



# SUMMER SCHOOL 2021

## Additional Flags and Finding Files

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### Summary of commands used in this lecture

| Command      | Meaning                                      |
|--------------|----------------------------------------------|
| <b>echo</b>  | Print text to screen                         |
| <b>ls</b>    | List items in current directory              |
| <b>mv</b>    | Used to move/rename a file/directory         |
| <b>find</b>  | Command used to find specific files in Linux |
| <b>cd</b>    | Change directory                             |
| <b>mkdir</b> | Used to make a new directory                 |
| <b>rm</b>    | Used to remove a file/directory              |

- As in the previous lectures all commands provided in **BOLD** and center aligned from here onwards are commands that can be typed/executed directly in a terminal.
- Create a file called **myinfo.txt** that contains some text:

**echo 'Here is my information' > myinfo.txt**

**ls**

```

Welcome to CoCalc - CoCalc
https://cocalc.com/projects/fe442502-29bd-41d1-82a2-0610edfd6916/files/Linux.term?session=default
Projects Welcome to CoCalc! Thank you for trying CoCalc! Please sign up to avoid losing your work.
Files New Log Find Linux.term
File v Search Pause Copy Paste Undo Redo Guide Help ~
~$ echo "Here is my information" > myinfo.txt
~$ ls
Linux.term  myinfo.txt
~$

```

- You could have also created the file by making use of a text editor.
- In my case **ls** shows that I have the files **Linux.term** and **myinfo.txt** contained in my current directory.

If I wish to obtain more information about my files, then I need to add an additional flag to **ls**:

**ls -l**

```

~$ ls -l
total 2
-rw-r--r-- 1 user user 0 Jan 11 11:02 Linux.term
-rw-r--r-- 1 user user 23 Jan 11 11:04 myinfo.txt

```

Annotations in the image:

- Permissions:** A box containing 'User', 'Group', and 'Other' with arrows pointing to the permission bits (r, w, r) of the first file.
- User:** A box with an arrow pointing to the 'user' field of the first file.
- Group:** A box with an arrow pointing to the 'user' field of the first file.
- Size:** A box with an arrow pointing to the '23' field of the second file.
- Creation date and time:** A box with an arrow pointing to the 'Jan 11 11:04' field of the second file.

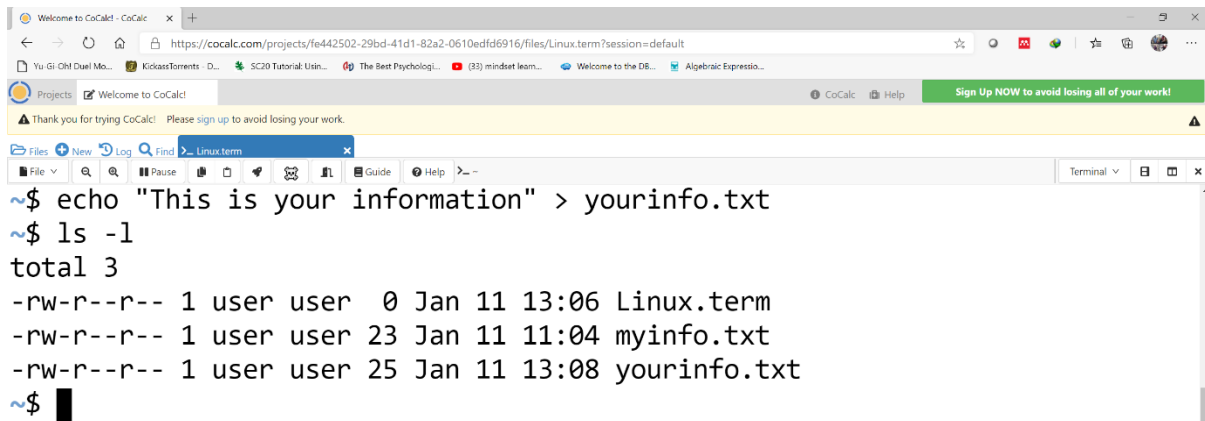
Note the date and time when my files were created will differ from yours as this material was prepared.

