



Introduction to Unix

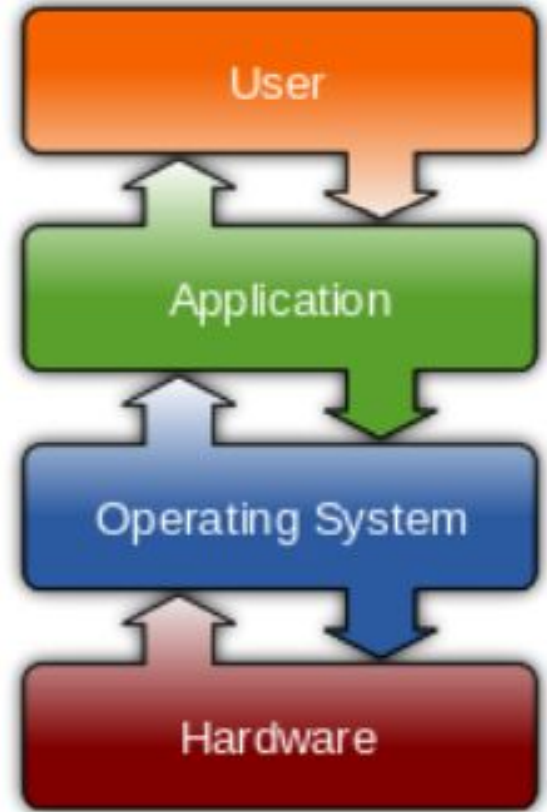
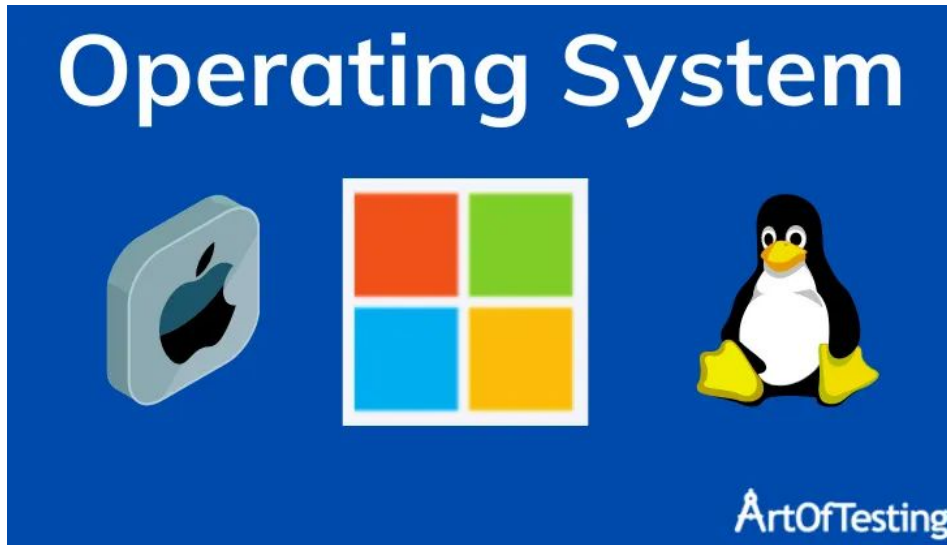
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Metodos Computacionales I

