  
clarusway      Downloads      Pictures      Videos  
classes.html  examples.desktop Public  
Desktop        lesson.txt     Templates  
Documents      Music          test  
user@clarusway-linux:~$ touch test-file.txt  
user@clarusway-linux:~$ ls  
clarusway      Downloads      Pictures      test-file.txt  
classes.html  examples.desktop Public      Videos  
Desktop        lesson.txt     Templates  
Documents      Music          test  
user@clarusway-linux:~$
```



Basic Shell Commands

rm delete a file

```
user@clarusway-linux: ~  
File Edit View Search Terminal Help  
user@clarusway-linux:~$ ls  
clarusway      Downloads      Pictures      test-file.txt  
classes.html  examples.desktop Public        Videos  
Desktop        lesson.txt    Templates  
Documents      Music         test  
user@clarusway-linux:~$ rm test-file.txt  
user@clarusway-linux:~$ ls  
clarusway      Downloads      Pictures      Videos  
classes.html  examples.desktop Public  
Desktop        lesson.txt    Templates  
Documents      Music         test  
user@clarusway-linux:~$
```




Basic Shell Commands

cp copy a file to another location

```
user@clarusway-linux: ~/test
File Edit View Search Terminal Help
user@clarusway-linux:~$ cd test
user@clarusway-linux:~/test$ ls
user@clarusway-linux:~/test$ cd ..
user@clarusway-linux:~$ cp test-file.txt test/
user@clarusway-linux:~$ ls
clarusway      Downloads      Pictures      test-file.txt
classes.html   examples.desktop Public        Videos
Desktop        lesson.txt     Templates
Documents      Music          test
user@clarusway-linux:~$ cd test
user@clarusway-linux:~/test$ ls
test-file.txt
user@clarusway-linux:~/test$
```



Basic Shell Commands

mv move a file to another location

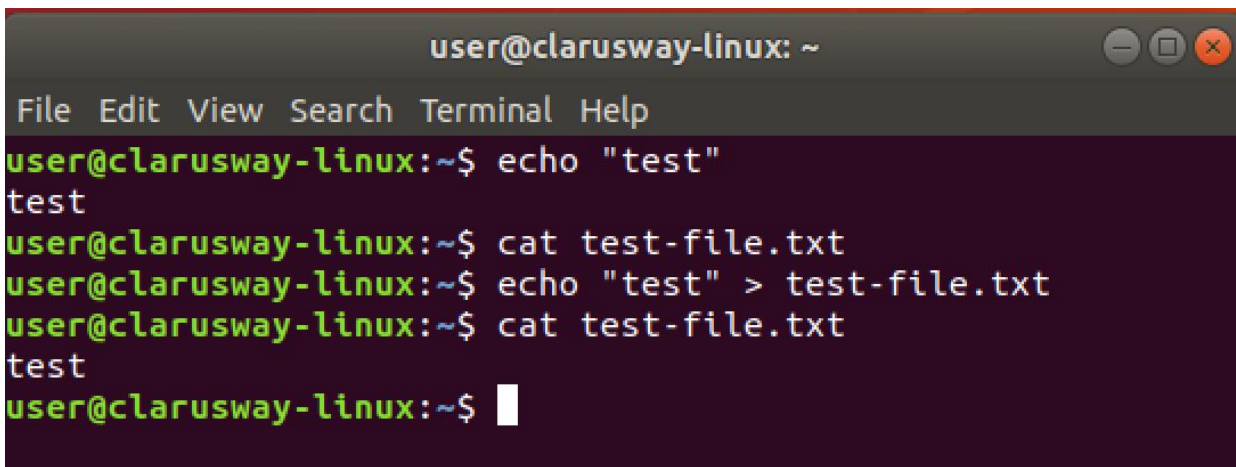
```
user@clarusway-linux: ~/test
File Edit View Search Terminal Help
user@clarusway-linux:~/test$ ls
user@clarusway-linux:~/test$ cd ..
user@clarusway-linux:~$ ls
clarusway      Downloads      Pictures      test-file.txt
classes.html   examples.desktop Public        Videos
Desktop        lesson.txt     Templates
Documents      Music          test
user@clarusway-linux:~$ mv test-file.txt test/
user@clarusway-linux:~$ ls
clarusway      Downloads      Pictures      Videos
classes.html   examples.desktop Public
Desktop        lesson.txt     Templates
Documents      Music          test
user@clarusway-linux:~$ cd test
user@clarusway-linux:~/test$ ls
test-file.txt
user@clarusway-linux:~/test$
```




Basic Shell Commands

echo print message to screen

echo > [file] print message into a file

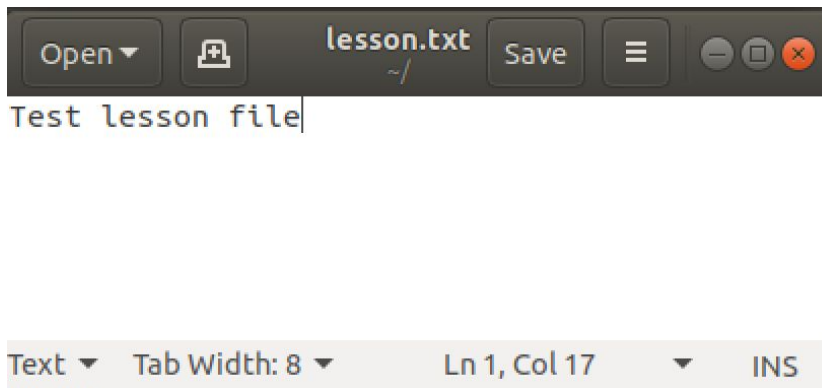


