

# **THE INSTITUTE OF FINANCE MANAGEMENT**



**FACULTY OF COMPUTING, INFORMATION SYSTEM AND MATHEMATICS**

**DEPARTMENT OF COMPUTER SCIENCE**

**BACHELOR OF SCIENCE IN COMPUTER SCIENCE**

**ADVANCED OPERATING SYETEM – CSU07308**

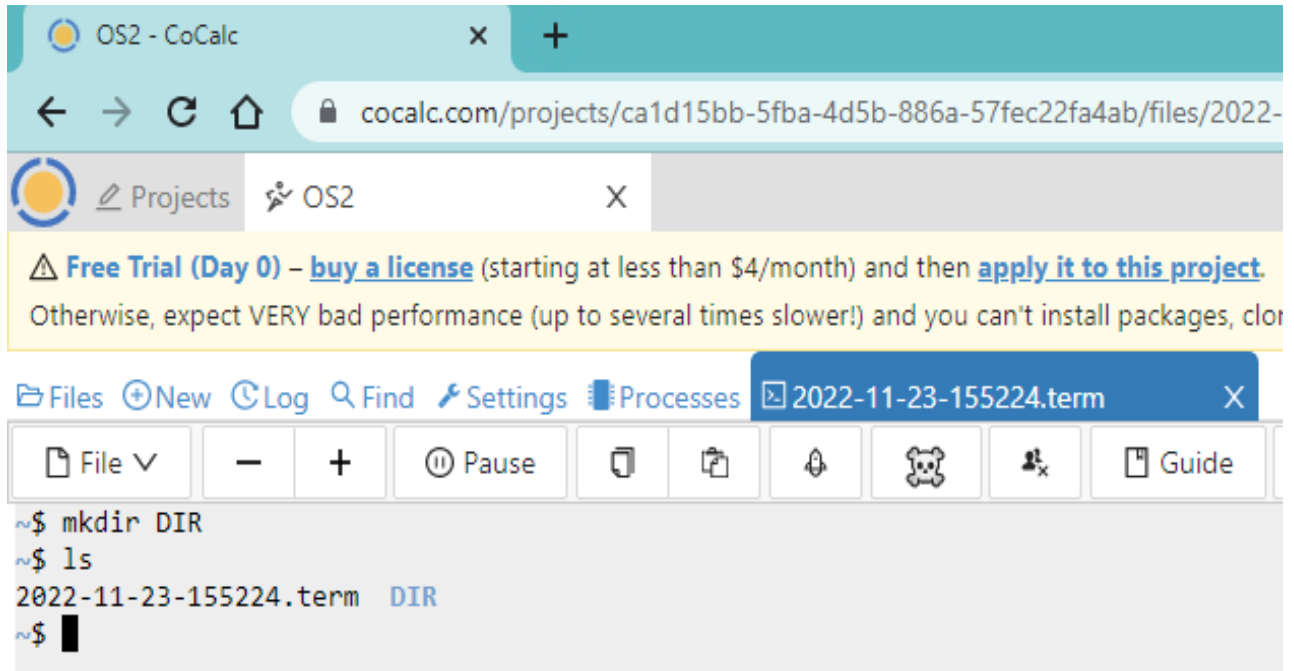
**ASSIGNMENT: SHELL PROGRAMMING**

**BCS 2**

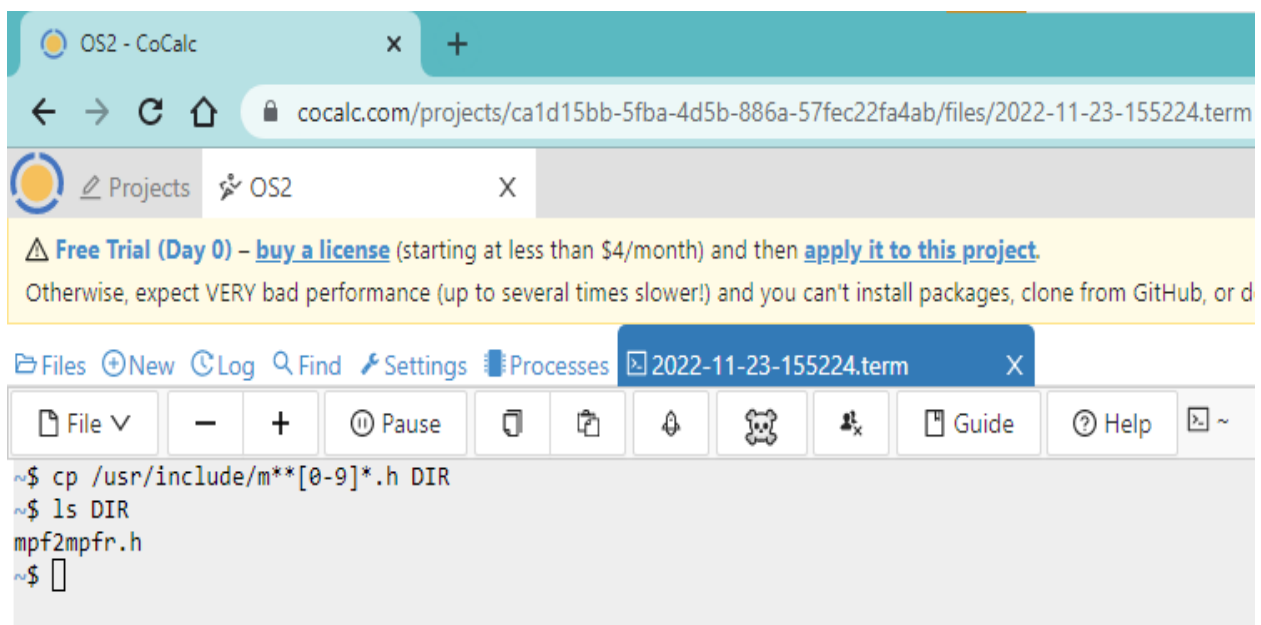
## **PARTICIPANTS**

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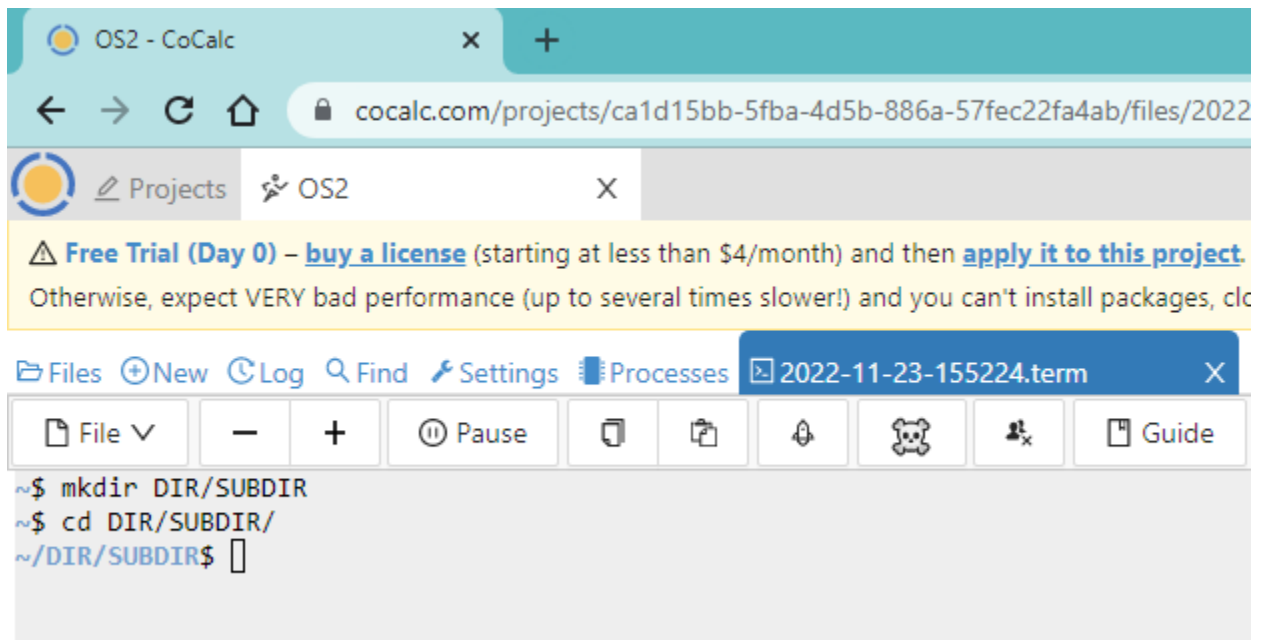
QN 1.



