



Introduction to Unix 2

Diego Useche - dh.useche@uniandes.edu.co

Metodos Computacionales I

Physics Department, Universidad de los Andes, Bogotá



Shell scripting

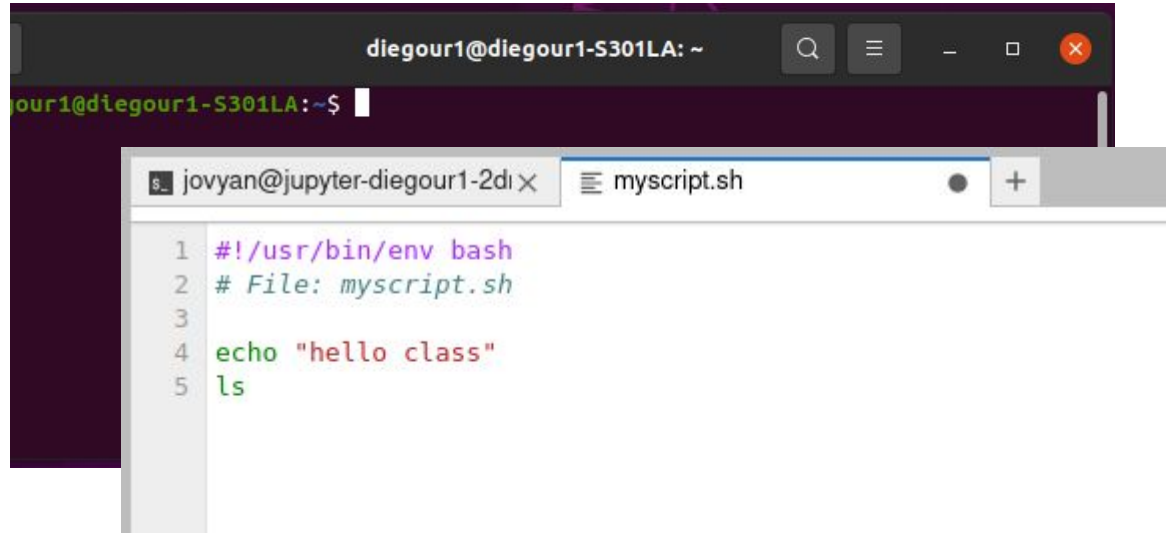
We can create a .sh file to perform various Linux commands, start with,

#!/usr/bin/env bash

to connect to bash

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

chmod +x myscript.sh



The screenshot shows a JupyterLab environment. At the top, a terminal window displays the prompt `diegour1@diegour1-S301LA: ~$`. Below it, a code editor window titled `myscript.sh` contains the following content:

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

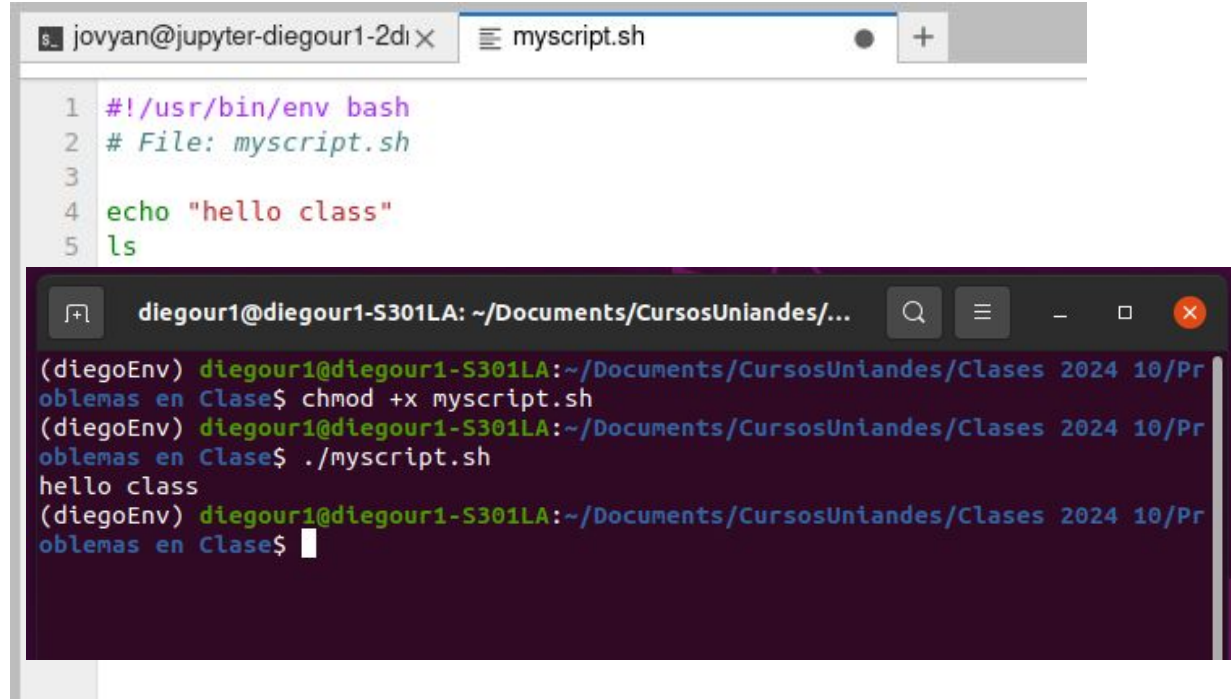
Compile the shell script

After changing the permission of the script

chmod +x myscript.sh

We compile the bash file with `./`

`./myscript.sh`



The image shows a Jupyter Notebook interface with a file named `myscript.sh` open. The script content is as follows:

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

Below the notebook, a terminal window is open, showing the execution of the script. The terminal output is:

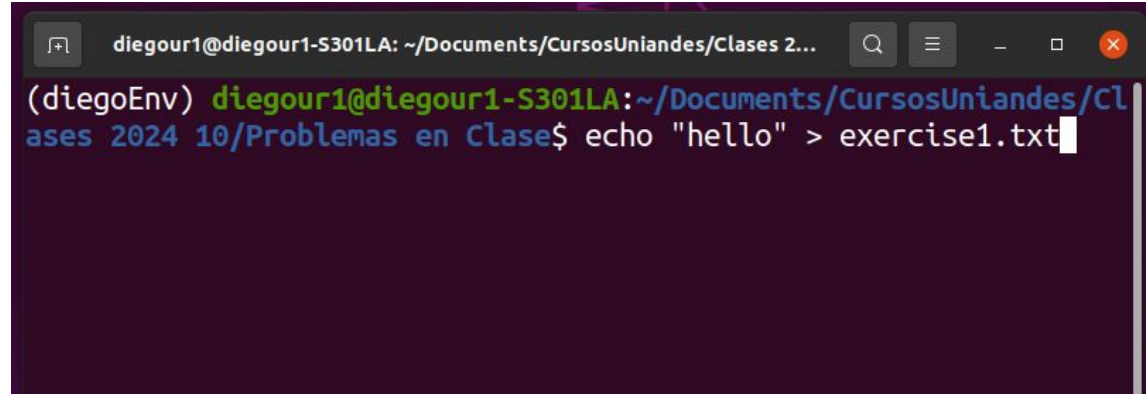
```
(diegoEnv) diegour1@diegour1-S301LA: ~/Documents/CursosUniandes/...
oblemas en Clase$ chmod +x myscript.sh
(diegoEnv) diegour1@diegour1-S301LA: ~/Documents/CursosUniandes/Clases 2024 10/Pr
oblemas en Clase$ ./myscript.sh
hello class
(diegoEnv) diegour1@diegour1-S301LA: ~/Documents/CursosUniandes/Clases 2024 10/Pr
oblemas en Clase$
```

