Tutorial 1: Unix Command Line (I)

CS 104

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Topics

- Basic Commands
- Exercises

Basic commands

Basic commands

pwd : present working directory

ls : list directory contents

mkdir : make new directory

cd : change directory

mv : move

cp : copy

rm : remove

rmdir : remove directory

man : manual documentation page

cat : concatenate

clear : clear the terminal screen

echo : display the text passed in as an argument

head : display first lines of a file

tail : display the last part of a file

Clear

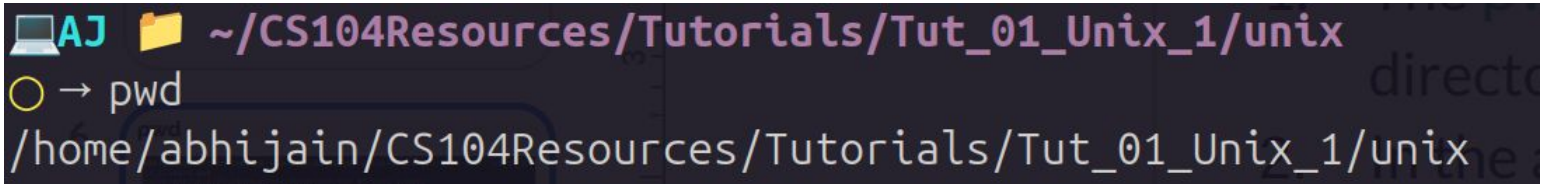
1. This command simply clears out the terminal screen, **nothing else** is changed.

Man

1. A useful tool for viewing detailed documentation, options, and usage guidelines for various commands.
2. Usage: man <command>

Exercise: What will man man do?

pwd



1. The pwd command prints the full name (the full path) of current/working directory.
2. In the above example, current working directory is

   `/home/abhijain/CS104Resources/Tutorials/Tut_01_Unix_1/unix`

   This will be our working directory for this tutorial :)

ls

```
AJ 📁 ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
○ → ls
code  file-analysis  joke1  joke2  joke3  photos  test
```

1. The ls command is used to display a listing of files and directories.
2. If no arguments are given, then provides the list of files and directories in the current location.
3. If argument is given, then provides the list of files and directories within the specified path.
4. Additionally, various options can be used with ls to modify the output or gather more detailed information about the files and directories.
   For example:
   -a : lists hidden files/directories as well
   -l : list files in the long format
5. **Exercise:** using man, see what -1, -R options are used for.

```
AJ 📁 ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
○ → ls -la
total 36
drwxrwxr-x 6 abhijain abhijain 4096 Jan 13 13:04 .
drwxrwxr-x 3 abhijain abhijain 4096 Jan 13 11:10 ..
drwxr-xr-x 2 abhijain abhijain 4096 Nov 21 10:10 code
drwxrwxr-x 5 abhijain abhijain 4096 Jan 10 13:50 file-analysis
```

mkdir, cd

- The mkdir command is used to make a new directory.
- The cd command is used to change directory.
- In the example,
  - First we made a new directory called test.
  - Then, we changed our directory to test.
  - Finally we came back to our tutorial_1 directory.
    Note: We used '..' to move into parent directory