Physics Department, Universidad de los Andes, Bogotá



Operating system

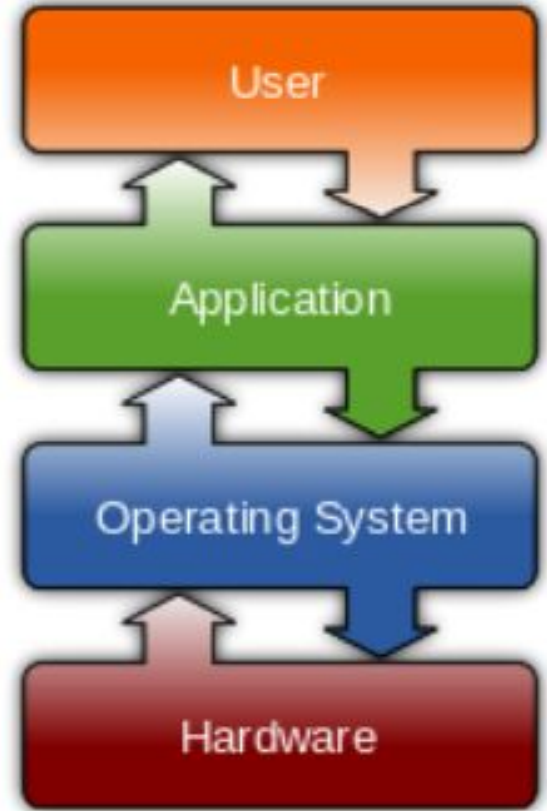


Operating system

Passes instructions from user to computer hardware and software

Manages RAM, Random access memory, CPU, central processing unit

Operating system tells the compiler to translate instructions to machine language.



Origins of Unix

1969



**General
Electric**

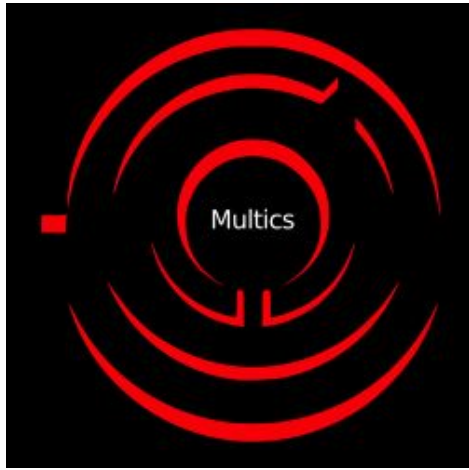


**Massachusetts
Institute of
Technology**

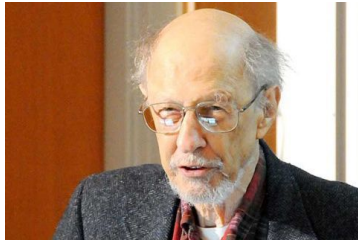


Bell Laboratories

Origins of Unix



Multiplexed Information and
Computing Service,
Fernando Corvato, MIT, 1960



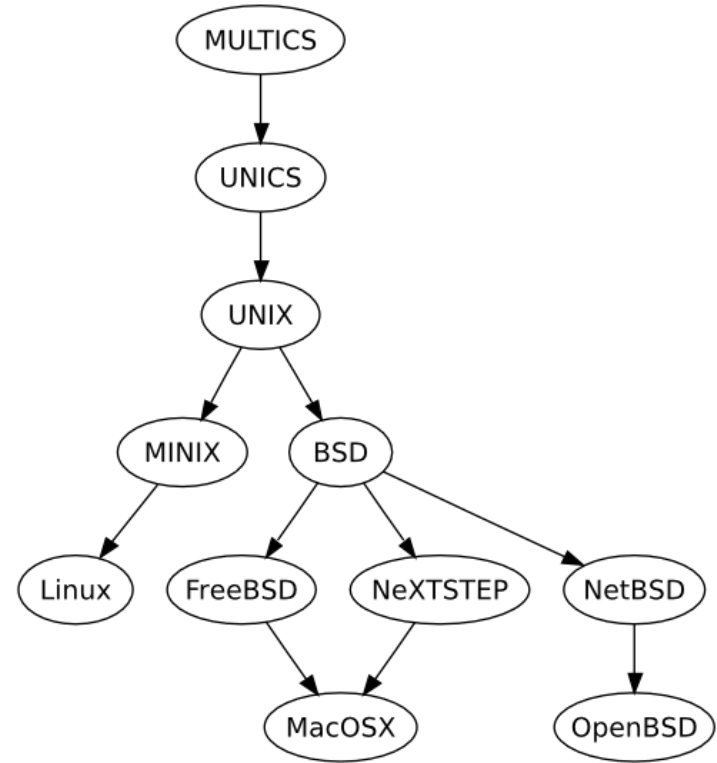
Uniplexed
Operating and
Computing System



