Tutorial 1: Unix Command Line (I)

CS 108

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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

pwd

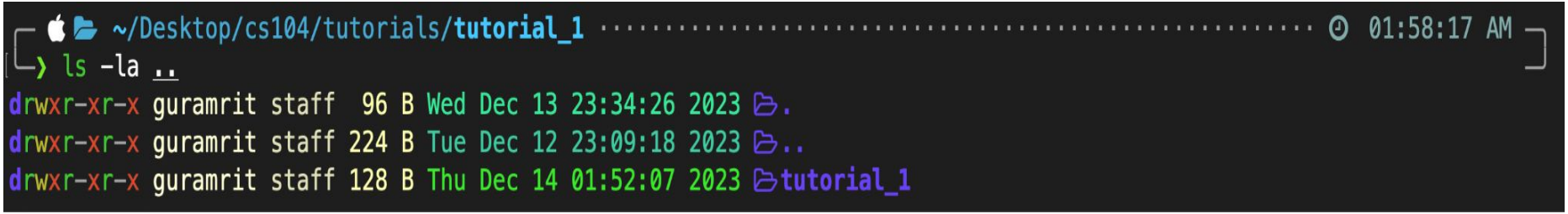
1. The pwd command prints the full name (the full path) of current/working directory.
2. In the above example, current working directory is

   `/Users/guramrit/Desktop/cs104/tutorials/tutorial_1`

   This will be our working directory for this tutorial :)

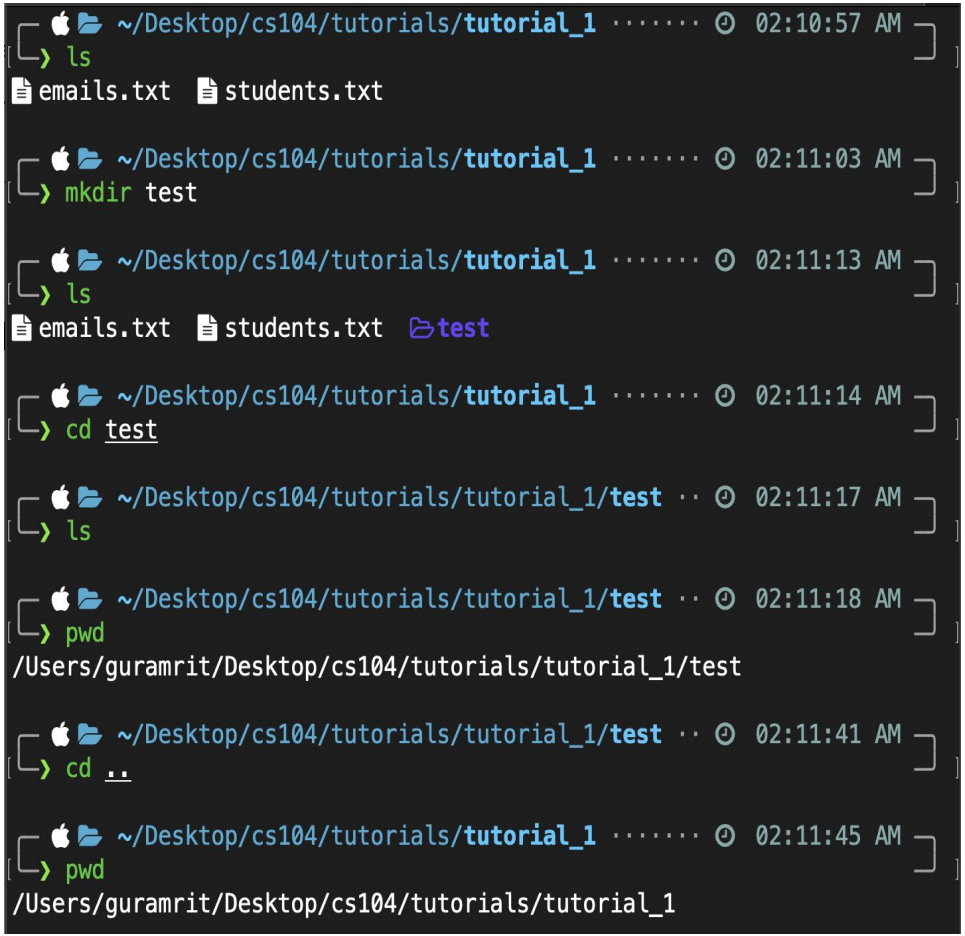
ls

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.