QN 2.



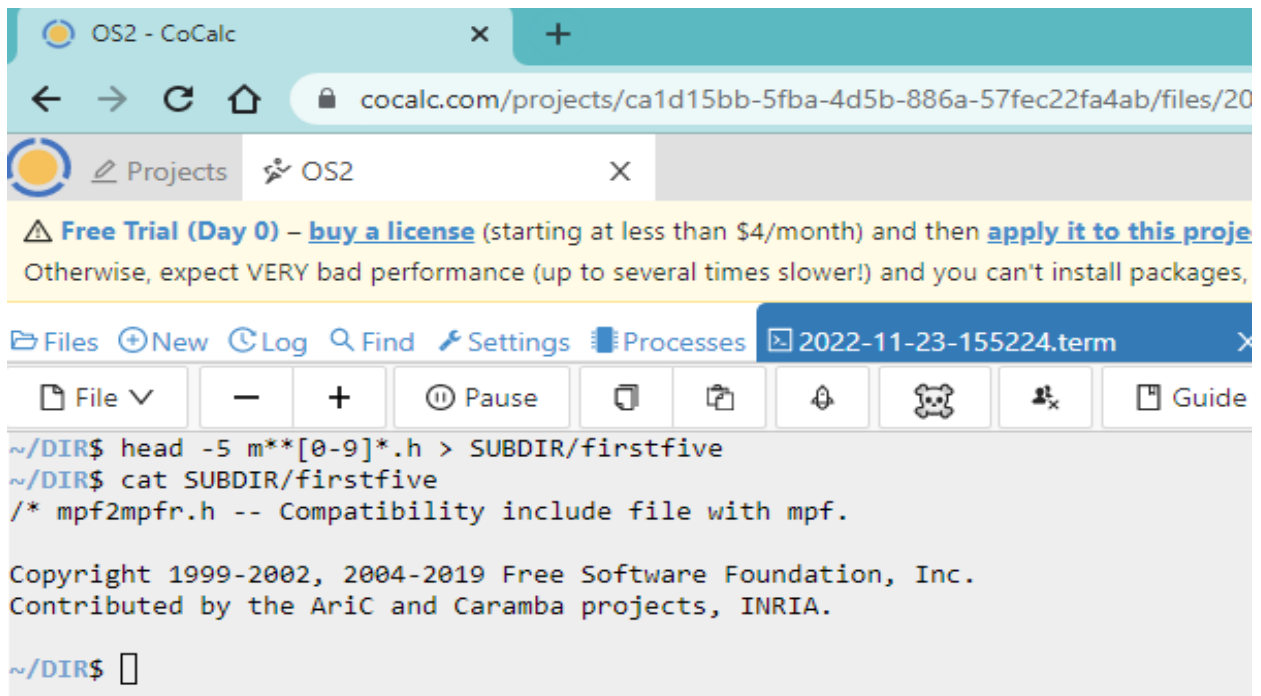
QN 3.



The screenshot shows the CoCalc web interface in a browser. The address bar displays the URL `cocalc.com/projects/ca1d15bb-5fba-4d5b-886a-57fec22fa4ab/files/2022`. The interface includes a top navigation bar with 'Projects' and 'OS2' tabs. A yellow banner at the top contains a warning about a free trial and a link to buy a license. Below this is a menu bar with options like 'Files', 'New', 'Log', 'Find', 'Settings', and 'Processes'. The main area is a terminal window titled '2022-11-23-155224.term' showing the following commands and output:

```
~$ mkdir DIR/SUBDIR
~$ cd DIR/SUBDIR/
~/DIR/SUBDIR$
```

QN 4.



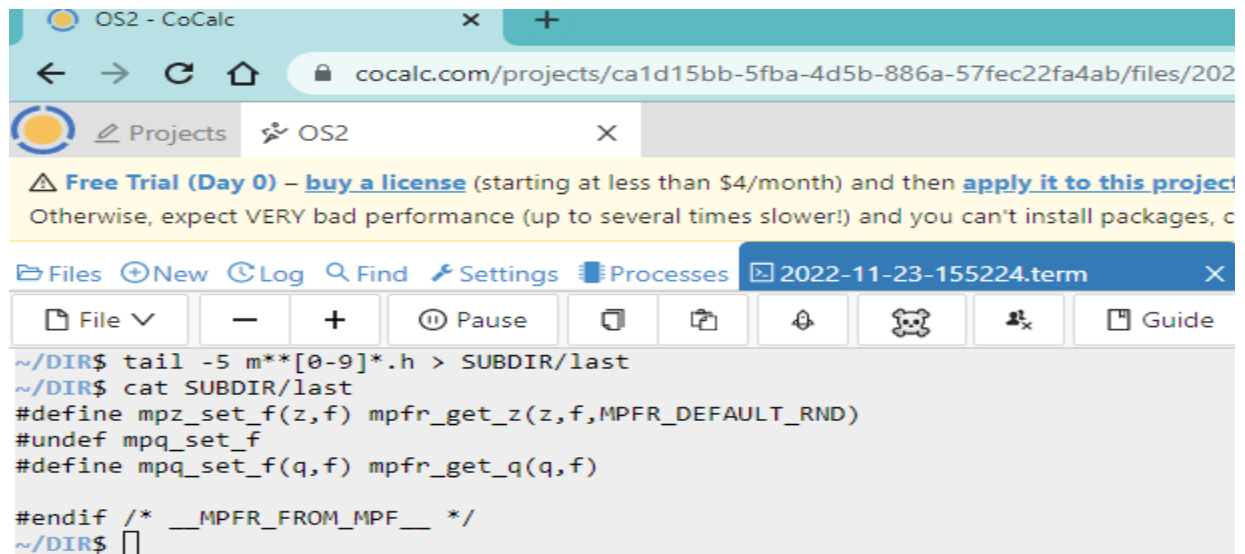
The screenshot shows the CoCalc web interface in a browser, similar to the previous one. The address bar displays the URL `cocalc.com/projects/ca1d15bb-5fba-4d5b-886a-57fec22fa4ab/files/2022`. The interface includes a top navigation bar with 'Projects' and 'OS2' tabs. A yellow banner at the top contains a warning about a free trial and a link to buy a license. Below this is a menu bar with options like 'Files', 'New', 'Log', 'Find', 'Settings', and 'Processes'. The main area is a terminal window titled '2022-11-23-155224.term' showing the following commands and output:

```
~/DIR$ head -5 m**[0-9]*.h > SUBDIR/firstfive
~/DIR$ cat SUBDIR/firstfive
/* mpf2mpfr.h -- Compatibility include file with mpf.

Copyright 1999-2002, 2004-2019 Free Software Foundation, Inc.
Contributed by the AriC and Caramba projects, INRIA.

~/DIR$
```

## QN 5.



OS2 - CoCalc

cocalc.com/projects/ca1d15bb-5fba-4d5b-886a-57fec22fa4ab/files/202

Projects OS2

Free Trial (Day 0) – [buy a license](#) (starting at less than \$4/month) and then [apply it to this project](#). Otherwise, expect VERY bad performance (up to several times slower!) and you can't install packages, c