1960, creators of C compiler

Images taken from <https://www.itbc.co.za/product/unix-administration-basics/>
<https://basketballjerseyarchive.com/es/bc-unics-kazan-2016-17-home-jersey/79180/>
<https://news.mit.edu/2019/mit-professor-emeritus-fernando-corby-corvato-computing-pioneer-dies-0715>

Unix family tree



Linux

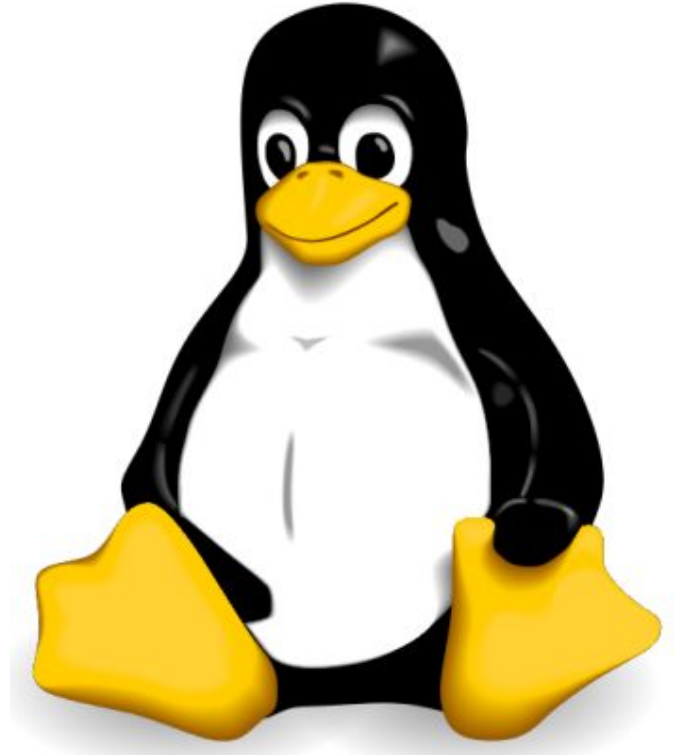
Linux Is Not Unix

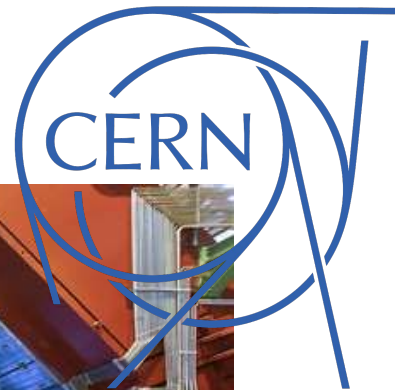
Recursive acronym

Based on MINIX

Linus Trovals - 1991






















Free software





Images taken from <https://x5servers.com/en/que-es-apache-web-serv>
<https://cs3mesh4eosc.eu/use-cases/cern-high-energy-physics>
<https://www.expansion.com/fueradeserie/cultura/2019/11/06/5db9a003468aeb017d8b46d1.html>

Linux Distros

Beginner-friendly	Intermediate	Hard mode
		
 Ubuntu Based on Debian	 Garuda Linux Based on Arch	 Arch [Independent] – DIY
 Pop!_OS Based on Ubuntu	 EndeavourOS Based on Arch	 Gentoo [Independent] – DIY
 elementary OS Based on Ubuntu (LTS)	 Manjaro Based on Arch	 Slackware [Independent]
 Mint Based on Ubuntu	 MX Linux Based on Debian	 Linux From Scratch [Independent] – DIY
 Zorin Based on Ubuntu	 Fedora Based on Red Hat	 Qubes OS Based on Fedora – Security
 Solus [Independent]	 OpenSUSE [Independent]	 NixOS [Independent] – DIY