```
user@clarusway-linux: ~  
File Edit View Search Terminal Help  
user@clarusway-linux:~$ echo "test"  
test  
user@clarusway-linux:~$ cat test-file.txt  
user@clarusway-linux:~$ echo "test" > test-file.txt  
user@clarusway-linux:~$ cat test-file.txt  
test  
user@clarusway-linux:~$
```

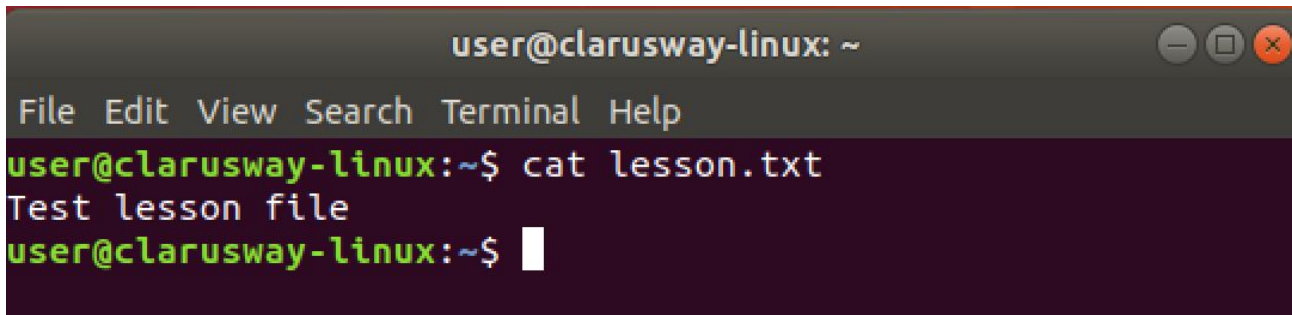


Basic Shell Commands

cat show file contents



A screenshot of a text editor window. The title bar shows 'lesson.txt' and the file path '~/'. The window contains the text 'Test lesson file'. The status bar at the bottom indicates 'Text', 'Tab Width: 8', 'Ln 1, Col 17', and 'INS'.

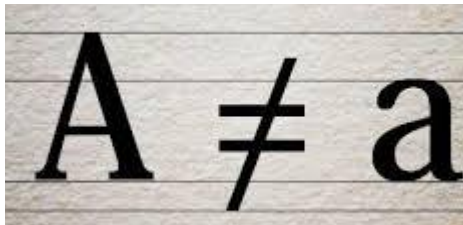


A screenshot of a terminal window with the title 'user@clarusway-linux: ~'. The terminal shows the command 'cat lesson.txt' being executed, which outputs 'Test lesson file'. The prompt 'user@clarusway-linux:~\$' is visible before and after the command.



Case Sensitivity

Most of the common Linux file systems are case sensitive; this is something to keep in mind when creating files or directories and moving through directories.



Lower-case and upper-case letters have different ASCII representation.