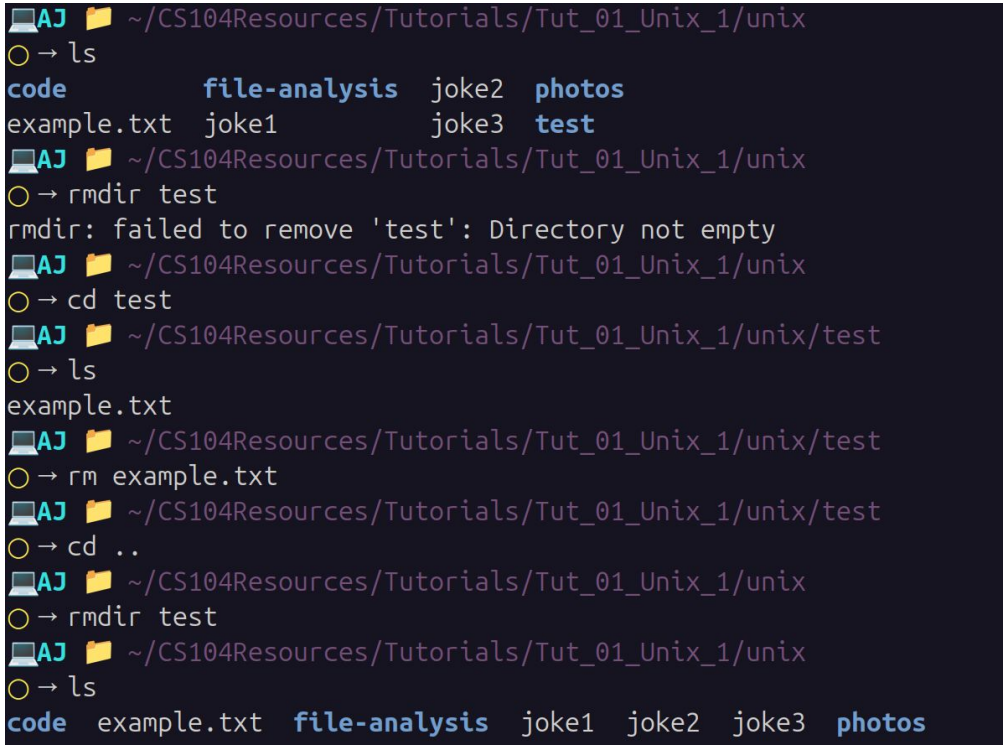
```
AJ ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
→ ls
code  file-analysis  joke1  joke2  joke3  photos
AJ ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
→ mkdir test
AJ ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
→ ls
code  file-analysis  joke1  joke2  joke3  photos  test
AJ ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
→ cd test
AJ ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix/test
→ ls
AJ ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix/test
→ ls -la
total 8
drwxrwxr-x 2 abhijain abhijain 4096 Jan 13 13:04 .
drwxrwxr-x 6 abhijain abhijain 4096 Jan 13 13:04 ..
AJ ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix/test
→ cd ..
AJ ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
→ ls
code  file-analysis  joke1  joke2  joke3  photos  test
```

mv, cp

- The mv command is used to move files/folders. It can also be used for renaming files/folders.
- The cp command is used to copy files.
- In the example,
  - First we moved example.txt file into test.
  - Then, we copied example.txt file from test to ex.txt in the parent directory.
  - Then, we renamed ex.txt to example.txt.