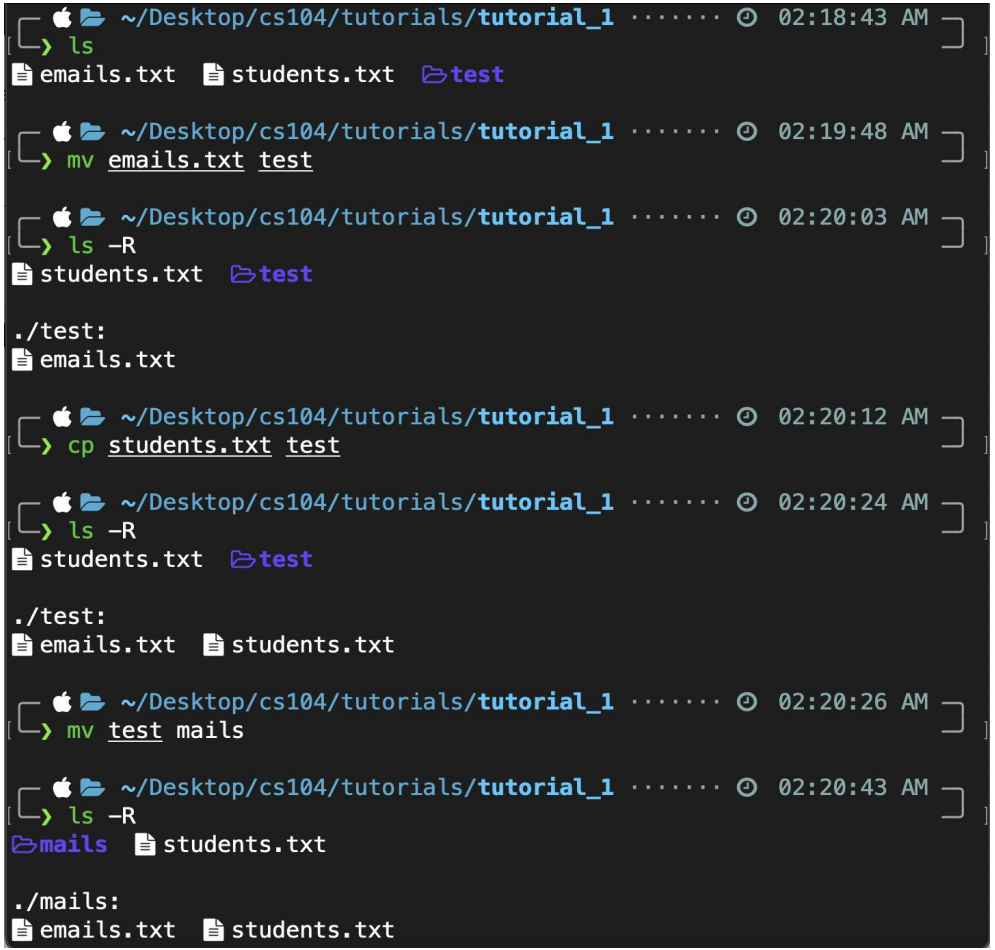
mkdir, cd

- 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



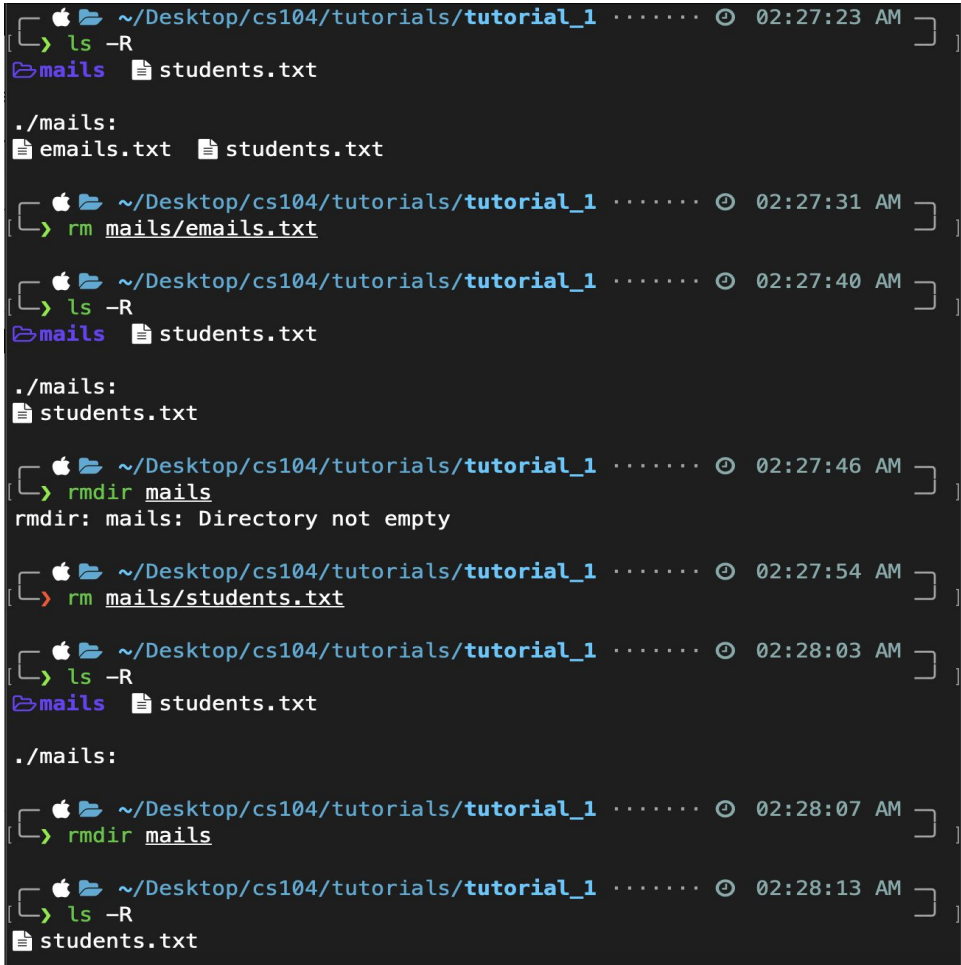
mv, cp

- 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 emails.txt file into test.
  - Then, we copied students.txt file into test.
  - Then, we renamed test to mails.



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,
  - First we removed emails.txt file from mails.
  - Then, we tried to remove mails, but failed because mails was not empty.
  - So we removed students.txt file from mails.
  - Finally, we removed mails.