Linux kernel with
various software
packages

Image taken from <https://www.reddit.com/media?url=https%3A%2F%2Fi.redd.it%2Fps4v1vipfyc71.png>

Introduction to Unix commands

Directory structure

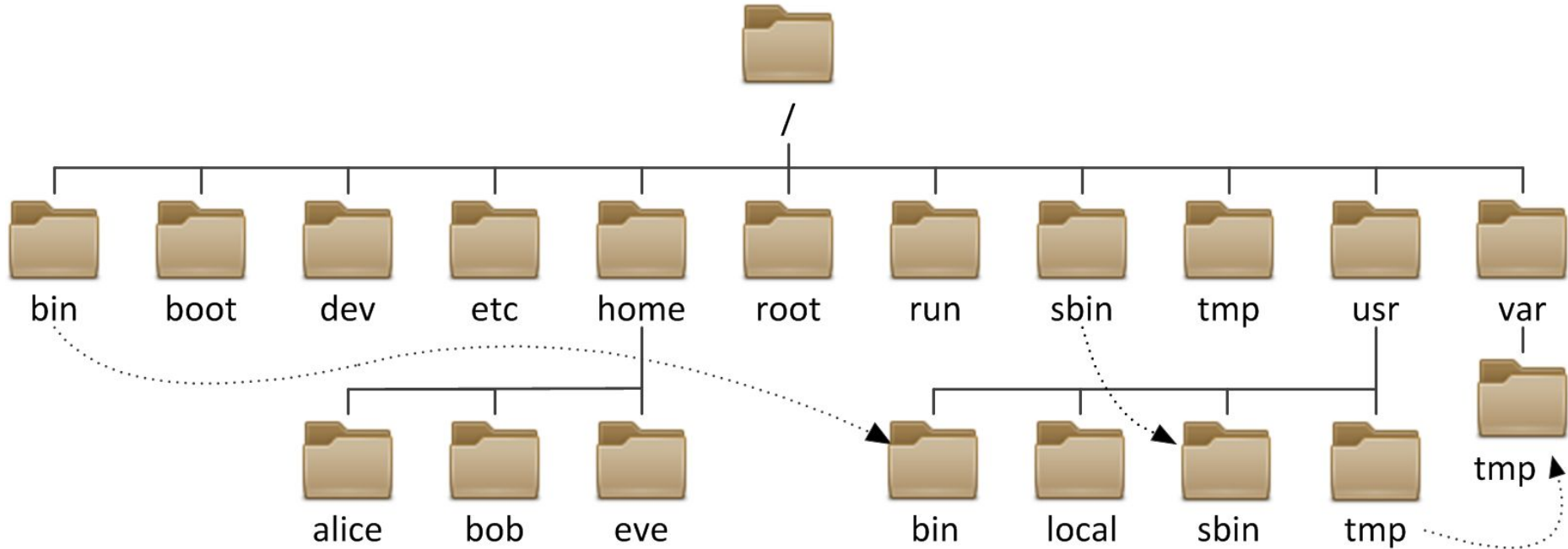
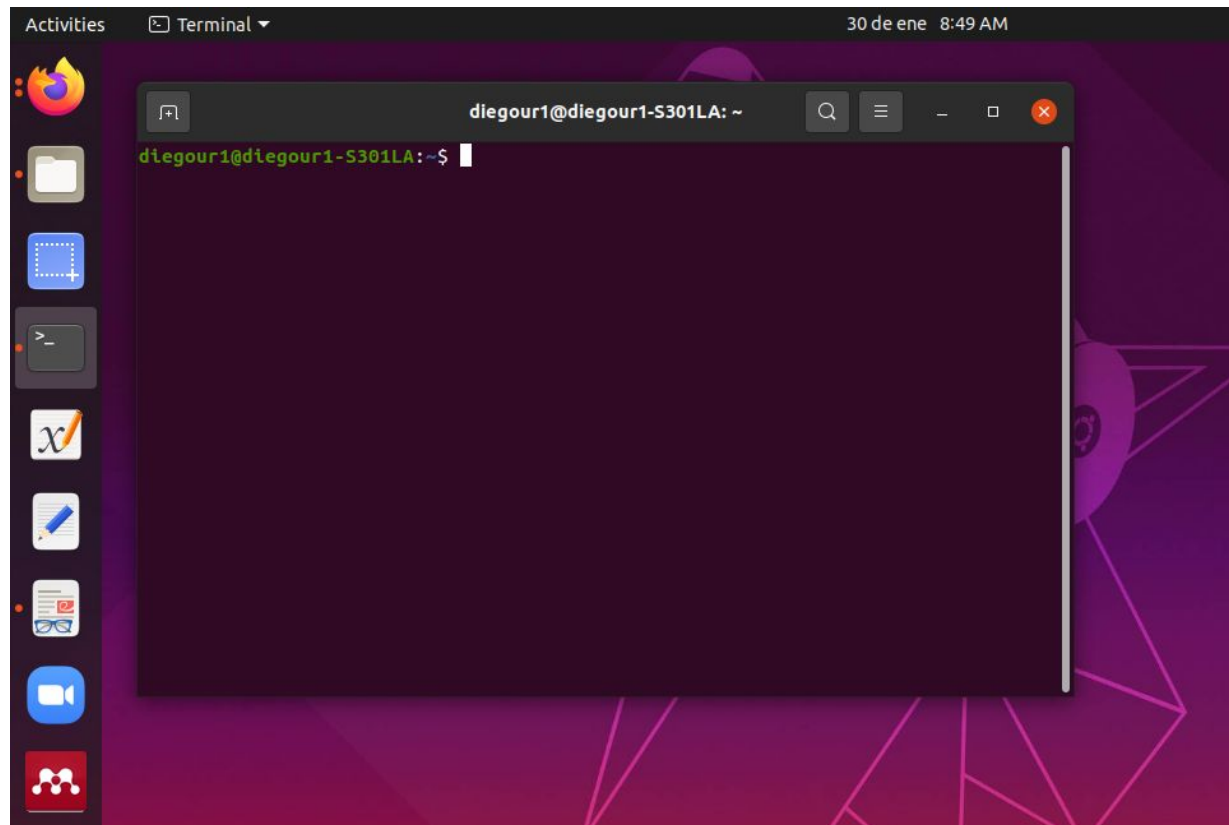


