

# *Andean Cosmology School*

## *Unix basics cookbook*

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June 2, 2015

## **1 The Terminal**

The terminal is the place in which you are going to interact with the computer.

### **1.1 Opening the terminal**

You can open the terminal by simply going to the ubuntu search button (usually located at the top left), type terminal and click on the terminal icon.

A faster way in Ubuntu is typing `Ctrl + Alt + t`.

### **1.2 Terminal commands**

#### **Directories:**

The first thing that you want to check is who is logged into the computer.

1. `whoami`

`whoami` print the username

2. `pwd`

`pwd` print the current/working directory

3. `ls`

`ls` list the directory contents

4. `cd Documents`

`cd` change the current directory and go inside the Documents directory

5. `cd ..`

`cd ..` go up in the directory

6. `mkdir escoan`

`mkdir` makes a new directory call `escoan`. `mkdir`

7. `cd escoan`

8. `mkdir hadsonRF`

make a new wrongly named directory `hadsonRF`

9. `rmdir hadsonRF`

remove the `hadsonRF` directory

10. `mkdir handson`

11. `cd handson`

12. `mkdir sesion1`

13. `cd sesion1`

## Downloading files:

Now download some data to play with.

14. `wget https://raw.githubusercontent.com/forero/AndeanCosmologySchool/master/hands-on/halocatalogue.tar.gz`

## Files:

15. `mkdir data`

16. `mv halocatalogue.tar.gz data/`

move `halocatalogue` to the `data` folder

17. `cd data`

18. `gunzip halocatalogue.tar.gz`

unzip the `halocatalogue.tar.gz` file

19. `tar -xvf halocatalogue.tar`

expands the file `halocatalogue.tar`

20. `cp Millenium13 ../`

copy the `Millenium13` file to `/sesion1`

21. `less Millenium13`

`less` shows the content of `Millenium13`

22. `q`

`q` exit from `Millenium13` file

23. `cat Millenium13`

Displays all the `Millenium13` content to stop press `Ctrl+c`

24. `head Millenium13`

Shows the first 10 lines of `Millenium13`, the `-l` flag allows to change the number of lines.

25. `tail Millenium13`

Shows the last 10 lines of `Millenium13`.

## Exploring files:

26. `wc Millenium13`

counts the number of lines, words, and bytes in `Millenium13`

27. `grep haloId Millenium13`

find the `haloId` word in `Millenium13` and print the line in which it appears.

28. `awk '{print $1}' Millenium13 > col1.txt`

print the first column of the `Millenium13` file and redirects the output to `col1.txt`

29. `awk '{print $18+$19}' Millenium13 > xy.txt`

30. `awk '{if ($19>100) print $0}'`

print all lines in which column 19 is greater than 100.

31. `sed 's/haloId/haloID/g' Millenium13 > newID`

changes `haloId` for `haloID` and redirects the output to `newID`

## Useful commands

`history`

`Ctrl + r`

`man`

`Tab`

## Scripts and text editors

To open an emacs file:

```
emacs halomc.sh &
```

The `&` would open an external window without freezing the terminal.

### Exercise:

Write a script that makes the following:

1. Select dark matter halos with masses below `m_crit200 < 5` from the `halocatalog.txt`.

Write the `id, x, y, z, m_crit200, vMax` columns for this halos in a separate file called `haloslowmass.txt`.

2. Repeat step 1 for `m_crit200 > 10`, the new file should be called `haloshighmass.txt`.

3. Change the `.txt` files to `.csv` files.

Cut text:

`Ctrl+w`

Copy text:

`M+w`

Paste text:

Ctrl+y

Save:

Ctrl+x+s

Exit Emacs:

Ctrl+x+c

EMACS OFFICIAL WEB SITE:

<https://www.gnu.org/software/emacs/>

USEFULL MANUAL AND TUTORIALS

[https://www.gnu.org/software/emacs/manual/html\\_node/emacs/index.html](https://www.gnu.org/software/emacs/manual/html_node/emacs/index.html)

<http://www.drpaulcarter.com/cs/emacs.php>

### 1.3 Making a script executable

chmod u+x script.sh [chmod changes the file mode of the .sh file](#)

### 1.4 Running a script

./script.sh