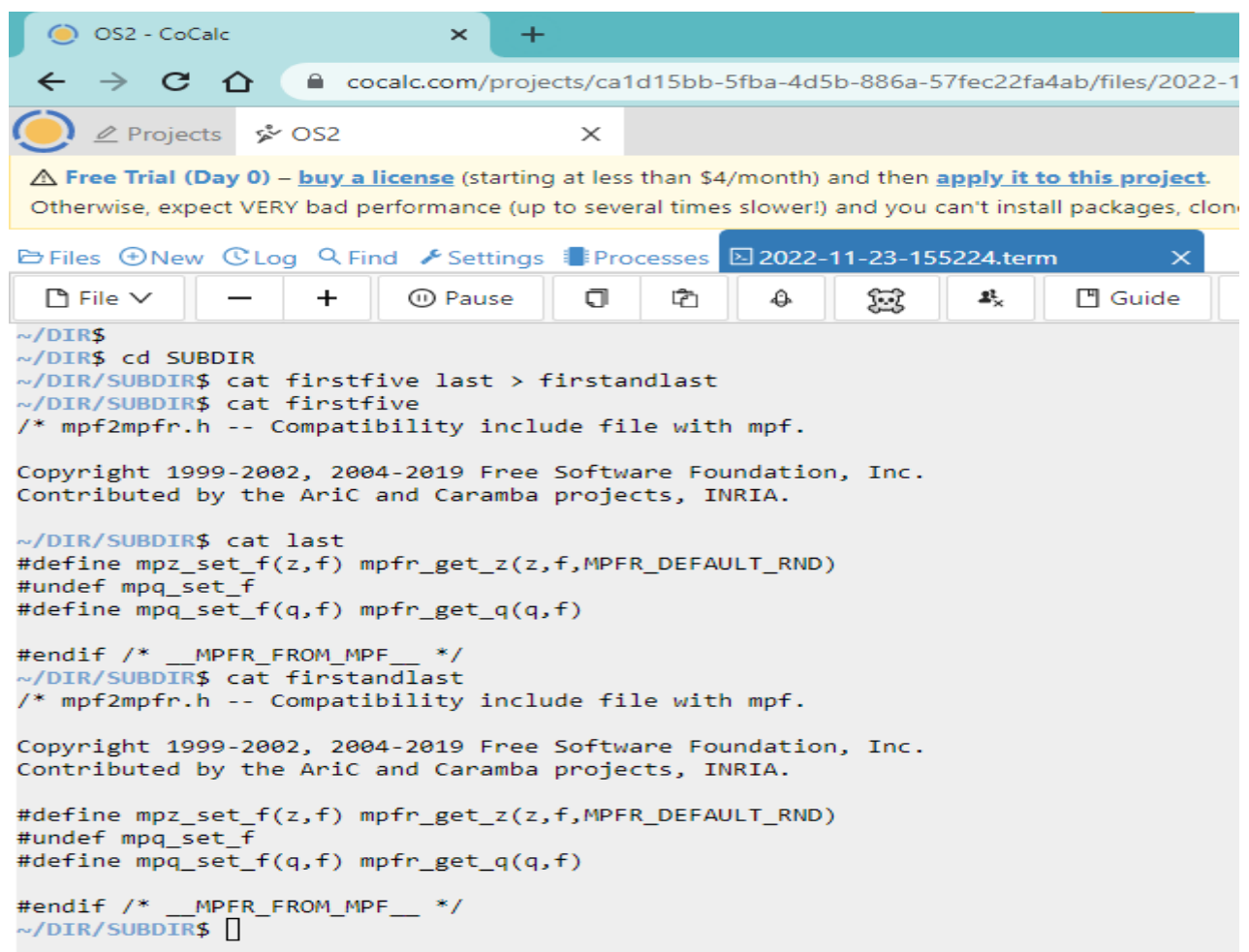
Files New Log Find Settings Processes 2022-11-23-155224.term

File - + Pause

```
~/DIR$ tail -5 m**[0-9]*.h > SUBDIR/last
~/DIR$ cat SUBDIR/last
#define mpz_set_f(z,f) mpfr_get_z(z,f,MPFR_DEFAULT_RND)
#undef mpq_set_f
#define mpq_set_f(q,f) mpfr_get_q(q,f)

#endif /* __MPFR_FROM_MPF__ */
~/DIR$
```

## QN 6.



OS2 - CoCalc

cocalc.com/projects/ca1d15bb-5fba-4d5b-886a-57fec22fa4ab/files/2022-1

Projects OS2

Free Trial (Day 0) – [buy a license](#) (starting at less than \$4/month) and then [apply it to this project](#). Otherwise, expect VERY bad performance (up to several times slower!) and you can't install packages, clon

Files New Log Find Settings Processes 2022-11-23-155224.term

File - + Pause

```
~/DIR$
~/DIR$ cd SUBDIR
~/DIR/SUBDIR$ cat firstfive last > firstandlast
~/DIR/SUBDIR$ cat firstfive
/* mpf2mpfr.h -- Compatibility include file with mpf.

Copyright 1999-2002, 2004-2019 Free Software Foundation, Inc.
Contributed by the AriC and Caramba projects, INRIA.

~/DIR/SUBDIR$ cat last
#define mpz_set_f(z,f) mpfr_get_z(z,f,MPFR_DEFAULT_RND)
#undef mpq_set_f
#define mpq_set_f(q,f) mpfr_get_q(q,f)

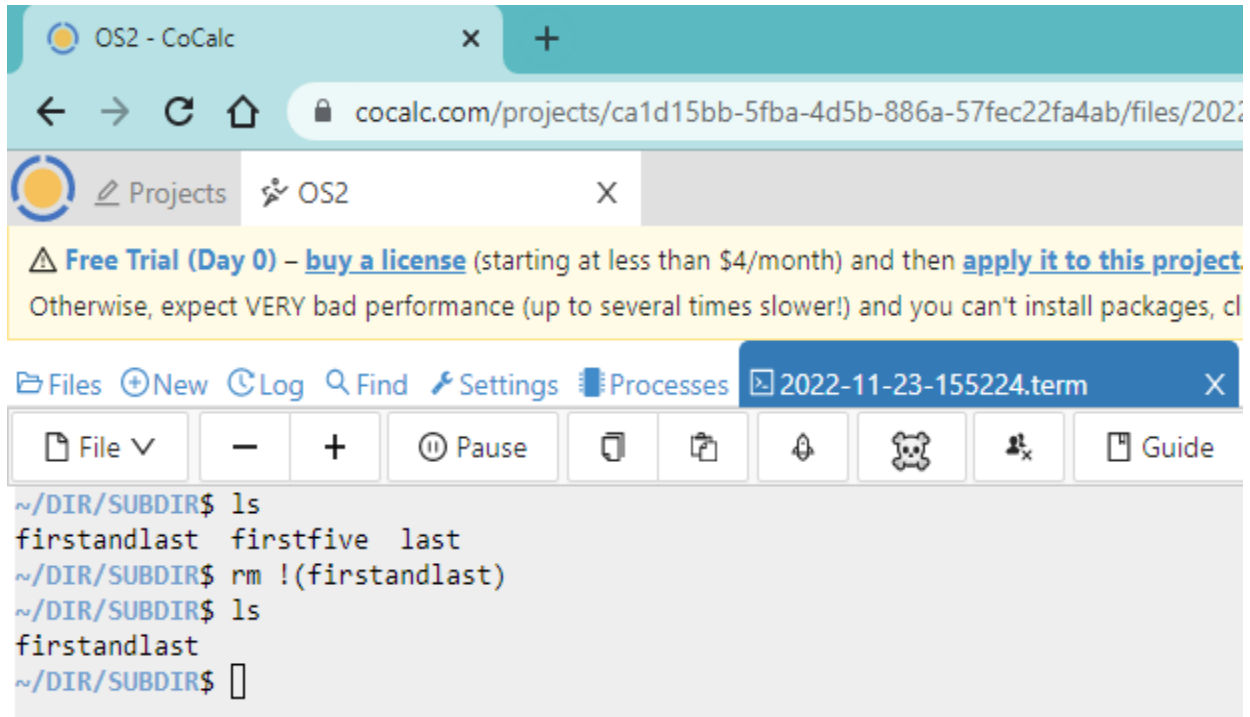
#endif /* __MPFR_FROM_MPF__ */
~/DIR/SUBDIR$ cat firstandlast
/* mpf2mpfr.h -- Compatibility include file with mpf.

Copyright 1999-2002, 2004-2019 Free Software Foundation, Inc.
Contributed by the AriC and Caramba projects, INRIA.

#define mpz_set_f(z,f) mpfr_get_z(z,f,MPFR_DEFAULT_RND)
#undef mpq_set_f
#define mpq_set_f(q,f) mpfr_get_q(q,f)

#endif /* __MPFR_FROM_MPF__ */
~/DIR/SUBDIR$
```