```
touch newfile  
touch Newfile
```

Will create two different files.

Multiple File/Directory Operations



- ? used for a single character
- * used for multiple characters.

```
user@clarusway-linux: ~  
File Edit View Search Terminal Help  
user@clarusway-linux:~$ ls  
clarusway      examples.desktop  Music           Videos  
classes.html  html.txt          Pictures        xml.txt  
Desktop        lessons           Public  
Documents      lesson.txt        Templates  
Downloads      linux.txt         test  
user@clarusway-linux:~$ ls l*.*  
lesson.txt  linux.txt  
user@clarusway-linux:~$ ls ?tml.txt  
html.txt  xml.txt  
user@clarusway-linux:~$
```



rm delete a file

rm -r new_directory
dolu dosyaları silebilirsiniz.

rmdir [dir] delete an empty directory

rmdir: failed to remove “zzz” : Directory not empty

▶ Exercise

 clarusway

 lessons


 linux.txt

“I love linux”

 html.txt

“I can create a website”

 materials

 pre-class

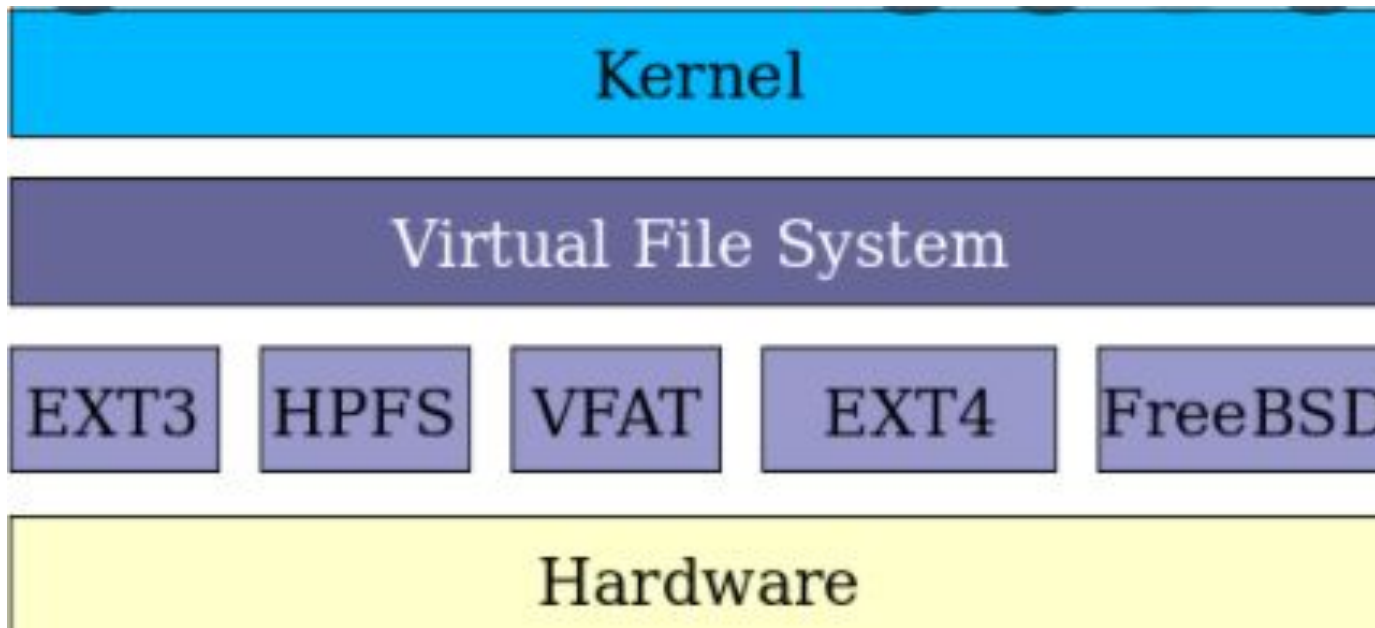
lms.txt

 post-class

try-it.txt



Linux file systems



Basic Shell Commands



find