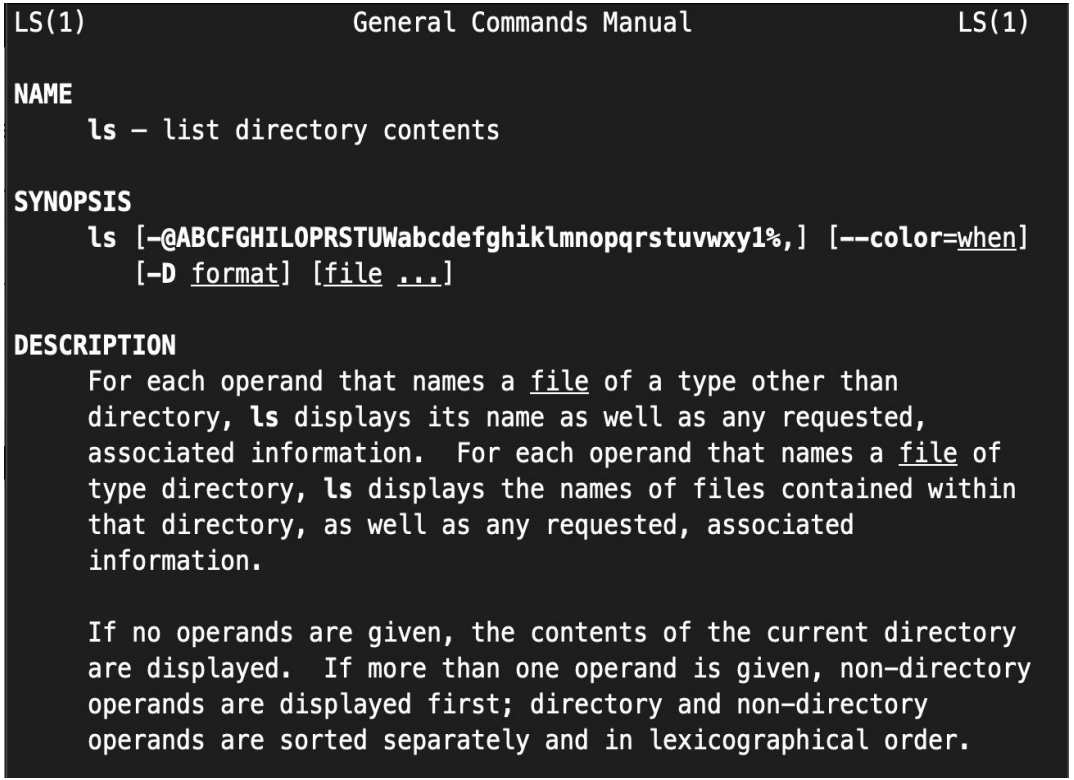


man

```
~/Desktop/cs104/tutorials/tutorial_1 ····· 02:43:50 AM
❯ man ls
```

The man command is used to display documentation pages. In this example, we used the command man ls to get the manual page for ls.