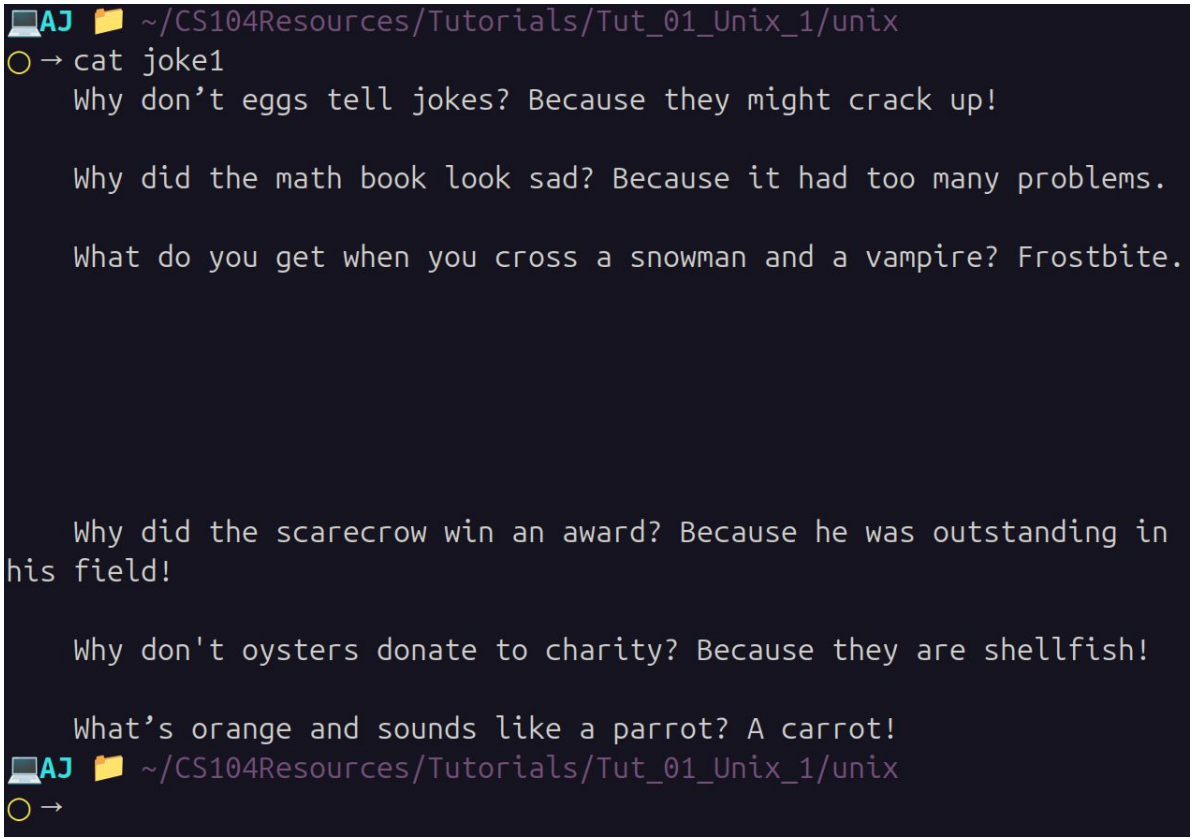
rm, rmdir

- The rm command is used to remove files. See -d, -r option.
- The rmdir command is used to remove directories. *(Note that directory should be empty)*
- In the example,
  - We tried to remove test, but failed because mails was not empty.
  - So, first we removed example.txt from mails
  - Finally, we removed test.



cat

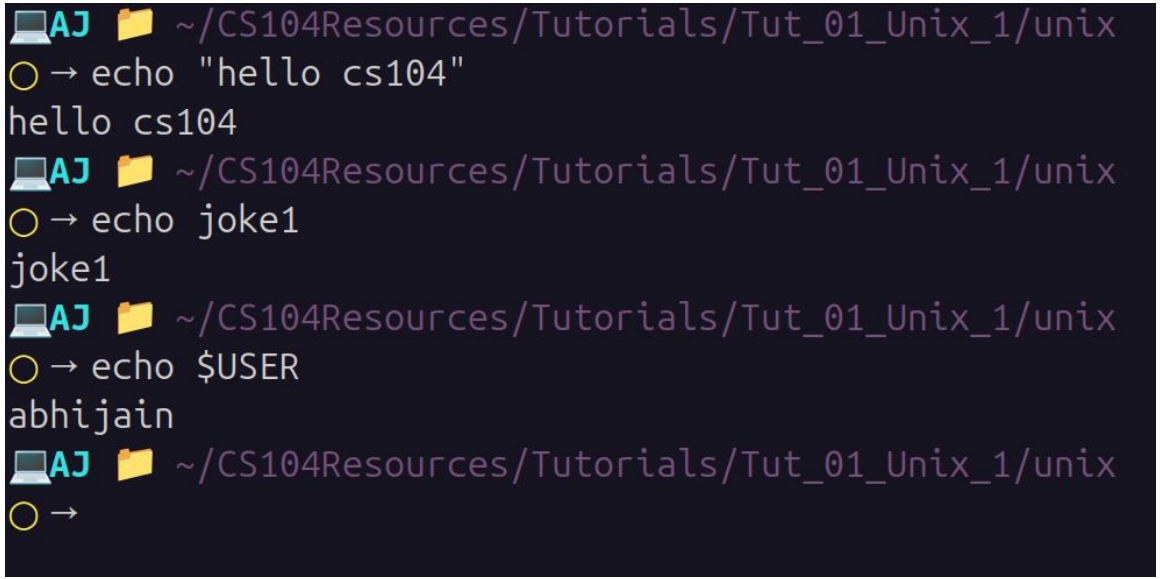
- The cat command is used to read data from a file and give its contents as output
- In the example, we used cat to print the contents of joke1 file to terminal.



echo

- The echo command outputs whatever is given to it as argument.
- In the example, we used echo to print hello cs104 to terminal.

Exercise: Try echo $USER (Just for fun! Detailed explanation later through the course)