```
/: bash — Konsole
File Edit View Bookmarks Plugins Settings Help
find: './run/user/1000/systemd/inaccessible/dir': Permission denied
find: './run/sudo': Permission denied
find: './run/cryptsetup': Permission denied
find: './run/credentials/systemd-sysusers.service': Permission denied
find: './run/systemd/resolve/netif': Permission denied
find: './run/systemd/propagate': Permission denied
find: './run/systemd/unit-root': Permission denied
find: './run/systemd/inaccessible/dir': Permission denied
find: './run/initramfs': Permission denied
find: './sys/kernel/tracing': Permission denied
find: './sys/kernel/debug': Permission denied
find: './sys/fs/pstore': Permission denied
find: './sys/fs/bpf': Permission denied
find: './GPUCache': Permission denied
./etc/thunderbird/syspref.js
find: './etc/cups/ssl': Permission denied
find: './etc/ssl/private': Permission denied
find: './etc/polkit-1/localauthority': Permission denied
./home/volkan/snap/firefox/common/.mozilla/firefox/g9vq0zps.default/prefs.js
./home/volkan/.vscode/extensions/wscats.cors-browser-1.0.11/out/extension.js
./home/volkan/.vscode/extensions/wscats.cors-browser-1.0.11/out/index.js
./home/volkan/.vscode/extensions/wscats.cors-browser-1.0.11/out/jade.js
./home/volkan/.vscode/extensions/wscats.cors-browser-1.0.11/out/config.js
./home/volkan/.vscode/extensions/wscats.cors-browser-1.0.11/out/util.js
./home/volkan/.vscode/extensions/wscats.cors-browser-1.0.11/node_modules/open/index.js
./home/volkan/.vscode/extensions/wscats.cors-browser-1.0.11/node_modules/is-wsl/index.js
./home/volkan/.vscode/extensions/wscats.cors-browser-1.0.11/node_modules/commander/index.js
find: './~': Permission denied
find: './CachedData/30d9c6cd9483b2cc586687151bcbcd635f373630/chrome': Permission denied
find: './lost+found': Permission denied
volkan@volkan-VirtualBox:/$
```


Basic Shell Commands



man

man pages

```
~: man — Konsole
File Edit View Bookmarks Plugins Settings Help

do not list implied . and ..

--author
  with -l, print the author of each file

-b, --escape
  print C-style escapes for nongraphic characters

--block-size=SIZE
  with -l, scale sizes by SIZE when printing them; e.g., '--block-size=M'; see SIZE format
  below

-B, --ignore-backups
  do not list implied entries ending with ~

-c      with -lt: sort by, and show, ctime (time of last modification of file status information);
        with -l: show ctime and sort by name; otherwise: sort by ctime, newest first

-C      list entries by columns

--color[=WHEN]
  colorize the output; WHEN can be 'always' (default if omitted), 'auto', or 'never'; more
  info below