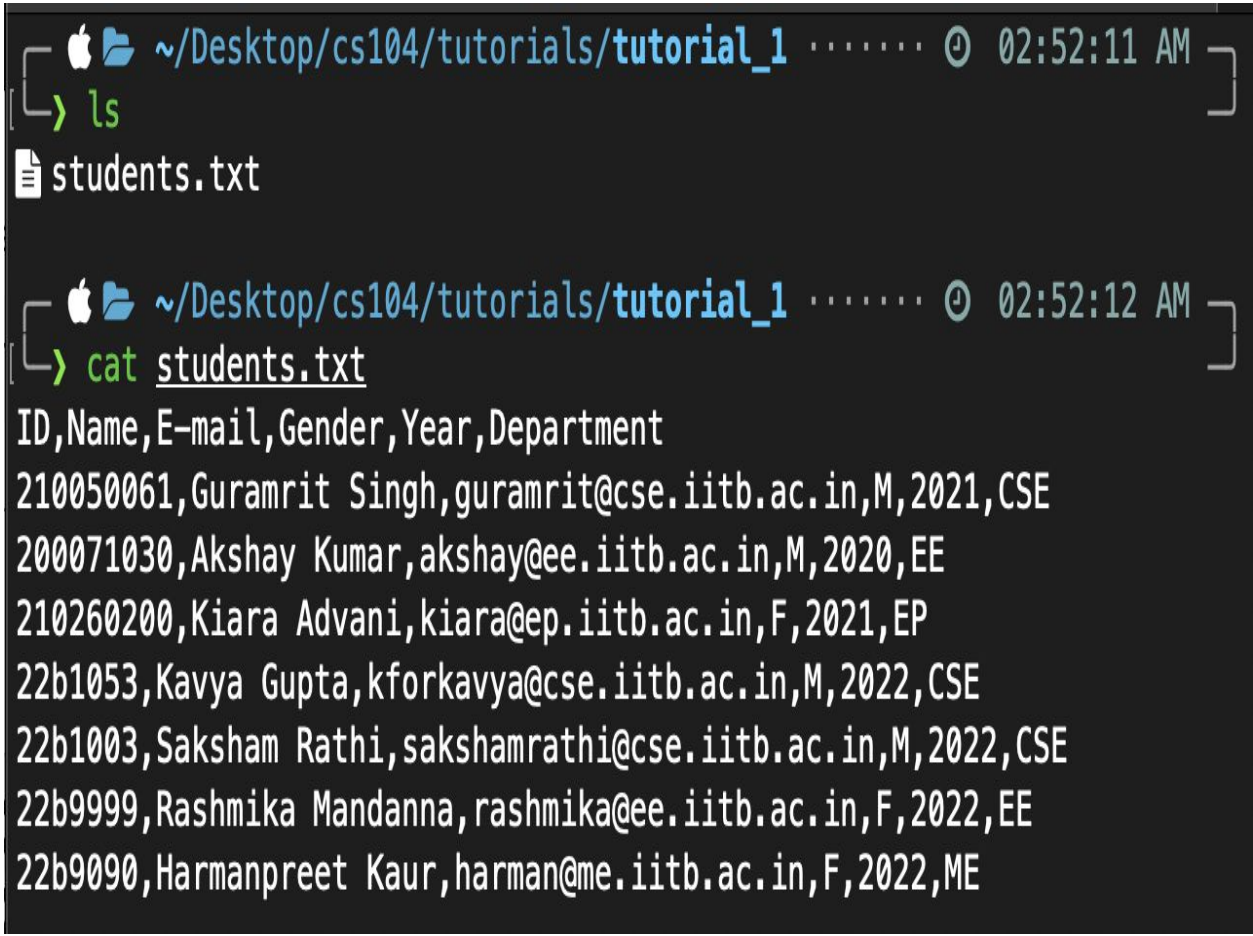
Exercise: *Try "man man" :)*



```
LS(1)                    General Commands Manual                    LS(1)

NAME
     ls – list directory contents

SYNOPSIS
     ls [-@ABCFGHILOPRSTUWabcdefghiklmnopqrstuvwxy1%,] [--color=when]
        [-D format] [file ...]

DESCRIPTION
     For each operand that names a file of a type other than
     directory, ls displays its name as well as any requested,
     associated information.  For each operand that names a file of
     type directory, ls displays the names of files contained within
     that directory, as well as any requested, associated
     information.

     If no operands are given, the contents of the current directory
     are displayed.  If more than one operand is given, non-directory
     operands are displayed first; directory and non-directory
     operands are sorted separately and in lexicographical order.
```

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 students.txt file to terminal.



clear

```
~/Desktop/cs104/tutorials/tutorial_1 ····· 02:52:11 AM
❯ ls
students.txt

~/Desktop/cs104/tutorials/tutorial_1 ····· 02:52:12 AM
❯ cat students.txt
ID,Name,E-mail,Gender,Year,Department
210050061,Guramrit Singh,guramrit@cse.iitb.ac.in,M,2021,CSE
200071030,Akshay Kumar,akshay@ee.iitb.ac.in,M,2020,EE
210260200,Kiara Advani,kiara@ep.iitb.ac.in,F,2021,EP
22b1053,Kavya Gupta,kforkavya@cse.iitb.ac.in,M,2022,CSE
22b1003,Saksham Rathi,sakshamrathi@cse.iitb.ac.in,M,2022,CSE
22b9999,Rashmika Mandanna,rashmika@ee.iitb.ac.in,F,2022,EE
22b9090,Harmanpreet Kaur,harman@me.iitb.ac.in,F,2022,ME

~/Desktop/cs104/tutorials/tutorial_1 ····· 02:52:15 AM
❯ clear
```