head

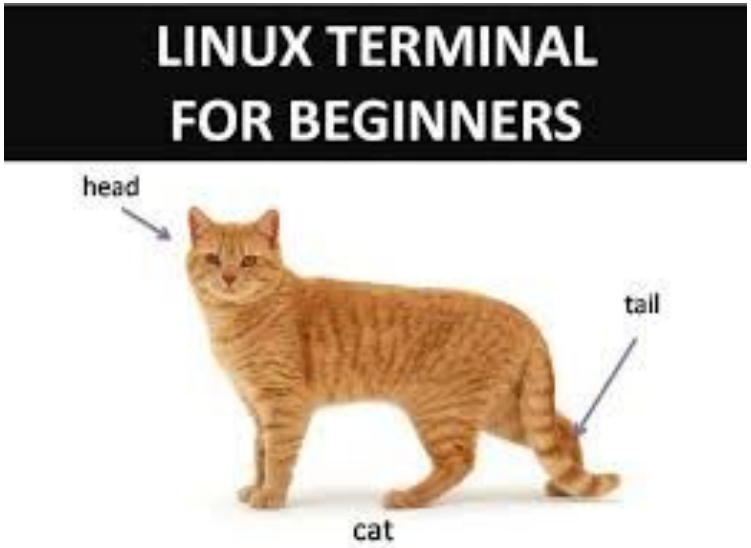
- The head command is used to display first few data of a given input. By default, it prints the first 10 lines of the specified files.
- In the example, we used head to print first 3 lines of joke3 file to terminal.
- Checkout options: -c

```
AJ 📁 ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
○ → cat -n joke3
     1
     2
     3      Why can’t a nose be 12 inches long? Because then it would be a foot!
     4
     5      What did the grape do when it got stepped on? Nothing, it just let out a little
wine.
     6
     7      What do you call a dinosaur with an extensive vocabulary? A thesaurus!
     8
     9      Why don’t scientists trust atoms? Because they make up everything!
AJ 📁 ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
○ → head -n 3 joke3


   Why can’t a nose be 12 inches long? Because then it would be a foot!
```

- Cat with -n option prints line numbers

tail

- The tail command is used to display last few data of a given input. By default, it prints the last 10 lines of the specified files.
- Similar to what head does
- Checkout options: -v



Other commands

There are various other commands that we will see as we progress through the course

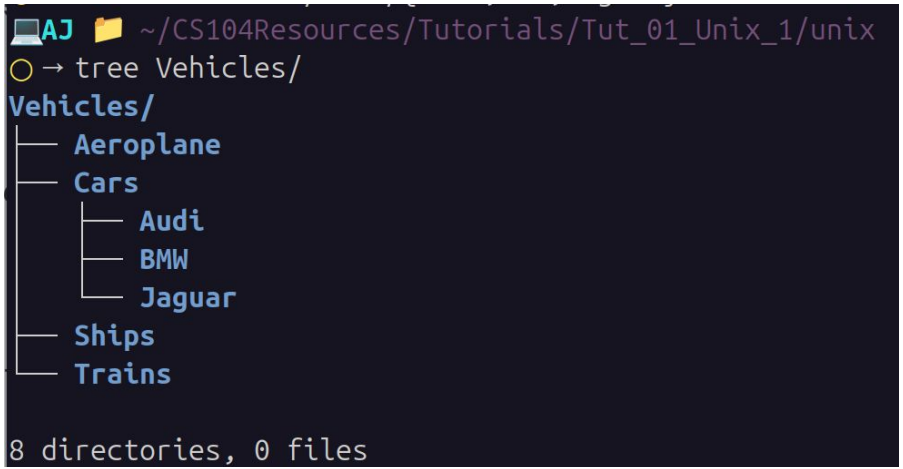
- ps
- chmod
- tar
- grep
- cut
- wc
- less
- and many more …

Exercises

Exercise 1

Create a new directory named Vehicles with the following directory structure, note that there are no files present yet.

```
Vehicles
├── Aeroplanes
├── Cars
│   ├── Audi
│   ├── BMW
│   └── Jaguar
├── Ships
└── Trains
```



Solution 1

1. One solution is to create all directories one by one. (Brute Force)
2. An alternative is to generate multiple directories simultaneously, rather than individually creating each one separately.

Notice the use of {}.

3. The -p option

```
AJ ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
→ rm -R Vehicles/
AJ ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
→ mkdir Vehicles
AJ ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
→ mkdir Vehicles/{Cars,Ships,Trains,Aeroplane}
AJ ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
→ mkdir Vehicles/Cars/{Audi,BMW,Jaguar}
```

METHOD - 2

```
AJ ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
→ mkdir -p Vehicles/{Cars/{Audi,BMW,Jaguar},Trains,Aeroplane,Ships}
AJ ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
→ ls -R Vehicles
Vehicles:
Aeroplane  Cars  Ships  Trains

Vehicles/Aeroplane:

Vehicles/Cars:
Audi  BMW  Jaguar

Vehicles/Cars/Audi:

Vehicles/Cars/BMW:

Vehicles/Cars/Jaguar:

Vehicles/Ships:

Vehicles/Trains:
```

METHOD - 3

Exercise 2

From the file-analysis/demo/code directory move the file hello.c in file-analysis/dir1 directory, help him move the code file to the right location.