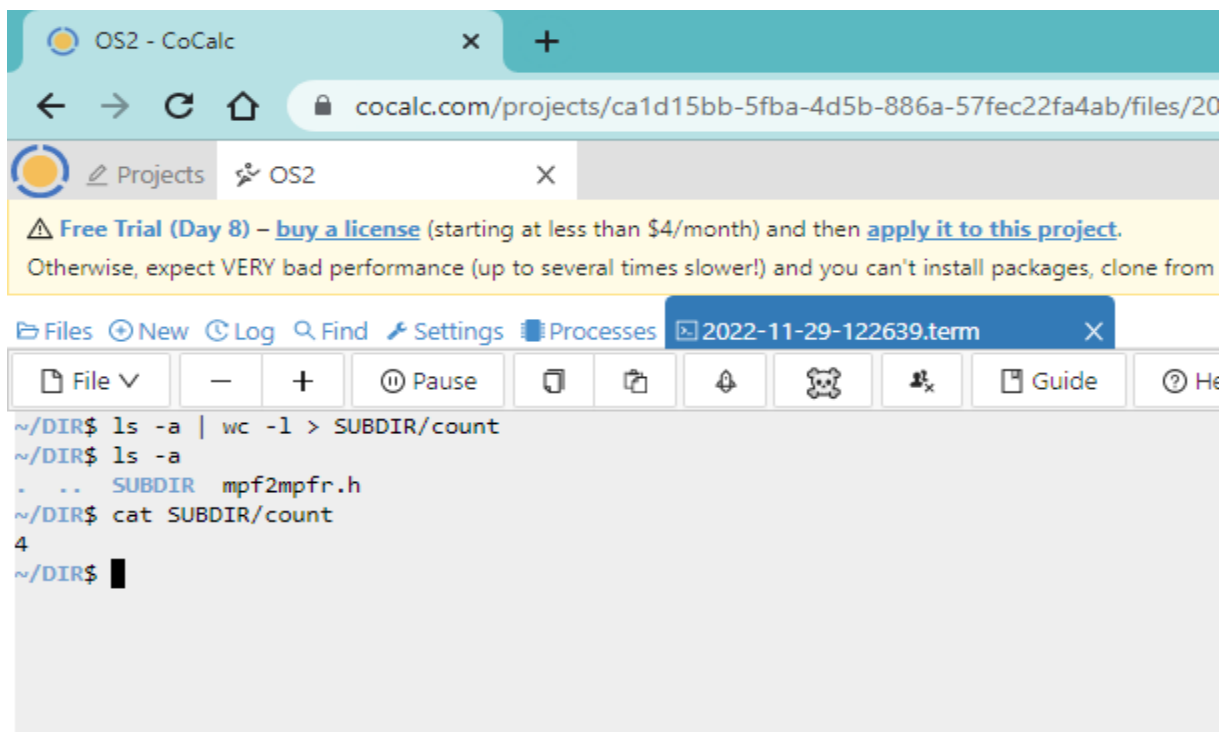
QN 7.



The screenshot shows the CoCalc web interface in a browser. The address bar displays the URL `cocalc.com/projects/ca1d15bb-5fba-4d5b-886a-57fec22fa4ab/files/2022-11-23-155224.term`. The interface includes a top navigation bar with 'Projects' and 'OS2' tabs. A yellow banner at the top contains a warning: 'Free Trial (Day 0) - buy a license (starting at less than \$4/month) and then apply it to this project. Otherwise, expect VERY bad performance (up to several times slower!) and you can't install packages, clone from...'. Below the banner is a menu bar with 'Files', 'New', 'Log', 'Find', 'Settings', and 'Processes'. The terminal window, titled '2022-11-23-155224.term', shows the following commands and output:

```
~/DIR/SUBDIR$ ls
firstandlast  firstfive  last
~/DIR/SUBDIR$ rm !(firstandlast)
~/DIR/SUBDIR$ ls
firstandlast
~/DIR/SUBDIR$
```

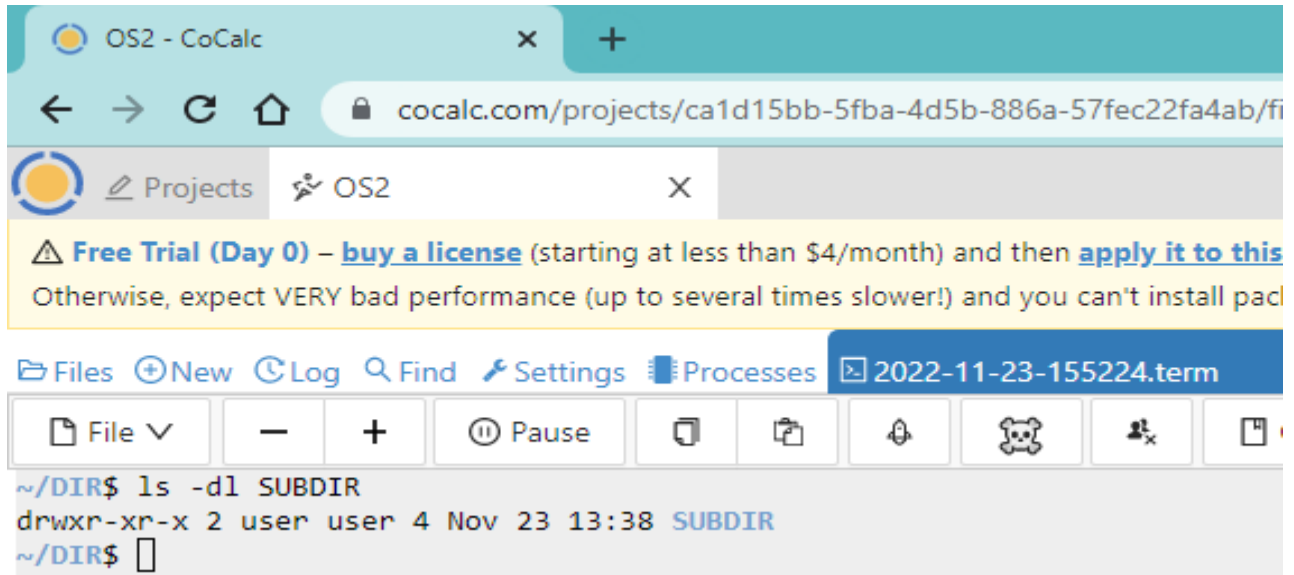
QN 8.