Image taken from https://www.serverkaka.com/2018/01/key-locations-in-linux-file-system_21.html

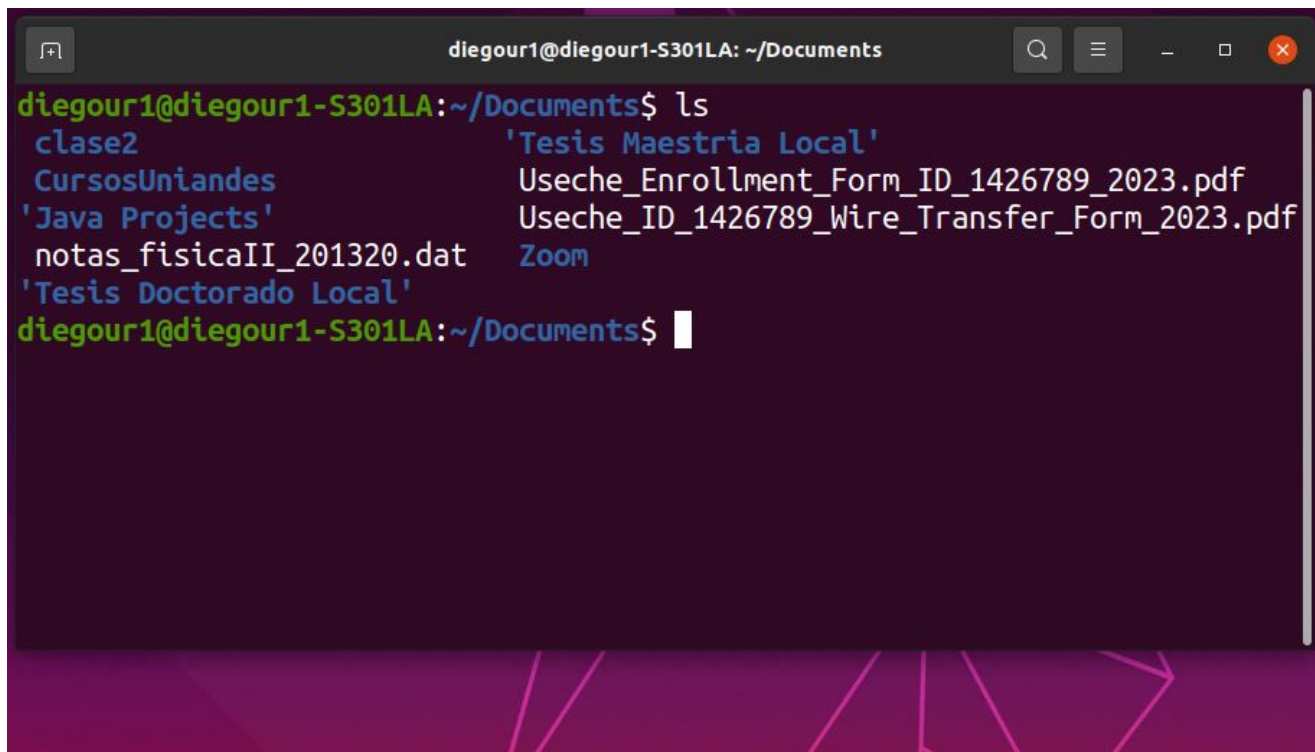
Terminal



Basic commands: ls

ls

list of the files
and folders
inside a folder



```
diegour1@diegour1-S301LA: ~/Documents
diegour1@diegour1-S301LA:~/Documents$ ls
clase2                                'Tesis Maestria Local'
CursosUniandes                       Useche_Enrollment_Form_ID_1426789_2023.pdf
'Java Projects'                     Useche_ID_1426789_Wire_Transfer_Form_2023.pdf
notas_fisicaII_201320.dat           Zoom
'Tesis Doctorado Local'
```