- The information provided includes the permissions of the file/directory (who is allowed to access and make changes to the contents), the User that created the file, which Group the user belongs to, the size of the file and the date and time when the file/directory was created or changed.

- Create another file called **yourinfo.txt** that contains some text:

**echo 'Here is your information' > yourinfo.txt**

**ls -l**



```

Welcome to CoCalc - CoCalc
https://cocalc.com/projects/fe442502-29bd-41d1-82a2-0610edfd6916/files/Linux.term?session=default
Projects Welcome to CoCalc! CoCalc Help Sign Up NOW to avoid losing all of your work!
Thank you for trying CoCalc! Please sign up to avoid losing your work.
Files New Log Find Linux.term
File v Search Pause Copy Paste Help >-
~$ echo "This is your information" > yourinfo.txt
~$ ls -l
total 3
-rw-r--r-- 1 user user 0 Jan 11 13:06 Linux.term
-rw-r--r-- 1 user user 23 Jan 11 11:04 myinfo.txt
-rw-r--r-- 1 user user 25 Jan 11 13:08 yourinfo.txt
~$

```

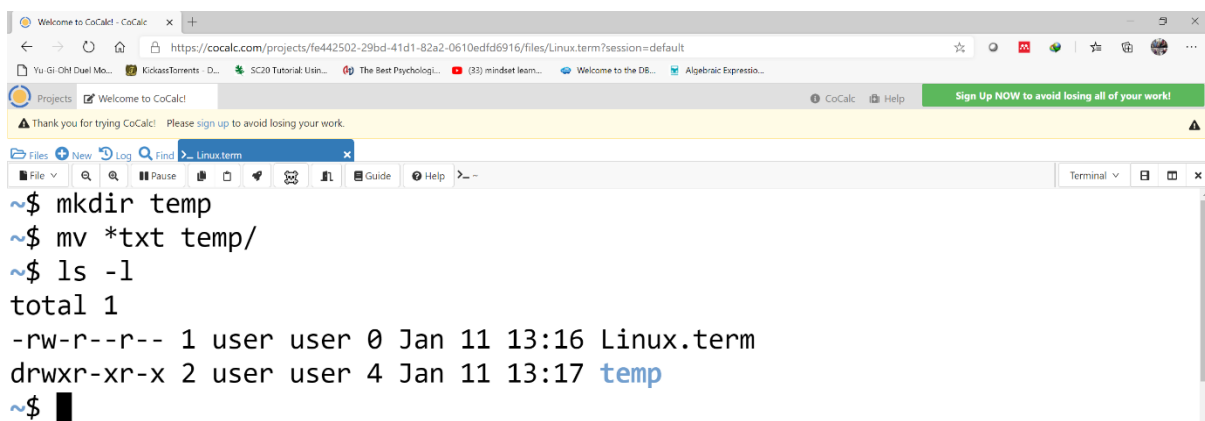
- Our directory now has two files that were created at different times and have sizes that are slightly different.

- Create a directory called **temp** and move the txt files into this directory:

**mkdir temp**

**mv \*txt temp/**

**ls -l**



```

Welcome to CoCalc - CoCalc
https://cocalc.com/projects/fe442502-29bd-41d1-82a2-0610edfd6916/files/Linux.term?session=default
Projects Welcome to CoCalc! CoCalc Help Sign Up NOW to avoid losing all of your work!
Thank you for trying CoCalc! Please sign up to avoid losing your work.
Files New Log Find Linux.term
File v Search Pause Copy Paste Help >-
~$ mkdir temp
~$ mv *txt temp/
~$ ls -l
total 1
-rw-r--r-- 1 user user 0 Jan 11 13:16 Linux.term
drwxr-xr-x 2 user user 4 Jan 11 13:17 temp
~$

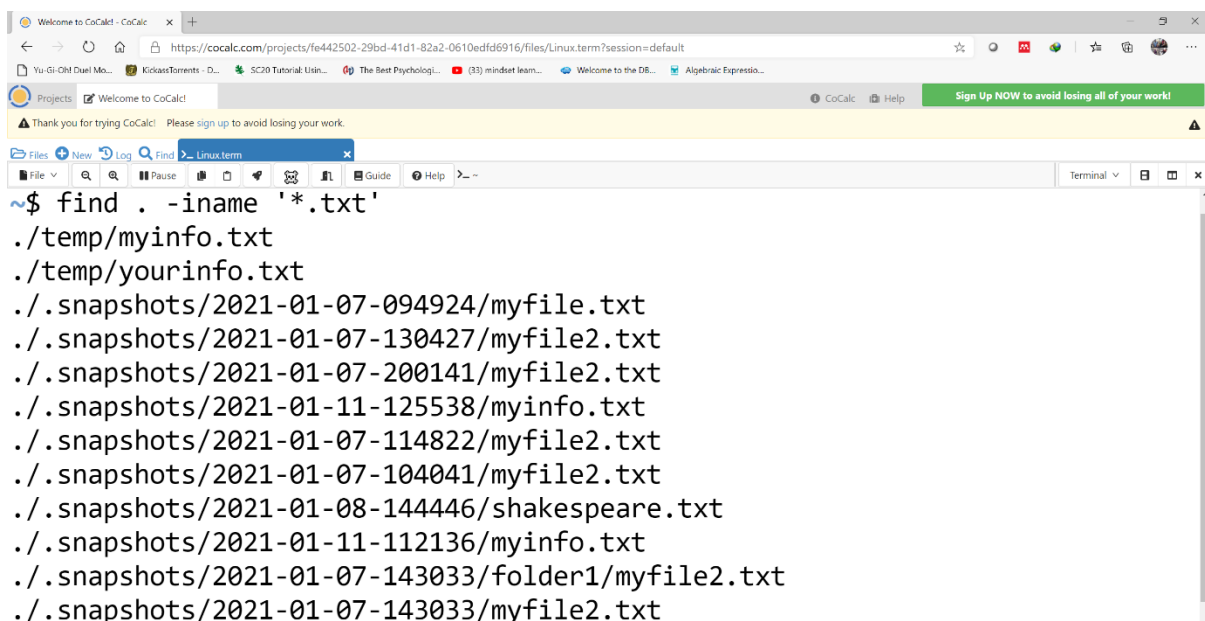
```

- In the current case we know that our two txt files are contained within the directory **temp** as we just moved them there.

However, what if we created these files 6 months ago and we placed them in a directory that was 20 subdirectories each with their own set of files and we have a total of 1 million files that we need to search through in order to find the files we are looking for. It does not make sense to go to each directory/subdirectory one at a time before we locate what we are looking for.

- For the above scenario we need to make use of:

**find . -name '\*.txt'**



```

Welcome to CoCalc - CoCalc
https://cocalc.com/projects/fe442502-29bd-41d1-82a2-0610edfd6916/files/Linux.term?session=default
Projects Welcome to CoCalc! CoCalc Help Sign Up NOW to avoid losing all of your work!
Thank you for trying CoCalc! Please sign up to avoid losing your work.
Files New Log Find Linux.term
File v Search Pause Copy Paste Undo Redo Guide Help ~
~$ find . -iname '*.txt'
./temp/myinfo.txt
./temp/yourinfo.txt
./snapshots/2021-01-07-094924/myfile.txt
./snapshots/2021-01-07-130427/myfile2.txt
./snapshots/2021-01-07-200141/myfile2.txt
./snapshots/2021-01-11-125538/myinfo.txt
./snapshots/2021-01-07-114822/myfile2.txt
./snapshots/2021-01-07-104041/myfile2.txt
./snapshots/2021-01-08-144446/shakespeare.txt
./snapshots/2021-01-11-112136/myinfo.txt
./snapshots/2021-01-07-143033/folder1/myfile2.txt
./snapshots/2021-01-07-143033/myfile2.txt

```

- The **find** command tells Linux that it must start looking for all files from the current directory (.), upwards (i.e. directories and subdirectories that exist within our present working directory) and provide a list of files that ends with **.txt**.
- The command shows several files that have **.txt** and this list seems to contain files which we removed in previous lectures.

This is merely due to CoCalc keeping a backup of some of our older files, but this does not happen on typical Linux systems.