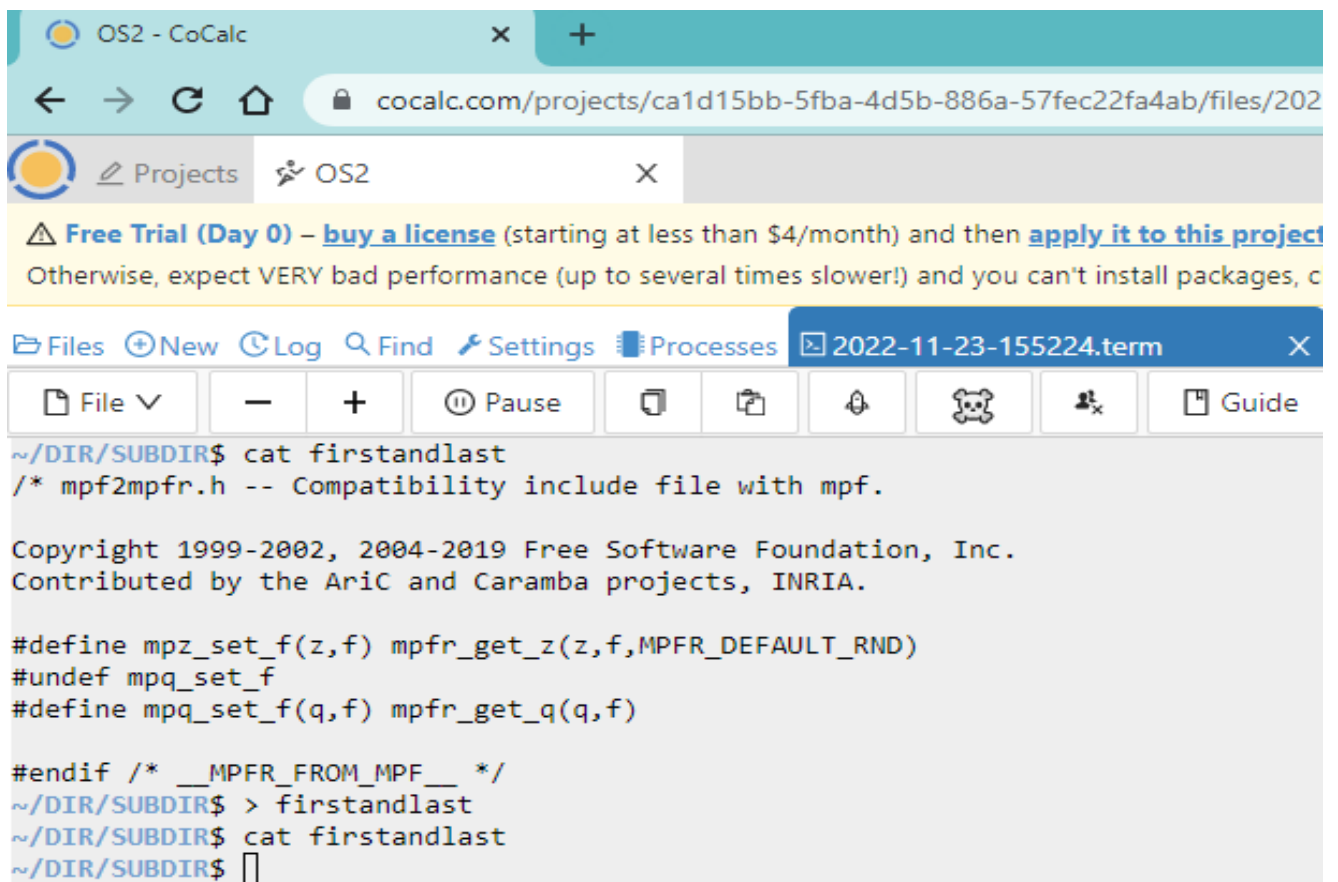
The screenshot shows the CoCalc web interface in a browser. The address bar displays the URL `cocalc.com/projects/ca1d15bb-5fba-4d5b-886a-57fec22fa4ab/files/2022-11-29-122639.term`. The interface includes a top navigation bar with 'Projects' and 'OS2' tabs. A yellow banner at the top contains a warning: 'Free Trial (Day 8) - buy a license (starting at less than \$4/month) and then apply it to this project. Otherwise, expect VERY bad performance (up to several times slower!) and you can't install packages, clone from...'. Below the banner is a menu bar with 'Files', 'New', 'Log', 'Find', 'Settings', and 'Processes'. The terminal window, titled '2022-11-29-122639.term', shows the following commands and output:

```
~/DIR$ ls -a | wc -l > SUBDIR/count
~/DIR$ ls -a
.  ..  SUBDIR  mpf2mpfr.h
~/DIR$ cat SUBDIR/count
4
~/DIR$
```

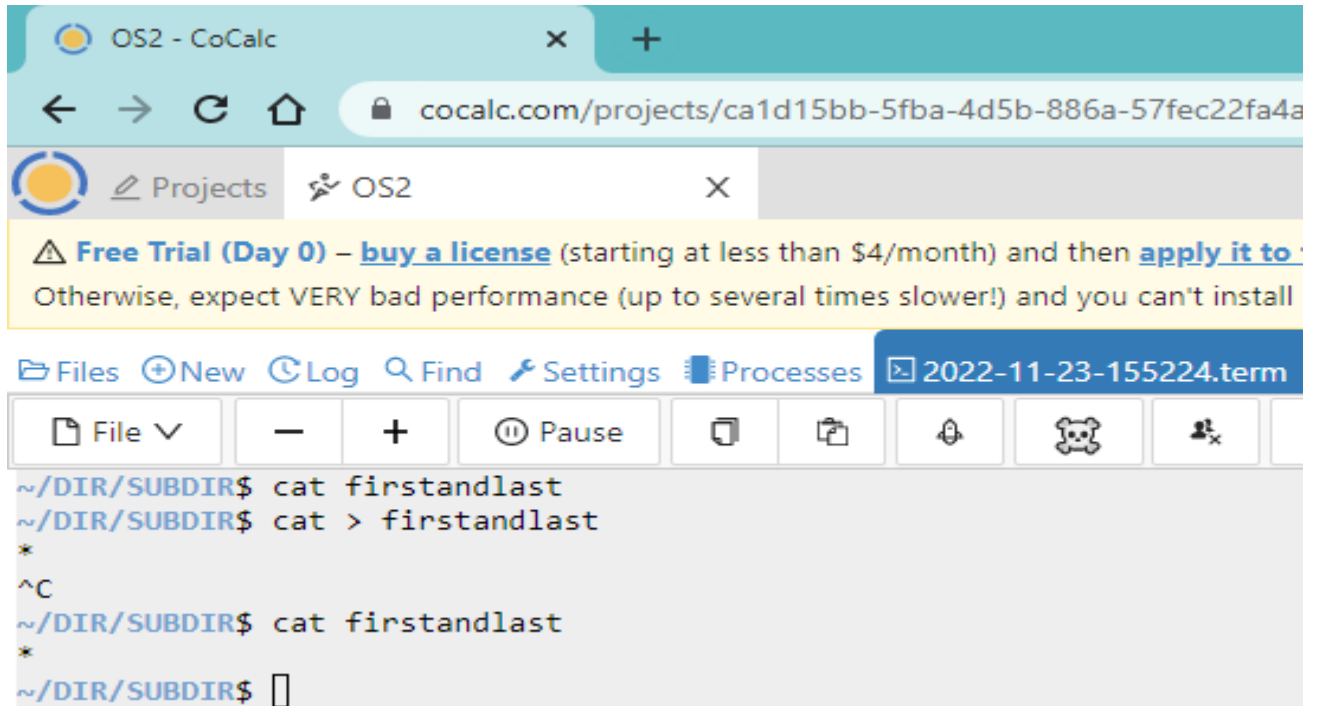
QN 9.



QN 10.



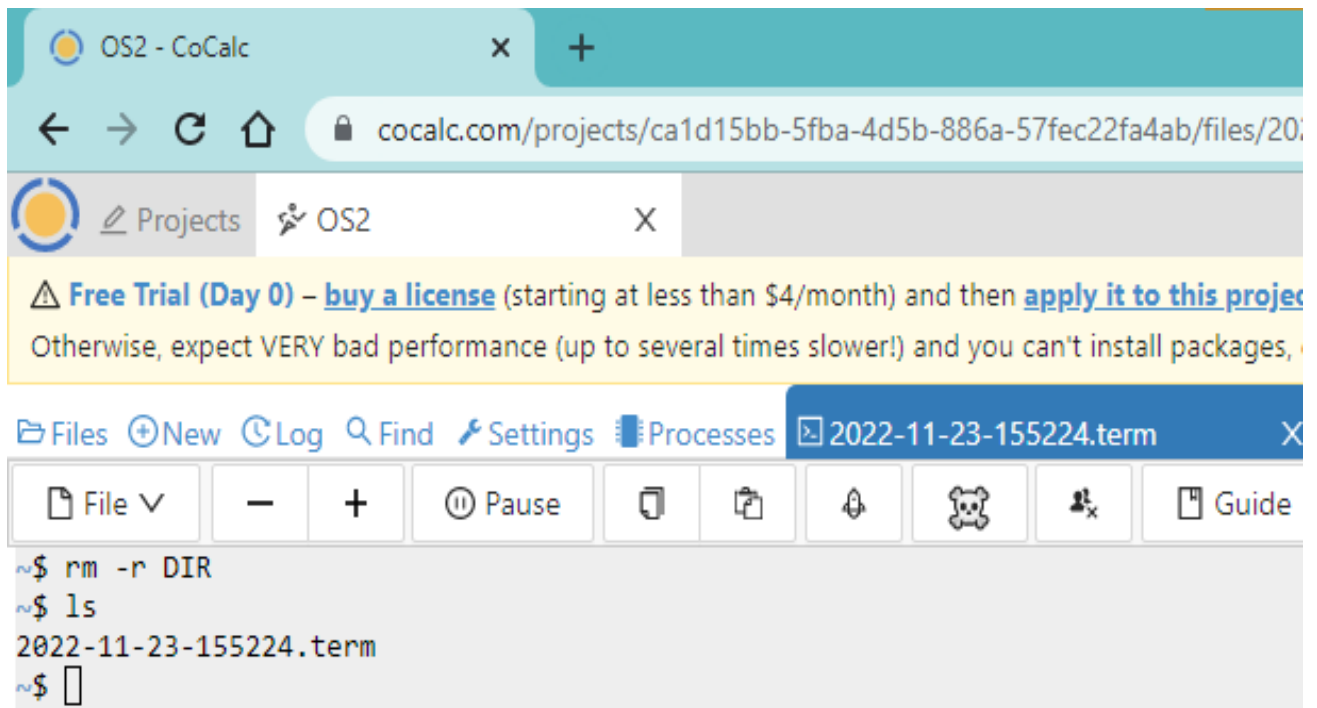
QN 11.