Redirecting output

Use `>` to redirect output

`echo "hello" > exercise1.txt`

creates a txt file with "hello"



A terminal window with a dark background. The title bar shows the user 'diegour1' and the path '~/Documents/CursosUniandes/Clases 2...'. The prompt is '(diegoEnv) diegour1@diegour1-S301LA:~/Documents/CursosUniandes/Clases 2024 10/Problemas en Clase\$'. The command 'echo "hello" > exercise1.txt' is entered at the prompt, and the cursor is at the end of the line.

```
(diegoEnv) diegour1@diegour1-S301LA:~/Documents/CursosUniandes/Clases 2024 10/Problemas en Clase$ echo "hello" > exercise1.txt
```



A text editor window titled 'exercise1.txt' with a light yellow background. The file path is '~/Documents/CursosUniandes/...'. The content of the file is '1 hello'. The status bar at the bottom shows 'Plain Text', 'Tab Width: 8', 'Ln 1, Col 1', and 'INS'.

```
1 hello
```

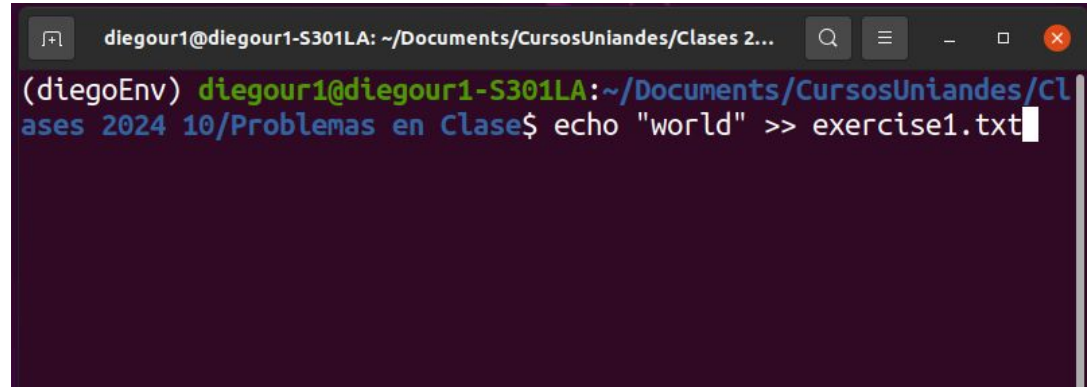
Redirecting output

Use `>>` to redirect output to the next line of .txt file

`echo "world" >> exercise1.txt`

write the next line of the txt file with "world"

if we used `>` this command would overwrite the .txt file



```
diegour1@diegour1-S301LA: ~/Documents/CursosUniandes/Clases 2...
(diegoEnv) diegour1@diegour1-S301LA:~/Documents/CursosUniandes/Clases 2024 10/Problemas en Clase$ echo "world" >> exercise1.txt
```



```
exercise1.txt
~/Documents/CursosUniandes/...
1 hello
2 world
```

Plain Text ▾ Tab Width: 8 ▾ Ln 1, Col 1 ▾ INS

Example

pipe

Structure

command 1 | command 2 | ... | command n | ...

Use the output of command 1 as the input of Command 2

pipe example

Recall

```
grep ".sh" file_list.txt
```

We may search for .sh files in a directory by

```
ls | grep ".sh"
```

The output of list is taken as the input of grep

pipe example

```
diegour1@diegour1-S301LA: ~/Documents/CursosUniandes/Clases 2024 10/Problemas en Clase$ ls
exercise1.txt      myscript.sh        states.txt
exercise_unix1.sh  notas_fisicaII_201320.dat
(diegour1@diegour1-S301LA:~/Documents/CursosUniandes/Clases 2024 10/Problemas en Clase$ ls | grep ".sh"
exercise_unix1.sh
myscript.sh
(diegour1@diegour1-S301LA:~/Documents/CursosUniandes/Clases 2024 10/Problemas en Clase$
```