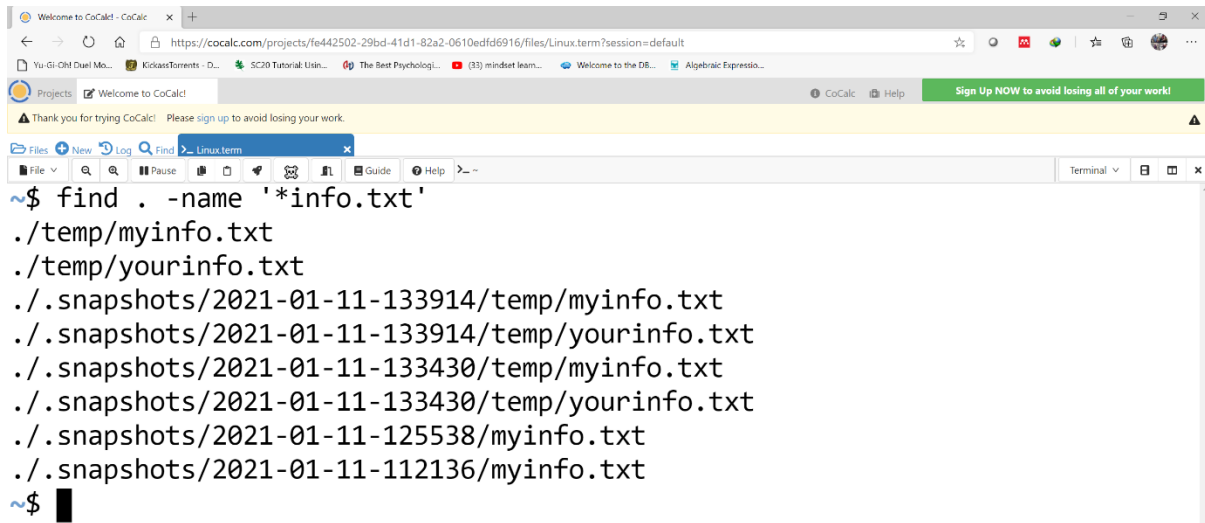
Note the present working directory would be your home directory (**/home/users** for example).

If you are working in Windows, Linux or MacOS you will not see the snapshot entries.

If you are working in CoCalc your snapshot entry list may not be the same as mine.

- Let's try to isolate our search to provide only the files that we created and moved during this lecture:

**find . -name '\*info.txt'**

A screenshot of a web browser window displaying a CoCalc terminal. The terminal shows the command `find . -name '*info.txt'` and its output, which lists several files in the `temp` directory and its snapshots. The files are `myinfo.txt` and `yourinfo.txt` in the `temp` directory, and their counterparts in various snapshot directories.

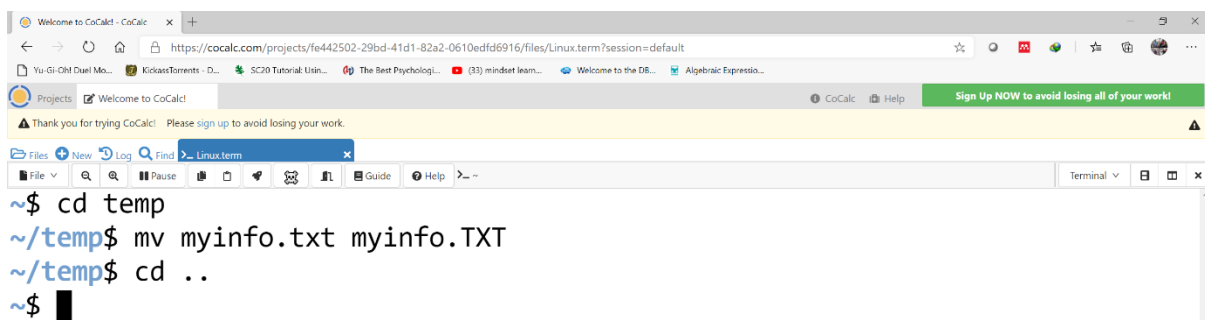
```
~$ find . -name '*info.txt'
./temp/myinfo.txt
./temp/yourinfo.txt
./snapshots/2021-01-11-133914/temp/myinfo.txt
./snapshots/2021-01-11-133914/temp/yourinfo.txt
./snapshots/2021-01-11-133430/temp/myinfo.txt
./snapshots/2021-01-11-133430/temp/yourinfo.txt
./snapshots/2021-01-11-125538/myinfo.txt
./snapshots/2021-01-11-112136/myinfo.txt
~$
```

- Compared to previously there is less information provided.