Note: The file-analysis directory is in the main directory provided.

Solution 2

1. Now it's a simple application of mv command, we move the file according to the path provided.

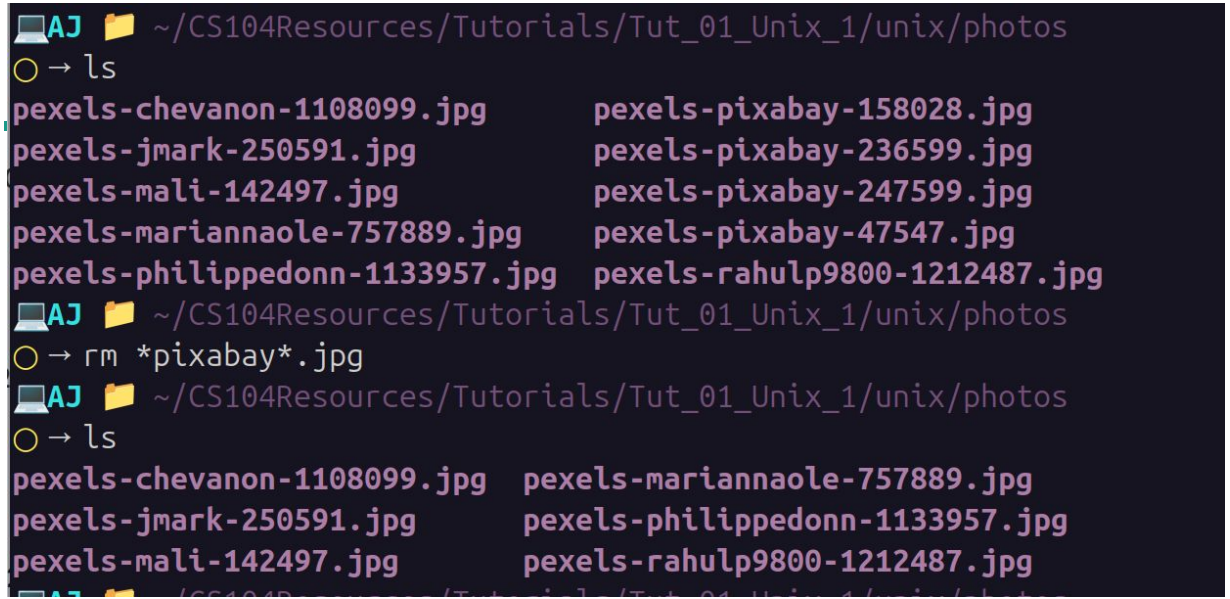
```
💻AJ 📁 ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
◯ → mv file-analysis/demo/code/hello.c file-analysis/dir1/
```

```
💻AJ 📁 ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
◯ → ls -R file-analysis/
file-analysis/:
bigfile      demo  fruits1  fun_dir  HELLO.c  list1    smallfile
commands.sh  dir1  fruits2  hello.c  list     oddball  students.csv

file-analysis/demo:
code  doc

file-analysis/demo/code:
hello

file-analysis/demo/doc:

file-analysis/dir1:
file1  file2  file3  hello.c
```

Exercise 3

In the **photos** directory remove all jpg files that contains pixabay in the name.

Solution 3



1. First we change directory to Photos folder using the cd command. (This step was not necessary but for the sake of demonstration let's do it)
2. Now we will use rm command using wildcard *pixabay*.jpg that will remove all .jpg files containing pixabay.

Exercise 4

There's a **students.csv** in the file-analysis directory containing the list of students who have registered for this course. Find the last 3 entries from the file.

Solution 4

```
💻AJ 📁 ~/CS104Resources/Tutorials/Tut_01_Unix_1/unix
○ → tail -n 3 file-analysis/students.csv
217,24B1099,Arnav Baranwal,0,Credit,Approved,Active,H16
218,24B1100,Niyam Shyam Kotian,0,Credit,Approved,Active,H1
219,24B1101,Ganipisetty Mahaswi,0,Credit,Approved,Active,H16
```

There are 2 ways to do it

1. If you are too free then maybe use the cat command and get to the end of the file.
2. If you have attended this tutorial attentively, then we covered a command whose functionality is exactly what is asked for, yes it's the tail command.

Thinking time: What if the question was to get the lines numbered 20510-20520 in a file with 50000 lines, how will you find those lines using head and tail? We will cover this in the next tutorial.

Thank You !!!