The screenshot shows the CoCalc web interface in a browser. The address bar displays the URL `cocalc.com/projects/ca1d15bb-5fba-4d5b-886a-57fec22fa4a`. Below the browser window, the CoCalc interface includes a header with "OS2 - CoCalc" and a "Projects" tab. A yellow banner at the top of the workspace area contains a warning: "Free Trial (Day 0) - [buy a license](#) (starting at less than \$4/month) and then [apply it to](#) . Otherwise, expect VERY bad performance (up to several times slower!) and you can't install". The main workspace area has a menu bar with "Files", "New", "Log", "Find", "Settings", and "Processes". Below the menu bar is a toolbar with icons for "File", "Pause", and other functions. The terminal window shows the following commands and output:

```
~/DIR/SUBDIR$ cat firstandlast
~/DIR/SUBDIR$ cat > firstandlast
*
^C
~/DIR/SUBDIR$ cat firstandlast
*
~/DIR/SUBDIR$
```

QN 12.



The screenshot shows the CoCalc web interface in a browser. The address bar displays the URL `cocalc.com/projects/ca1d15bb-5fba-4d5b-886a-57fec22fa4ab/files/2022-11-23-155224.term`. Below the browser window, the CoCalc interface includes a header with "OS2 - CoCalc" and a "Projects" tab. A yellow banner at the top of the workspace area contains a warning: "Free Trial (Day 0) - [buy a license](#) (starting at less than \$4/month) and then [apply it to this project](#) . Otherwise, expect VERY bad performance (up to several times slower!) and you can't install packages, .". The main workspace area has a menu bar with "Files", "New", "Log", "Find", "Settings", and "Processes". Below the menu bar is a toolbar with icons for "File", "Pause", and other functions. The terminal window shows the following commands and output:

```
~$ rm -r DIR
~$ ls
2022-11-23-155224.term
~$
```

### QN 13.

OS2 - CoCalc

cocalc.com/projects/ca1d15bb-5fba-4d5b-886a-57fec22fa4ab/files/2022-11-23-1552

Projects OS2

Free Trial (Day 0) – [buy a license](#) (starting at less than \$4/month) and then [apply it to this project](#).  
Otherwise, expect VERY bad performance (up to several times slower!) and you can't install packages, clone from Git-

Files New Log Find Settings Processes 2022-11-23-155224.term

File - + Pause Copy Paste Alert Settings Guide Help

```
/$ head -20 etc/passwd | tail +11
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
_apt:x:100:65534::/nonexistent:/usr/sbin/nologin
systemd-timesync:x:101:101:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologin
/$
```

### QN 14.

OS2 - CoCalc

cocalc.com/projects/ca1d15bb-5fba-4d5b-886a-57fec22fa4ab/files

Projects OS2

Free Trial (Day 8) – [buy a license](#) (starting at less than \$4/month) and then [apply it to this project](#).  
Otherwise, expect VERY bad performance (up to several times slower!) and you can't install packages, clone

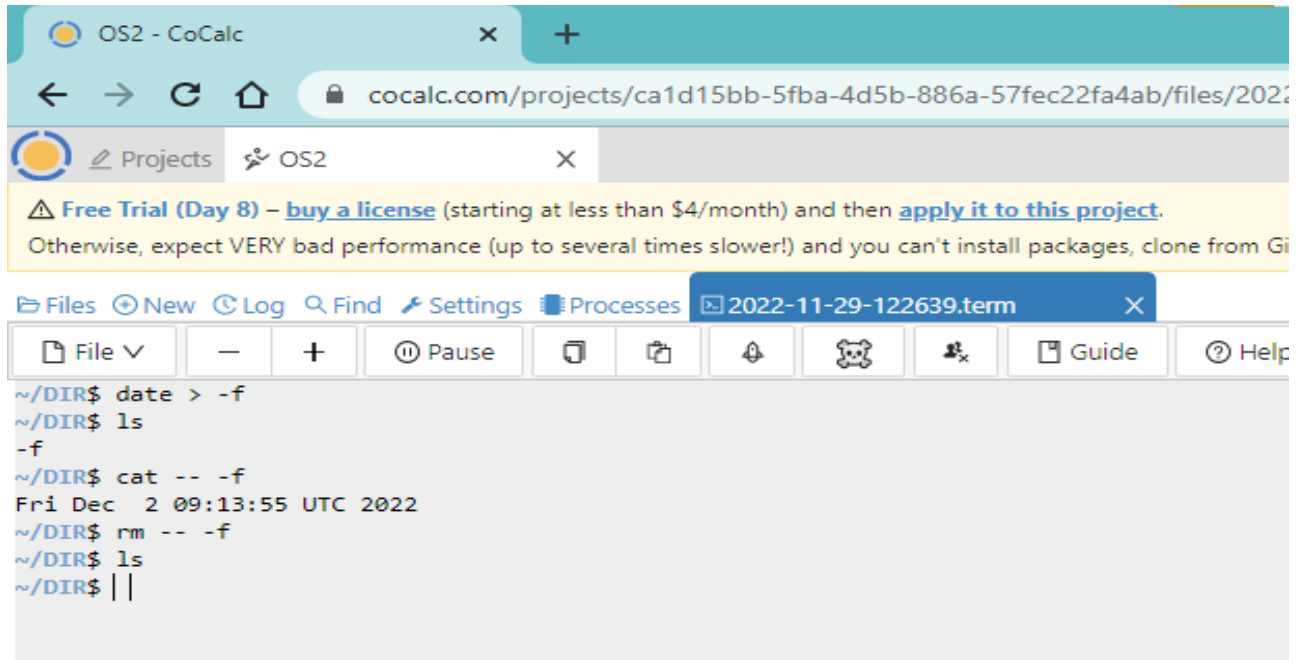
Files New Log Find Settings Processes 2022-11-29-122639.term

File - + Pause Copy Paste Alert Settings Guide

```
~/NEWDIR$ ls -al
total 7
drwxr-xr-x 4 user user 9 Dec 2 06:15 .
drwxr-xr-x 6 user user 16 Dec 2 09:04 ..
-rw-r--r-- 1 user user 0 Dec 2 06:12 .filr2.txt
-rw-r--r-- 1 user user 0 Dec 2 06:14 .temp
drwxr-xr-x 2 user user 3 Dec 2 06:13 SUB
drwxr-xr-x 2 user user 2 Dec 2 06:15 TEMP
-rw-r--r-- 1 user user 0 Dec 2 06:12 file1.text
-rw-r--r-- 1 user user 0 Dec 2 06:14 main.h
-rw-r--r-- 1 user user 0 Dec 2 06:14 money.sh
~/NEWDIR$ rm -rf ../
~/NEWDIR$ ls -al
total 0
~/NEWDIR$
```



QN 15.



