

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 `sicuplus`, 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

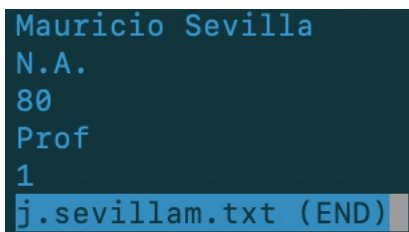
```
unzip archive_name.zip
tar -zxvf archive_name.tar.gz
```

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,



```
Mauricio Sevilla
N.A.
80
Prof
1
j.sevillam.txt (END)
```

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!

*email=j.sevillam@uniandes.edu.co

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 https://github.com/jmsevillam/Herramientas-Computacionales-UniAndes/raw/master/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) <code>cd</code> | • (0.1/1.0) <code>rm</code> |
| • (0.1/1.0) <code>ls</code> | • (0.1/1.0) <code>htop</code> |
| • (0.1/1.0) <code>mv</code> | • (0.1/1.0) <code>more</code> |
| • (0.1/1.0) <code>pwd</code> | • (0.1/1.0) <code>less</code> |
| • (0.1/1.0) <code>mkdir</code> | |

(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 https://github.com/jmsevillam/Herramientas-Computacionales-UniAndes/raw/master/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 `awk`, pipelines and `wc`).