Before clear

```
~/Desktop/cs104/tutorials/tutorial_1 ····· 02:53:49 AM
❯
```

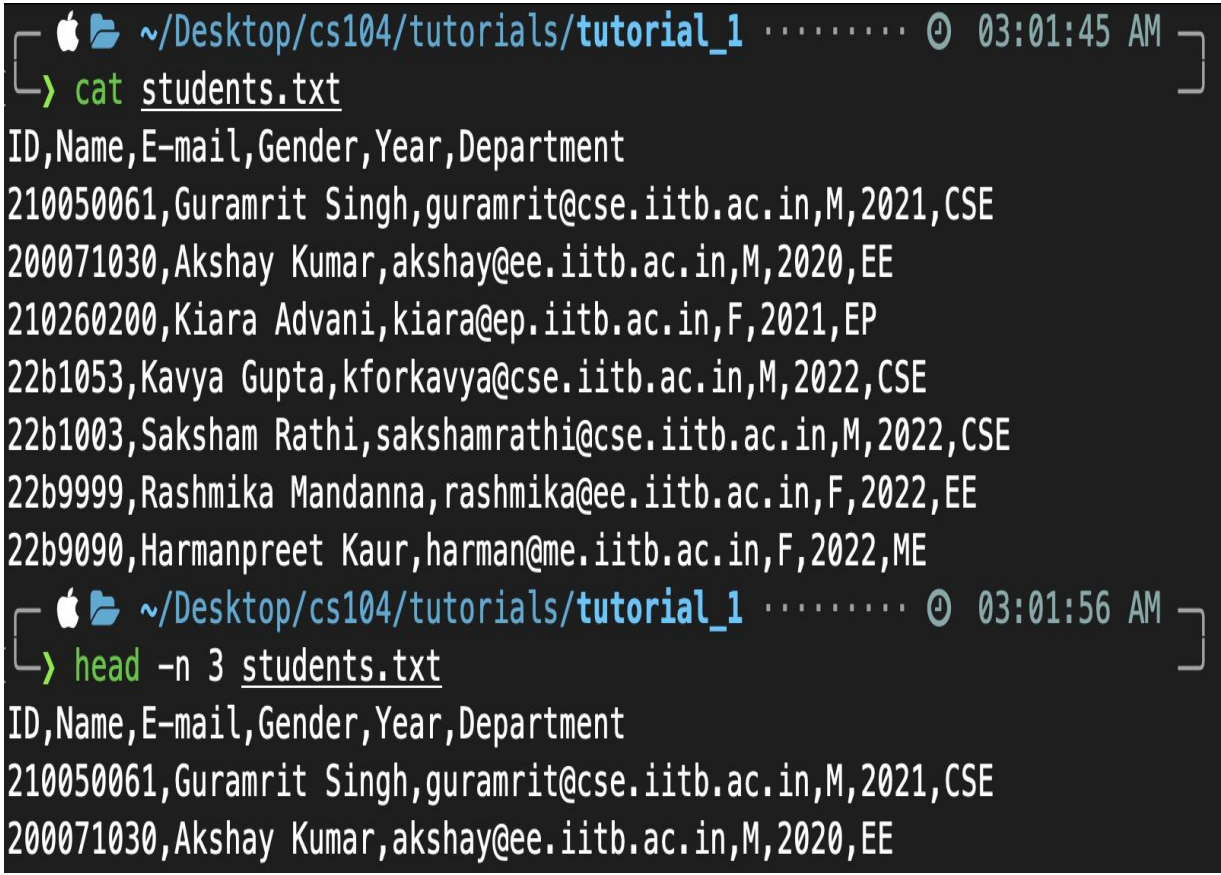
After clear (It cleared the terminal screen)

echo

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

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 students.txt file to terminal.
- Checkout options: -c