-d, --directory
  list directories themselves, not their contents

-D, --dired
  generate output designed for Emacs' dired mode

Manual page ls(1) line 19 (press h for help or q to quit)
```

Basic Shell Commands



alias

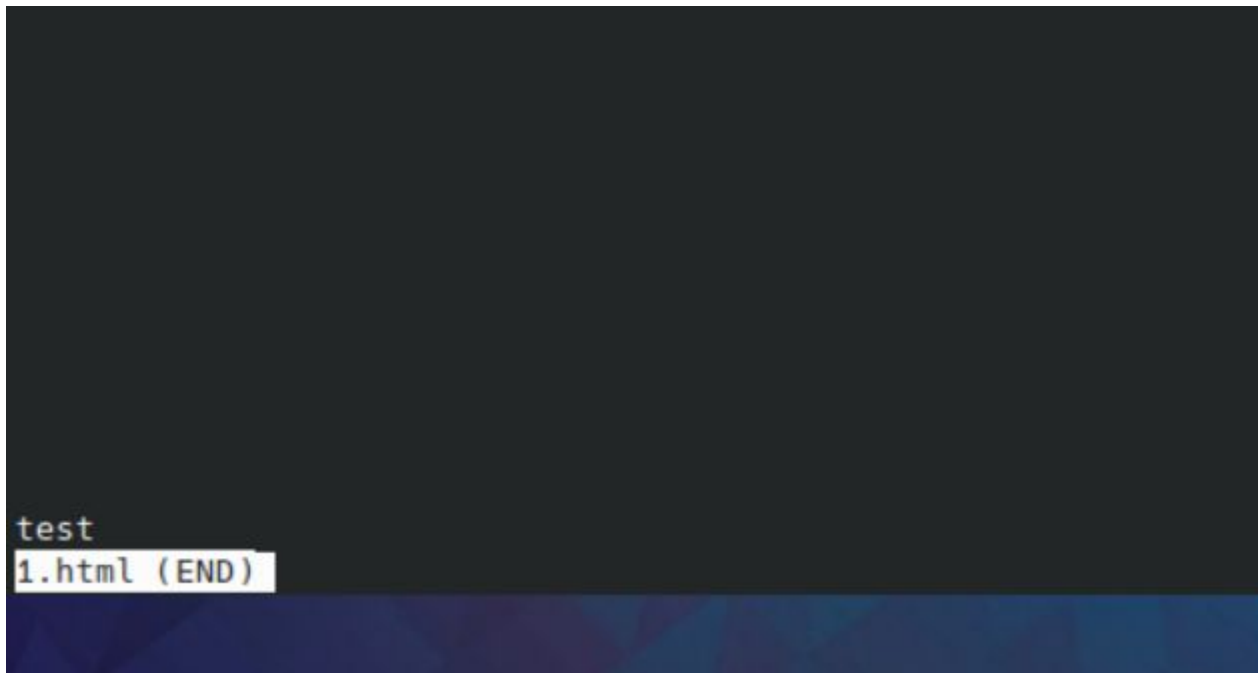
```
/: bash — Konsole
File Edit View Bookmarks Plugins Settings Help

find: './lost+found': Permission denied
volkan@volkan-VirtualBox:/$ alias ll='ls -al'
volkan@volkan-VirtualBox:/$ ll
total 2097364
drwxr-xr-x 37 root root      4096 Tem  6 12:56 .
drwxr-xr-x 37 root root      4096 Tem  6 12:56 ..
drwx----- 3 root root      4096 Tem  6 11:56 '~'
drwxr-xr-x 2 root root      4096 Tem  6 12:14 Backups
lrwxrwxrwx 1 root root         7 Tem  6 00:29 bin -> usr/bin
drwx----- 3 root root      4096 Tem  6 12:16 blob_storage
drwxr-xr-x 4 root root      4096 Tem  6 11:52 boot
drwx----- 3 root root      4096 Tem  6 12:15 Cache
drwxr-xr-x 3 root root      4096 Tem  6 12:15 CachedConfigurations
drwxr-xr-x 3 root root      4096 Tem  6 12:14 CachedData
drwxr-xr-x 2 root root      4096 Tem  6 12:15 CachedExtensions
drwxrwxr-x 2 root root      4096 Tem  6 00:35 cdrom
drwx----- 4 root root      4096 Tem  6 12:14 'Code Cache'
drwx----- 6 root root      4096 Tem  6 12:14 Crashpad
drwxr-xr-x 19 root root     4160 Tem  6 12:49 dev
drwxr-xr-x 138 root root    12288 Tem  6 11:51 etc
drwx----- 2 root root      4096 Tem  6 12:14 GPUCache
drwxr-xr-x 3 root root      4096 Tem  6 00:39 home
-rw-r--r-- 1 root root         2 Tem  6 12:15 languagepacks.json
lrwxrwxrwx 1 root root         7 Tem  6 00:29 lib -> usr/lib
lrwxrwxrwx 1 root root         9 Tem  6 00:29 lib32 -> usr/lib32
lrwxrwxrwx 1 root root         9 Tem  6 00:29 lib64 -> usr/lib64
lrwxrwxrwx 1 root root        10 Tem  6 00:29 libx32 -> usr/libx32
drwx----- 3 root root      4096 Tem  6 12:14 'Local Storage'
drwxr-xr-x 5 root root      4096 Tem  6 12:16 logs
drwx----- 2 root root    16384 Tem  6 00:28 lost+found
-rw-r--r-- 1 root root         36 Tem  6 12:15 machineid
```



Basic Shell Commands

less



The screenshot shows a dark terminal window with a blue patterned bar at the bottom. The text 'test' is displayed on the first line, and '1.html (END)' is displayed on the second line, indicating the end of the file content.