pipe example

Recall

```
grep ".sh" file_list.txt
```

We may search for .sh files in a directory by

```
ls | grep ".sh"
```

The output of list is taken as the input of grep

Example

Other commands

sudo apt-get install emacs

use sudo to install new programs in linux

wget https://raw.githubusercontent.com/ComputoCienciasUnia/ndes/HerramientasComputacionalesDatos/master/Homework/hw1/01_notas.tsv

this command retrieves information from the web

awk example

After retrieving data from the web

```
wget https://raw.githubusercontent.com/ComputoCiencias  
Uniandes/HerramientasComputacionalesDatos/master/Hom  
ework/hw1/01_notas.tsv
```

We use awk to do operations of the text

```
awk '{if($4 >= 4.0) print $0}' 01_notas.tsv
```

\$4 indicates column 4 and \$0 indicates all columns of the file

awk example

```
jovyan@jupyter-diegour1-2dmetodoscomputacionales1-2dffmabu98:~$ awk '{if($4 >= 4.0) print $0}' 01_notas.tsv
```

| #Nombres | Apellidos | Carrera | P1 | P2 | P3 |
|-----------|-----------|---------|-----|-----|-----|
| Felipe | Gómez | BIOLOG | 4.3 | 2.1 | 3.0 |
| Diana | Cubillos | GEOFIS | 4.5 | 2.6 | 1.4 |
| Fabio | Lora | INGELE | 4.8 | 4.7 | 4.9 |
| José | Ishitsuka | INGCIV | 4.7 | 4.3 | 4.3 |
| Christian | Sarmiento | INGSIS | 5.0 | 4.8 | 4.8 |
| Mauricio | Suárez | INGMEC | 4.1 | 3.2 | 4.6 |
| Mario | Higuera | INGCIV | 4.7 | 3.2 | 1.9 |
| Farid | Char | INGELE | 4.3 | 2.7 | 1.4 |
| Oscar | Martínez | BIOLOG | 4.4 | 1.0 | 2.2 |
| Jonathan | Quirola | GEOFIS | 4.9 | 3.2 | 3.9 |
| Rigoberto | Casas | GEOFIS | 4.6 | 2.8 | 4.2 |
| Yesid | Molina | GEOFIS | 4.7 | 2.2 | 2.7 |
| Jair | Riaño | INGMEC | 4.7 | 2.9 | 2.4 |
| Guillermo | González | INGMEC | 4.9 | 3.3 | 2.6 |
| Juan | Buitrago | INGIND | 4.8 | 3.6 | 4.5 |
| Jorge | Garcia | BIOLOG | 4.6 | 3.8 | 4.4 |
| Mauricio | Vinasco | INGMEC | 4.8 | 3.4 | 4.0 |
| Lina | Benitez | MATEMA | 4.8 | 2.1 | 4.7 |
| Germán | Fajardo | FISICA | 4.2 | 1.9 | 1.7 |
| Julián | Corzo | INGIND | 4.4 | 4.1 | 3.2 |
| Christian | Moreno | INGIND | 4.2 | 3.6 | 2.8 |
| Oscar | Restrepo | INGCIV | 4.8 | 1.3 | 2.7 |
| William | Medina | GEOFIS | 4.4 | 3.9 | 1.1 |
| Lorena | Jiménez | FISICA | 4.5 | 1.2 | 2.8 |
| Ingrid | Blanco | INGMEC | 4.7 | 2.4 | 3.6 |

Example

Conditionals in bash

m = 4

n = 2

if [\$n -lt \$m]

then

echo "n is less than m"

fi

Loops in bash

```
for i in {1..20}  
  do  
    echo "number: $i"  
  done
```

Example

References

<https://www.redswitches.com/blog/if-else-in-shell-script/>

<https://www.freecodecamp.org/espanol/news/condicional-if-en-bash/>