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.
- In the example, we used tail to print last 3 lines of students.txt file to terminal.
- Checkout options: -v

```
~/Desktop/cs104/tutorials/tutorial_1 ····· 03:06:02 AM
❯ cat students.txt
ID,Name,E-mail,Gender,Year,Department
210050061,Guramrit Singh,guramrit@cse.iitb.ac.in,M,2021,CSE
200071030,Akshay Kumar,akshay@ee.iitb.ac.in,M,2020,EE
210260200,Kiara Advani,kiara@ep.iitb.ac.in,F,2021,EP
22b1053,Kavya Gupta,kforkavya@cse.iitb.ac.in,M,2022,CSE
22b1003,Saksham Rathi,sakshamrathi@cse.iitb.ac.in,M,2022,CSE
22b9999,Rashmika Mandanna,rashmika@ee.iitb.ac.in,F,2022,EE
22b9090,Harmanpreet Kaur,harman@me.iitb.ac.in,F,2022,ME
~/Desktop/cs104/tutorials/tutorial_1 ····· 03:06:03 AM
❯ tail -n 3 students.txt
22b1003,Saksham Rathi,sakshamrathi@cse.iitb.ac.in,M,2022,CSE
22b9999,Rashmika Mandanna,rashmika@ee.iitb.ac.in,F,2022,EE
22b9090,Harmanpreet Kaur,harman@me.iitb.ac.in,F,2022,ME
```

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

One solution is to create all directories one by one.

An alternative is to generate multiple directories simultaneously, rather than individually creating each one separately.

Notice the use of {}.

```
~/Desktop/cs104/tutorials/tutorial_1 ····· 03:23:46 AM
❯ ls -R
~/Desktop/cs104/tutorials/tutorial_1 ····· 03:23:53 AM
❯ mkdir Vehicles
~/Desktop/cs104/tutorials/tutorial_1 ····· 03:23:59 AM
❯ mkdir Vehicles/{Cars,Trains,Aeroplanes,Ships}
~/Desktop/cs104/tutorials/tutorial_1 ····· 03:24:41 AM
❯ mkdir Vehicles/Cars/{Audi,BMW,Jaguar}
~/Desktop/cs104/tutorials/tutorial_1 ····· 03:25:03 AM
❯ ls -R
Vehicles

./Vehicles:
Aeroplanes  Cars  Ships  Trains

./Vehicles/Aeroplanes:

./Vehicles/Cars:
Audi  BMW  Jaguar

./Vehicles/Cars/Audi:

./Vehicles/Cars/BMW:

./Vehicles/Cars/Jaguar:

./Vehicles/Ships:

./Vehicles/Trains:
```

