Herramientas Computacionales para Ciencias
Homework 1

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The terminal (shell) we have been working on is a powerful tool to access to the services of a computer, to do so we have to learn some *instructions* or *commands*, such that `cd`, `cp`, `mv`, `ls`, `mkdir`, `rm`, etc.

On this first assignment you will have to use them to solve a series guided problems.

Rules

There is a part of the assignment must be done before the class, but the complete set of problems have to be uploaded to `sicuaplus`, maximum at the end of the 04/02 class, compressed on a file named with your name and surname plus `hw1` with no spaces, for example `MauricioSevillahw1.zip` (you can also use extension `.tar.gz`).

Useful lines

You can compress and extract files on the `shell`, this useful lines show you how to do this using the `zip`, and `tar.gz` format.

To compress a folder

```
zip -r archive_name.zip folder_to_compress
tar  -zcvf archive_name.tar.gz folder_to_compress
```

To extract a folder

```
unzip archive_name.zip
tar  -zxvf archive_name.tar.gz
```

Problem 1 (1.0/5.0)

The solution must be saved on `problem1.sh`

During the class, we have been working on files, how to create, edit, save, copy, move and rename them,

- **(0.25/1.0)** Create a file named as your UniAndes user and with extension `.txt` as we already did on class, for example, on my case it should be `j.sevillam.txt` containing your name. (It is better if you use `>` or `>>` instead of `nano`, `vim` or `emacs` so you can save every instruction on `problem.sh`)
- **(0.25/1.0)** Create a folder `data`.
- **(0.25/1.0)** Move the file inside the folder.
- **(0.25/1.0)** Add new information to the file just as we did on class: Name, code, age, career and semester. Such that, on my particular case the result should be,

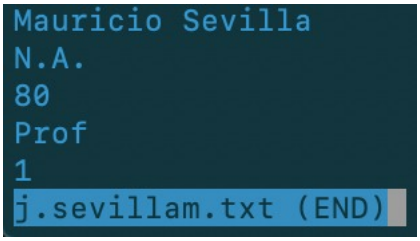

Figure 1: Screenshot of the file `j.sevillam.txt` opened with `more`

Note I used N.A. for the code because I don't have one!.

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Problem 2 (1.0/5.0)

The solution must be saved on `problem2.sh`

Uses of the pipeline `|`. This problem is way shorter than the previous one,

- **(0.2/1.0)** Download the file `DataHw1a.dat` by using `wget`,

```
wget github.com/jmsevillam/Herramientas-Computacionales-UniAndes/Data/DataHw1a.dat
```

- **(0.8/1.0)** This is a long file, by using the pipeline and the commands used in class, visualize the data and redirect to a new file `data2.dat` the line that includes your name, if it isn't (Because you didn't attend last class) use the line with my name.

Problem 3 (1.0/5.0)

The solution must be saved on `problem3.txt`

Explain with your own words the following commands

- **(0.1/1.0)** `cd`
- **(0.1/1.0)** `ls`
- **(0.1/1.0)** `mv`
- **(0.1/1.0)** `pwd`
- **(0.1/1.0)** `mkdir`
- **(0.1/1.0)** `rm`
- **(0.1/1.0)** `htop`
- **(0.1/1.0)** `more`
- **(0.1/1.0)** `less`

(0.1/1.0) And a brief explanation of what the `shell` is.

Problem 4 (1.0/5.0)

The solution must be saved on `problem4.sh`
Use of `grep`

- **(0.1/1.0)** Download the file `DataHw1b.zip` by using `wget`,

```
wget github.com/jmsevillam/Herramientas-Computacionales-UniAndes/Data/DataHw1b.zip
```

- **(0.1/1.0)** Use the help lines to unzip it. Once you unzip it, you will have a new folder, get into it.
- **(0.2/1.0)** Visualize the files, you can do it with `cat`, `more` or `less`, they all receive more than one file as a parameter, try using all at the same time

```
cat file1.txt file2.txt file3.txt
```

  Make a little description of what does it do compared with a single parameter file.

- **(0.2/1.0)** Using `grep`, find all the lines that include the word `the`, redirect it to a new file, and count the lines using `wc`.
- **(0.2/1.0)** Repeat the previous exercise, but using the flag `-i` on `grep`, Describe what the differences are.
- **(0.2/1.0)** Make a small description of the differences when you use the flag `-i` and `iw`

Problem 5 (1.0/5.0)

The solution must be saved on `problem5.sh`
Use of `awk`
All the following tasks have to be done using `awk`.

- **(0.2/1.0)** Print the file `file3.txt` downloaded on the previous problem using `awk`.
- **(0.2/1.0)** Print just the lines that coincide with the career `physics`.
- **(0.2/1.0)** Print only the columns of student and career.
- **(0.2/1.0)** Add labels to the table and print it.
- **(0.2/1.0)** Find how many people is older than 20 (you can use `akw`, pipelines and `wc`).