OS2 - CoCalc

cocalc.com/projects/ca1d15bb-5fba-4d5b-886a-57fec22fa4ab/files/2022-

Projects OS2

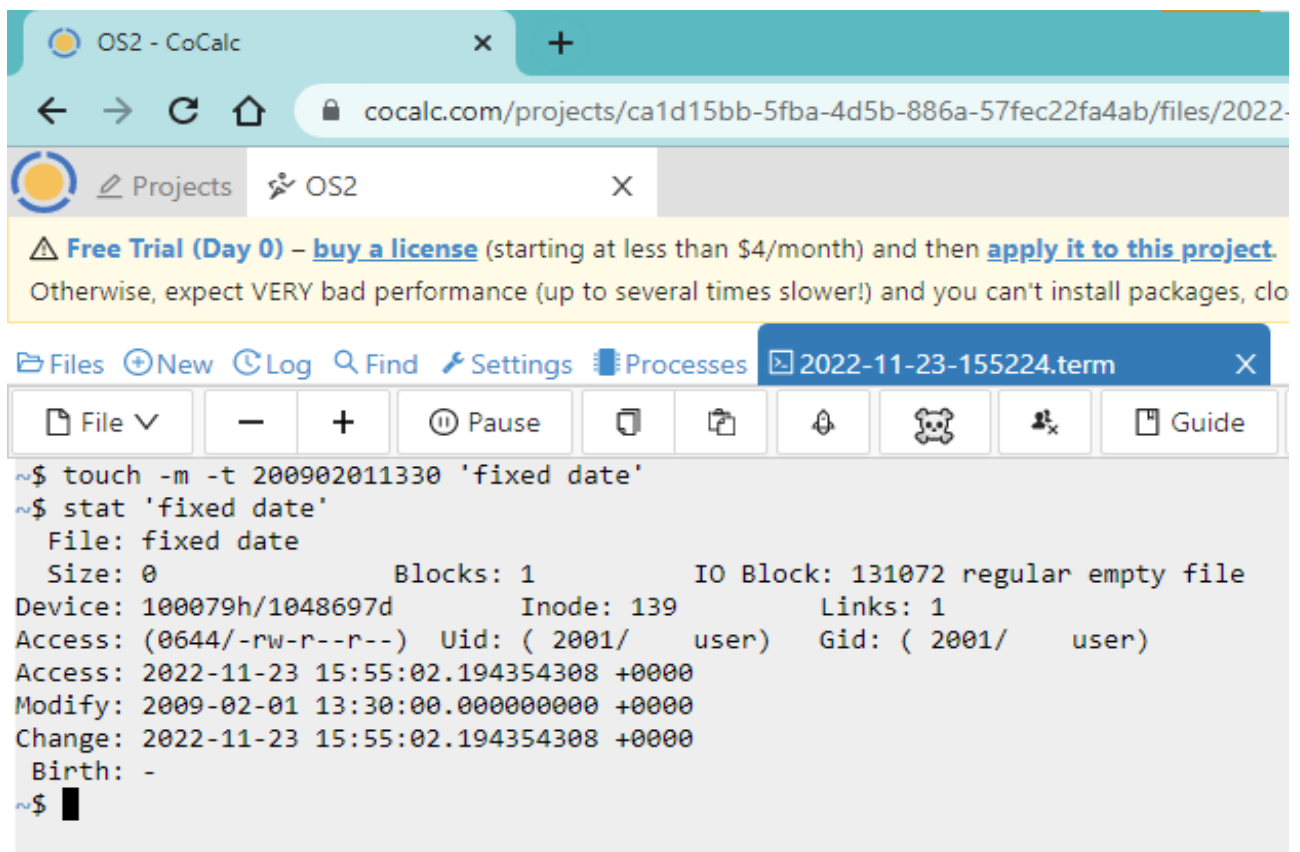
Free Trial (Day 8) – [buy a license](#) (starting at less than \$4/month) and then [apply it to this project](#). Otherwise, expect VERY bad performance (up to several times slower!) and you can't install packages, clone from Gi

Files New Log Find Settings Processes 2022-11-29-122639.term

File - + Pause [Icons] Guide Help

```
~/DIR$ date > -f
~/DIR$ ls
-f
~/DIR$ cat -- -f
Fri Dec 2 09:13:55 UTC 2022
~/DIR$ rm -- -f
~/DIR$ ls
~/DIR$ ||
```

QN 16.



OS2 - CoCalc

cocalc.com/projects/ca1d15bb-5fba-4d5b-886a-57fec22fa4ab/files/2022-

Projects OS2

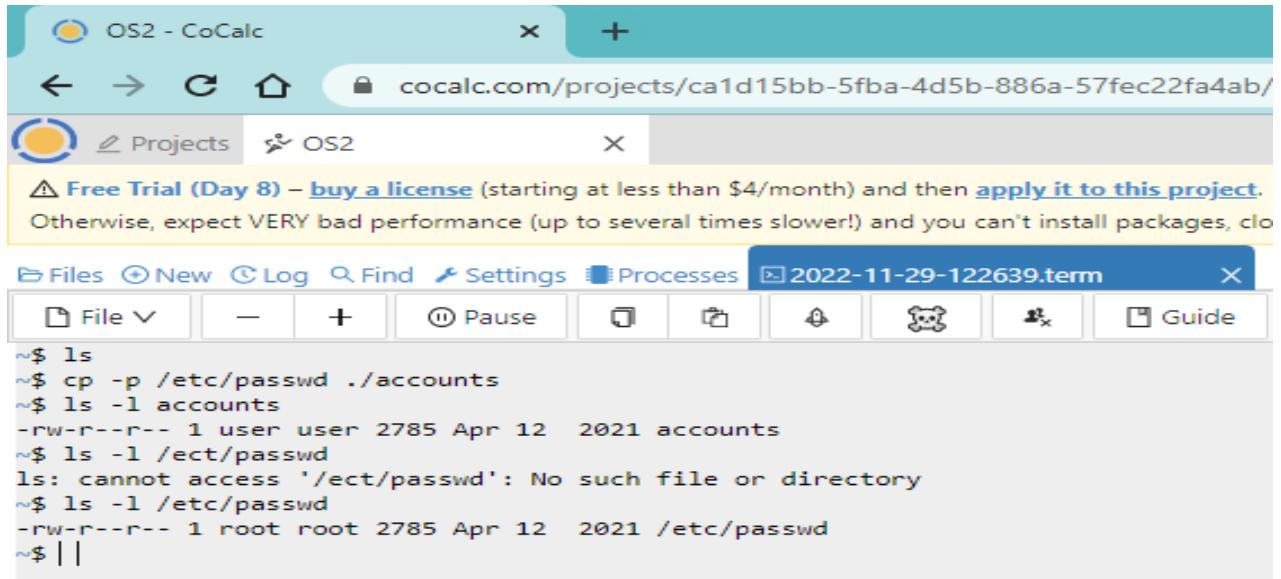
Free Trial (Day 0) – [buy a license](#) (starting at less than \$4/month) and then [apply it to this project](#). Otherwise, expect VERY bad performance (up to several times slower!) and you can't install packages, clo

Files New Log Find Settings Processes 2022-11-23-155224.term

File - + Pause [Icons] Guide

```
~$ touch -m -t 200902011330 'fixed date'
~$ stat 'fixed date'
  File: fixed date
  Size: 0          Blocks: 1          IO Block: 131072 regular empty file
Device: 100079h/1048697d    Inode: 139          Links: 1
Access: (0644/-rw-r--r--)  Uid: ( 2001/   user)   Gid: ( 2001/   user)
Access: 2022-11-23 15:55:02.194354308 +0000
Modify: 2009-02-01 13:30:00.000000000 +0000
Change: 2022-11-23 15:55:02.194354308 +0000
 Birth: -
~$ █
```