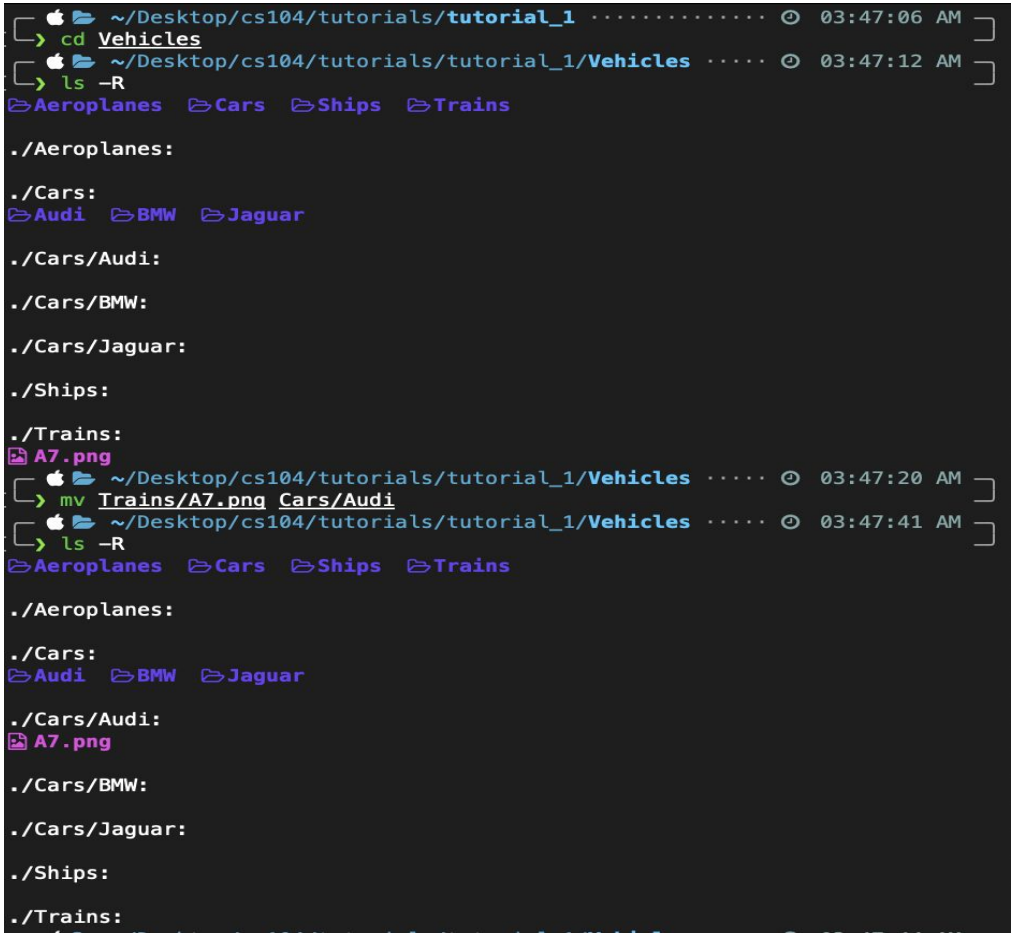
Exercise 2

An employee mistakenly placed A7.png in Trains directory, help him move the image to the right location.

(Well if you don’t know, then keep in mind that A7 is an Audi car)

Solution 2

1. First we change directory into Vehicles folder using the cd command. (This step was not necessary but for the sake of demonstration let's do it)
2. Now it's a simple application of mv command, we move the A7.png from Trains directory to Cars/Audi directory.



Exercise 3

Audi has decided to discontinue it's C model line, so the employer has asked you to remove all png files that belonged to the C model line.

Hint: You need to delete all png images in Audi folder that begins with the letter C.

Solution 3

```
~/Desktop/cs104/tutorials/tutorial_1 ····· 04:06:24 AM
❯ cd Vehicles/Cars/Audi
~/Desktop/cs104/tutorials/tutorial_1/Vehicles/Cars/Audi ···· 04:06:58 AM
❯ ls
A1.png  A5.png  A9.png  C3.png  C7.png
A3.png  A7.png  C1.png  C5.png  C9.png
~/Desktop/cs104/tutorials/tutorial_1/Vehicles/Cars/Audi ···· 04:07:00 AM
❯ rm C*.png
~/Desktop/cs104/tutorials/tutorial_1/Vehicles/Cars/Audi ···· 04:07:07 AM
❯ ls
A1.png  A3.png  A5.png  A7.png  A9.png
```

1. First we change directory to Audi 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 C*.png that will remove all .png files beginning with character C.

Exercise 4

Given the file sold.txt in the Vehicles directory.
This file contains information about all vehicles sold. As you would expect, this is a very long file.

Your employer has assigned you the task of finding the details of the last car that was sold.

Solution 4

```
~/Desktop/cs104/tutorials/tutorial_1/Vehicles ·····  04:24:49 AM
❯ cat sold.txt
Company,Model,Transmission,Year,Engine,Doors
Audi,A3,Manual,2020,1500 (cc),5 doors
BMW,320d,Manual,2022,2000 (cc),5 doors
Jaguar,XE,Manual,2022,2000 (cc),5 doors
Audi,Q3,Manual,2023,2000 (cc),5 doors
Audi,Q5,Manual,2023,2000 (cc),5 doors
BMW,X1,Manual,2024,2000 (cc),5 doors
BMW,X3,Manual,2024,2000 (cc),5 doors
~/Desktop/cs104/tutorials/tutorial_1/Vehicles ·····  04:24:50 AM
❯ tail -n 1 sold.txt
BMW,X3,Manual,2024,2000 (cc),5 doors
```

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 !!!