Basic commands: man

man

manual to
describe
commands

```
diegour1@diegour1-S301LA: ~/Documents
diegour1@diegour1-S301LA:~/Documents$ man ls
```

```
LS(1)                                User Commands                                LS(1)

NAME
    ls - list directory contents

SYNOPSIS
    ls [OPTION]... [FILE]...

DESCRIPTION
    List information about the FILES (the current directory by default). Sort entries alphabetically if none of -cftuvSUX nor --sort is specified.

    Mandatory arguments to long options are mandatory for short options.

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

Basic commands: cd (change directory)

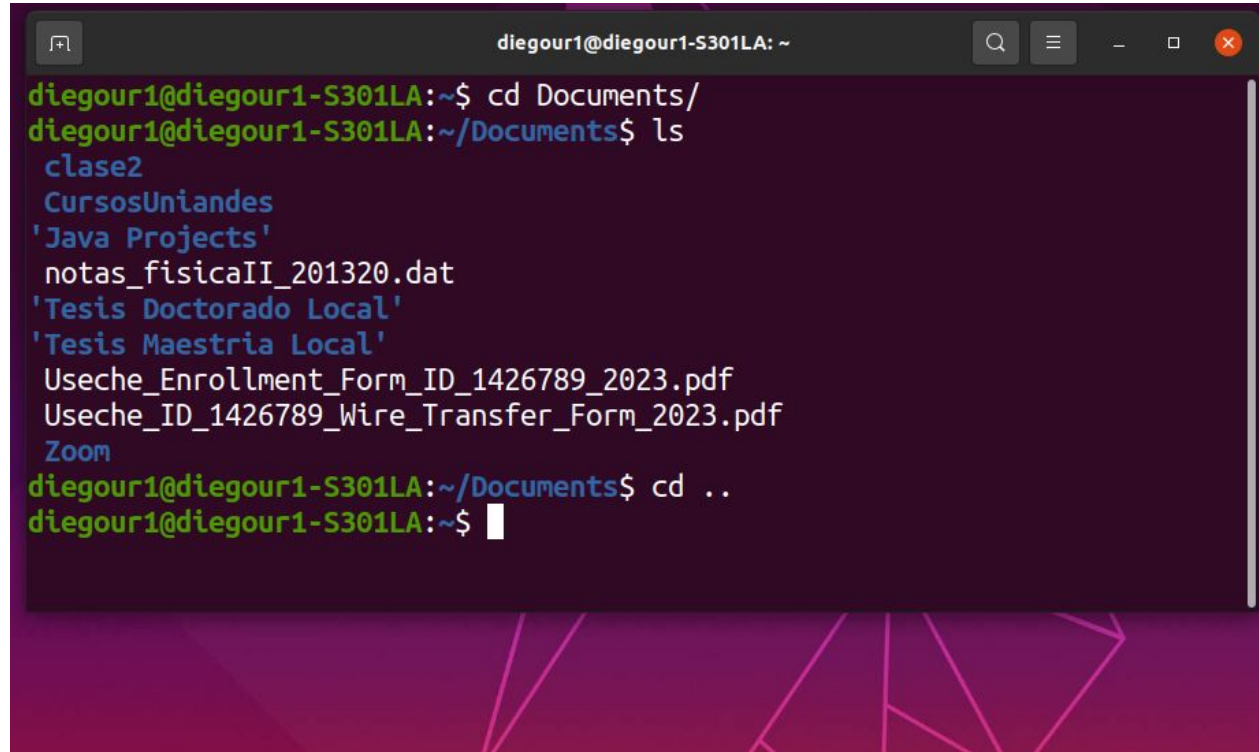
cd

cd Documents

move to
Documents folder

cd ..

move to previous
folder

A terminal window with a dark purple background and light green text. The window title is 'diegour1@diegour1-S301LA: ~'. The terminal shows the following commands and output:

```
diegour1@diegour1-S301LA:~$ cd Documents/  
diegour1@diegour1-S301LA:~/Documents$ ls  
clase2  
CursosUniandes  
'Java Projects'  
notas_fisicaII_201320.dat  
'Tesis Doctorado Local'  
'Tesis Maestria Local'  
Useche_Enrollment_Form_ID_1426789_2023.pdf  
Useche_ID_1426789_Wire_Transfer_Form_2023.pdf  
Zoom  
diegour1@diegour1-S301LA:~/Documents$ cd ..  
diegour1@diegour1-S301LA:~$
```


Basic commands

mkdir Documents

make directory - creates de folder Documents

pwd

print current path directory

clear

clean current terminal screen

Basic commands

cp ./exercise.py /Documents/Tasks

copy file between two paths ./ indicates current directory

mv exercise.py exercise_new.py

move change the name of the file

touch new_file.txt

create a new file from terminal

Danger zone

rm exercise.py

remove eliminate permanently a file

rm -r Documents

eliminate permanently a folder

-r is a **flag** (option of the command rm)

Basic commands: text commands

wc the_raven.txt

word count count number of words of a text file

wc -l the_raven.txt

count number of lines of a text file thanks to the flag -l

grep "Leonore" the_raven.txt

check in which lines appear the word "Leonore" in the_raven.txt

Basic commands: text commands

who

cp

cat

whoami

mv

head

cd

mkdir

tail

pwd

touch

ls

rm

wc

clear

wget

grep

man

Shell scripting

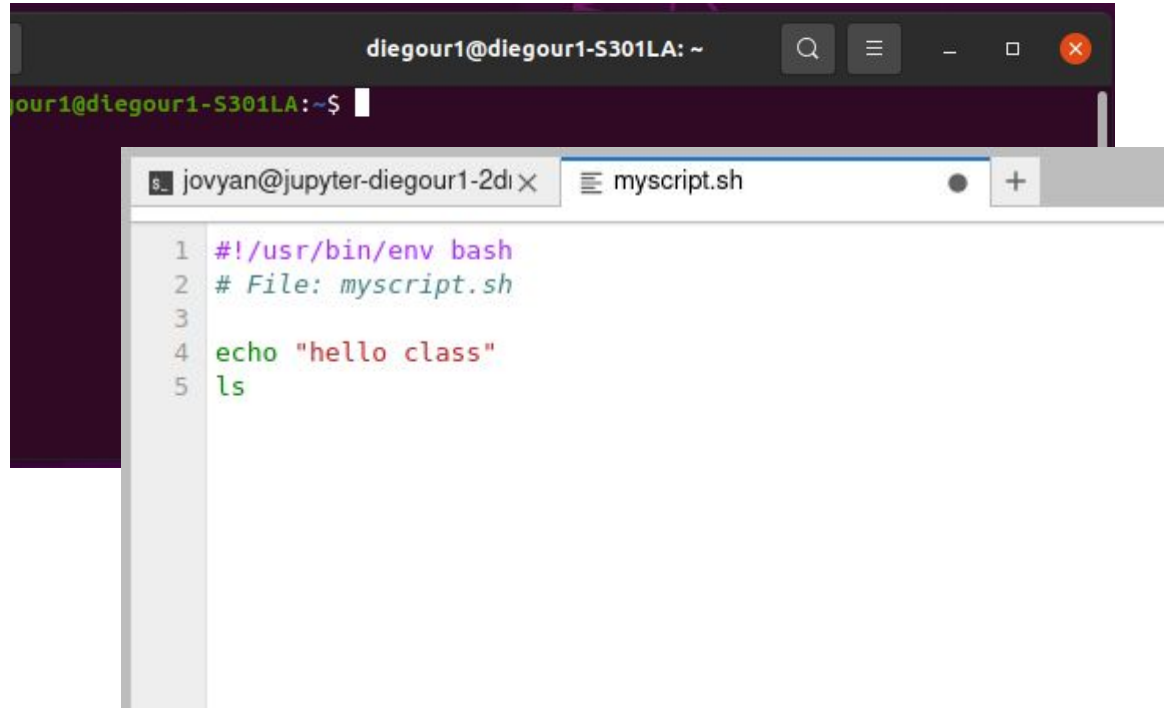
We can create a .sh file to perform various Linux commands

ls -l myscript.sh

list permission of file

chmod -x myscript.sh

some files are not executable **chmod -x** changes the permission of the file to be executable



The screenshot shows a terminal window with a dark background. The top bar indicates the user is 'diegour1' on a machine named 'diegour1-S301LA'. The terminal prompt is 'diegour1@diegour1-S301LA:~\$'. Below the terminal, a code editor window is open, showing the contents of a file named 'myscript.sh'. The file contains five lines of code: a shebang line, a comment, and two command lines.

```
1 #!/usr/bin/env bash
2 # File: myscript.sh
3
4 echo "hello class"
5 ls
```

References

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<https://www.usna.edu/Users/cs/wikman/IC221/calendar.php?type=class&event=1>

<https://www.reddit.com/media?url=https%3A%2F%2Fi.redd.it%2Fps4v1vipfyc71.png>

https://www.serverkaka.com/2018/01/key-locations-in-linux-file-system_21.html