The entries that are of interest to us are the first two lines, which tells us that in the directory called **temp** we will find a file called **myinfo.txt** and another file called **yourinfo.txt**.

- Rename one of the files:

**cd temp**  
**mv myinfo.txt myinfo.TXT**  
**cd ..**

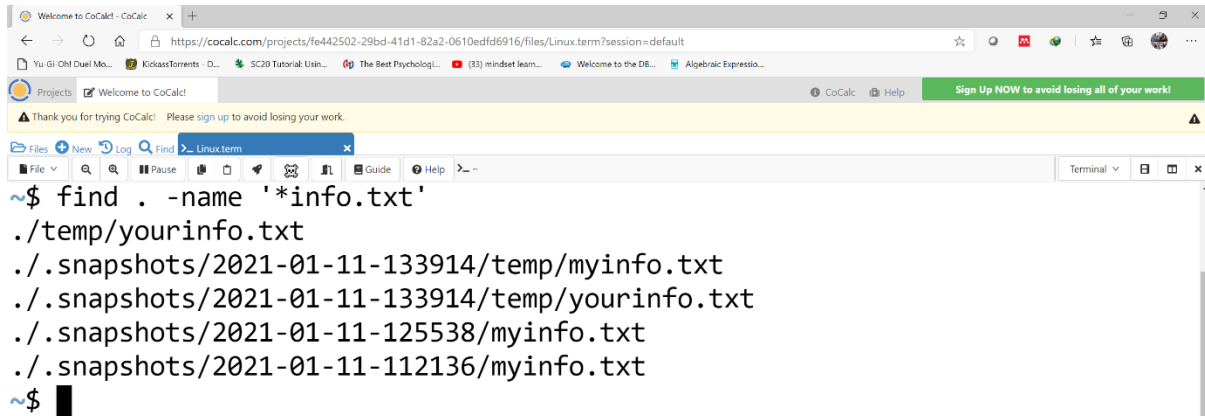
A screenshot of a web browser window displaying a CoCalc terminal. The terminal shows the sequence of commands: `cd temp`, `mv myinfo.txt myinfo.TXT`, and `cd ..`. The prompt changes from `~$` to `~/temp$` and back to `~$`.

```
~$ cd temp
~/temp$ mv myinfo.txt myinfo.TXT
~/temp$ cd ..
~$
```

- Since the files are contained inside of the **temp** directory we first cd into the directory and then rename the file, changing the extension from **.txt** to **.TXT**, thereafter we change back to our **home** directory which is one directory back.

- Now we run the **find** command again:

**find . -name '\*info.txt'**

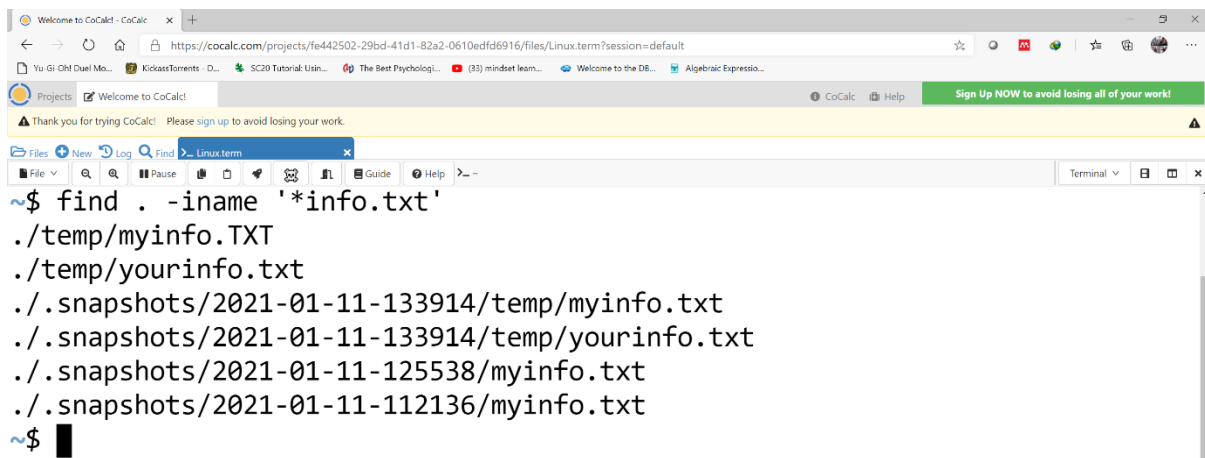


```
~$ find . -name '*info.txt'
./temp/yourinfo.txt
./snapshots/2021-01-11-133914/temp/myinfo.txt
./snapshots/2021-01-11-133914/temp/yourinfo.txt
./snapshots/2021-01-11-125538/myinfo.txt
./snapshots/2021-01-11-112136/myinfo.txt
~$
```

- The entry **myinfo.TXT** does not seem to appear in our list.  
This is because **find**, like most Linux commands, is case sensitive.

- To remove the case sensitivity, we can do the following:

**find . -iname '\*info.txt'**



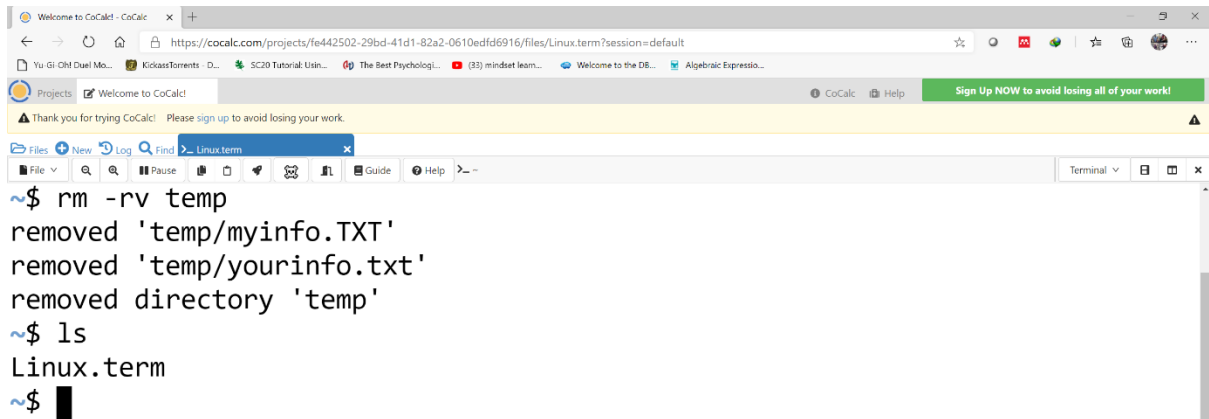
```
~$ find . -iname '*info.txt'
./temp/myinfo.TXT
./temp/yourinfo.txt
./snapshots/2021-01-11-133914/temp/myinfo.txt
./snapshots/2021-01-11-133914/temp/yourinfo.txt
./snapshots/2021-01-11-125538/myinfo.txt
./snapshots/2021-01-11-112136/myinfo.txt
~$
```

- Now we see that the **myinfo.TXT** entry is present.
- By using **-iname** instead of **-name** we are telling **find** to look for files that contain the text provided in the quotes regardless of whether the files found are in uppercase or lowercase letters.

- Remove the folder temp and all its contents:

**rm -rv temp**

**ls**



```
~$ rm -rv temp
removed 'temp/myinfo.TXT'
removed 'temp/yourinfo.txt'
removed directory 'temp'
~$ ls
Linux.term
~$
```

- This brings us to the end of **Additional Flags and Finding Files**.
- There will be **NO** exercise for this section as it is merely presented so that when you use a Linux system you are aware that these additional options are available to you.