```
test
1.html (END)
```



Basic Shell Commands

tail

```
root@volkan-VirtualBox:/# tail -f /home/volkan/.config/Code/logs/20220706T114055/renderer1.log
[2022-07-06 11:41:34.134] [renderer1] [info] UNRESPONSIVE extension host: received responsive event and cancelling profiling session
[2022-07-06 11:41:37.411] [renderer1] [info] UNRESPONSIVE extension host: starting to profile NOW
[2022-07-06 11:41:37.638] [renderer1] [warning] UNRESPONSIVE extension host: 'vscode.github-authentication' took 100% of 444.101ms, saved PROFILE here: 'file:///tmp/exthost-26737f.cpubprofile' [{"id":"vscode.github-authentication","total":443252,"percentage":100}]
```



Basic Shell Commands

grep

```
volkan@volkan-VirtualBox:~$ grep test 1.html  
test
```

Basic Shell Commands



systemctl

UNIT	LOAD	ACTIVE	SUB	DESCRIPTION
accounts-daemon.service	loaded	active	running	Accounts Service
acpid.service	loaded	active	running	ACPI event daemon
alsa-restore.service	loaded	active	exited	Save/Restore Sound Card State
apparmor.service	loaded	active	exited	Load AppArmor profiles
apport.service	loaded	active	exited	LSB: automatic crash report generati
avahi-daemon.service	loaded	active	running	Avahi mDNS/DNS-SD Stack
console-setup.service	loaded	active	exited	Set console font and keymap
cron.service	loaded	active	running	Regular background program processin
cups-browsed.service	loaded	active	running	Make remote CUPS printers available
cups.service	loaded	active	running	CUPS Scheduler
dbus.service	loaded	active	running	D-Bus System Message Bus
haveged.service	loaded	active	running	Entropy Daemon based on the HAVEGE a
kerneloops.service	loaded	active	running	Tool to automatically collect and su
keyboard-setup.service	loaded	active	exited	Set the console keyboard layout
kmod-static-nodes.service	loaded	active	exited	Create List of Static Device Nodes
ModemManager.service	loaded	active	running	Modem Manager
networkd-dispatcher.service	loaded	active	running	Dispatcher daemon for systemd-networ
NetworkManager-wait-online.service	loaded	active	exited	Network Manager Wait Online
NetworkManager.service	loaded	active	running	Network Manager
packagekit.service	loaded	active	running	PackageKit Daemon
plymouth-quit.service	loaded	active	exited	Terminate Plymouth Boot Screen
plymouth-read-write.service	loaded	active	exited	Tell Plymouth To Write Out Runtime D
plymouth-start.service	loaded	active	exited	Show Plymouth Boot Screen
polkit.service	loaded	active	running	Authorization Manager
power-profiles-daemon.service	loaded	active	running	Power Profiles daemon
rsyslog.service	loaded	active	running	System Logging Service
rtkit-daemon.service	loaded	active	running	RealtimeKit Scheduling Policy Servic
sddm.service	loaded	active	running	Simple Desktop Display Manager
setvtrgb.service	loaded	active	exited	Set console scheme
snapd.apparmor.service	loaded	active	exited	Load AppArmor profiles managed inter
snapd.seeded.service	loaded	active	exited	Wait until snapd is fully seeded
snapd.service	loaded	active	running	Snap Daemon
systemd-fsck@dev-disk-by\x2duuid-D0A6\x2d8697.service	loaded	active	exited	File System Check on /dev/disk/by-uu
systemd-journal-flush.service	loaded	active	exited	Flush Journal to Persistent Storage



Some Bash commands in Linux

```
dmesg
```

```
cat /proc/cpuinfo
```

```
free -h
```



Review

Kahoot!



Basic SHELL Commands





THANKS !