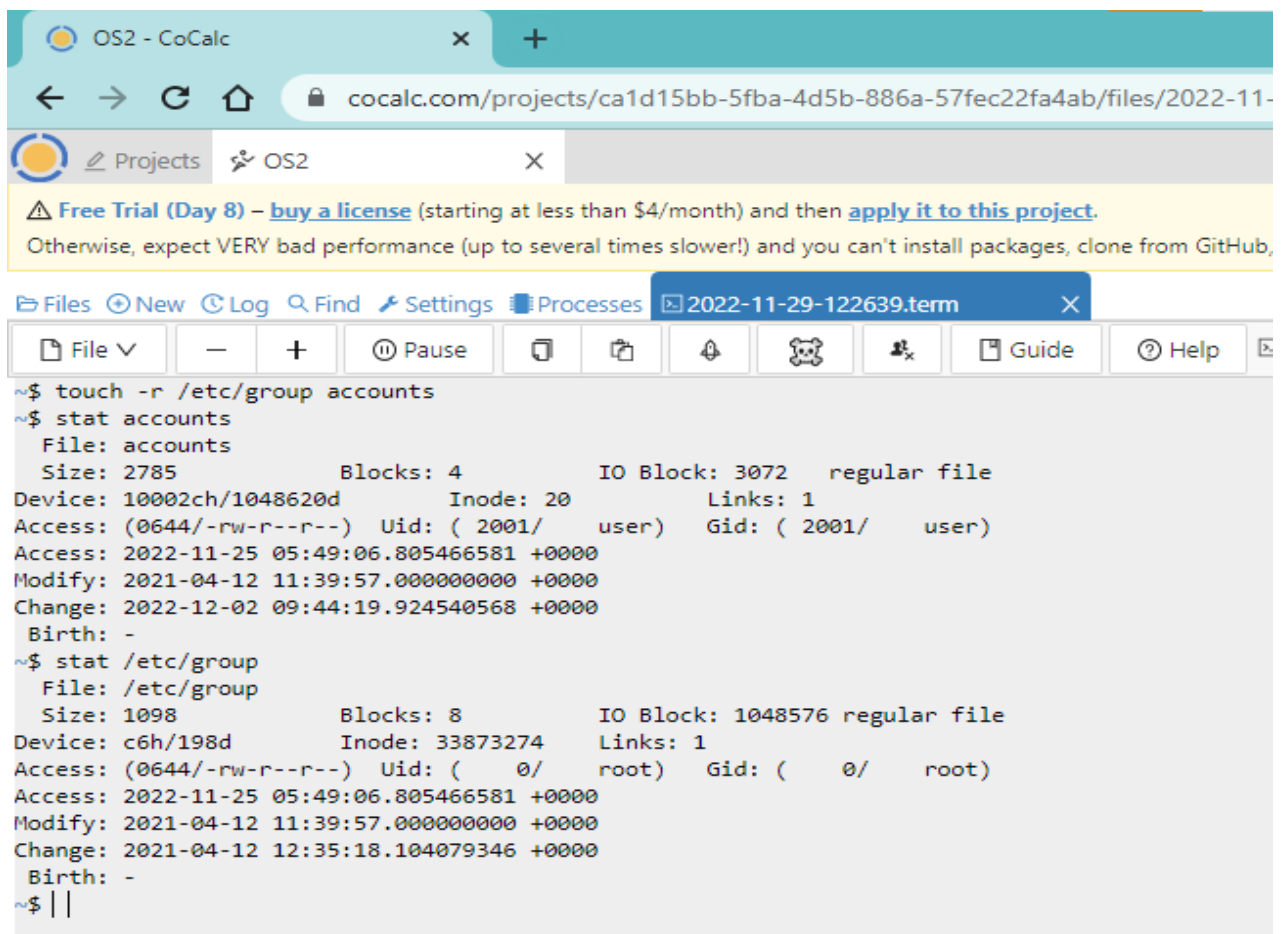
QN 17.



The screenshot shows the CoCalc web interface in a browser. The address bar displays the URL: `cocalc.com/projects/ca1d15bb-5fba-4d5b-886a-57fec22fa4ab/`. The interface includes a top navigation bar with 'Projects' and 'OS2' tabs. A yellow banner at the top contains a warning about a free trial and a link to buy a license. Below the banner is a menu bar with 'Files', 'New', 'Log', 'Find', 'Settings', 'Processes', and a terminal window titled '2022-11-29-122639.term'. The terminal window shows the following commands and output:

```
~$ ls
~$ cp -p /etc/passwd ./accounts
~$ ls -l accounts
-rw-r--r-- 1 user user 2785 Apr 12 2021 accounts
~$ ls -l /etc/passwd
ls: cannot access '/etc/passwd': No such file or directory
~$ ls -l /etc/passwd
-rw-r--r-- 1 root root 2785 Apr 12 2021 /etc/passwd
~$ ||
```

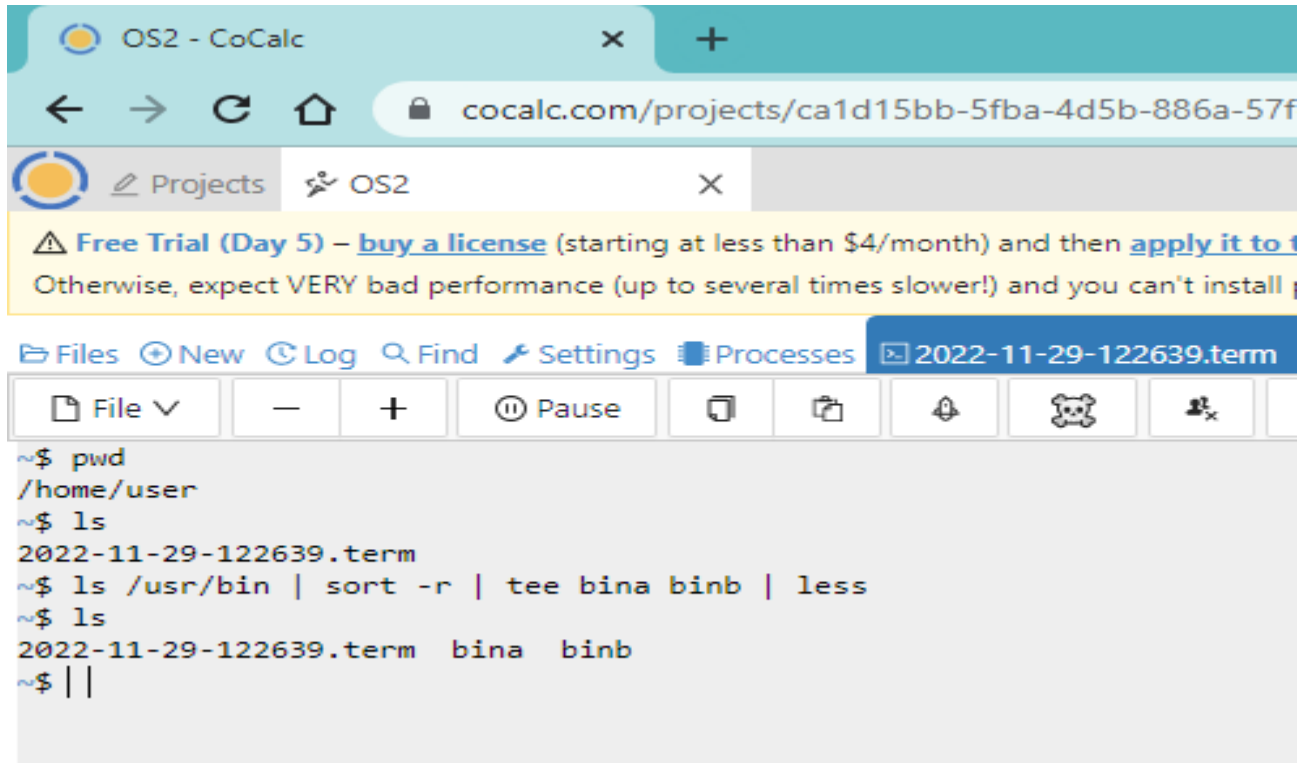
QN 18.



The screenshot shows the CoCalc web interface in a browser. The address bar displays the URL: `cocalc.com/projects/ca1d15bb-5fba-4d5b-886a-57fec22fa4ab/files/2022-11-`. The interface includes a top navigation bar with 'Projects' and 'OS2' tabs. A yellow banner at the top contains a warning about a free trial and a link to buy a license. Below the banner is a menu bar with 'Files', 'New', 'Log', 'Find', 'Settings', 'Processes', and a terminal window titled '2022-11-29-122639.term'. The terminal window shows the following commands and output:

```
~$ touch -r /etc/group accounts
~$ stat accounts
File: accounts
Size: 2785          Blocks: 4          IO Block: 3072   regular file
Device: 10002ch/1048620d    Inode: 20          Links: 1
Access: (0644/-rw-r--r--)  Uid: ( 2001/   user)   Gid: ( 2001/   user)
Access: 2022-11-25 05:49:06.805466581 +0000
Modify: 2021-04-12 11:39:57.000000000 +0000
Change: 2022-12-02 09:44:19.924540568 +0000
Birth: -
~$ stat /etc/group
File: /etc/group
Size: 1098          Blocks: 8          IO Block: 1048576 regular file
Device: c6h/198d    Inode: 33873274    Links: 1
Access: (0644/-rw-r--r--)  Uid: (    0/   root)   Gid: (    0/   root)
Access: 2022-11-25 05:49:06.805466581 +0000
Modify: 2021-04-12 11:39:57.000000000 +0000
Change: 2021-04-12 12:35:18.104079346 +0000
Birth: -
~$ ||
```

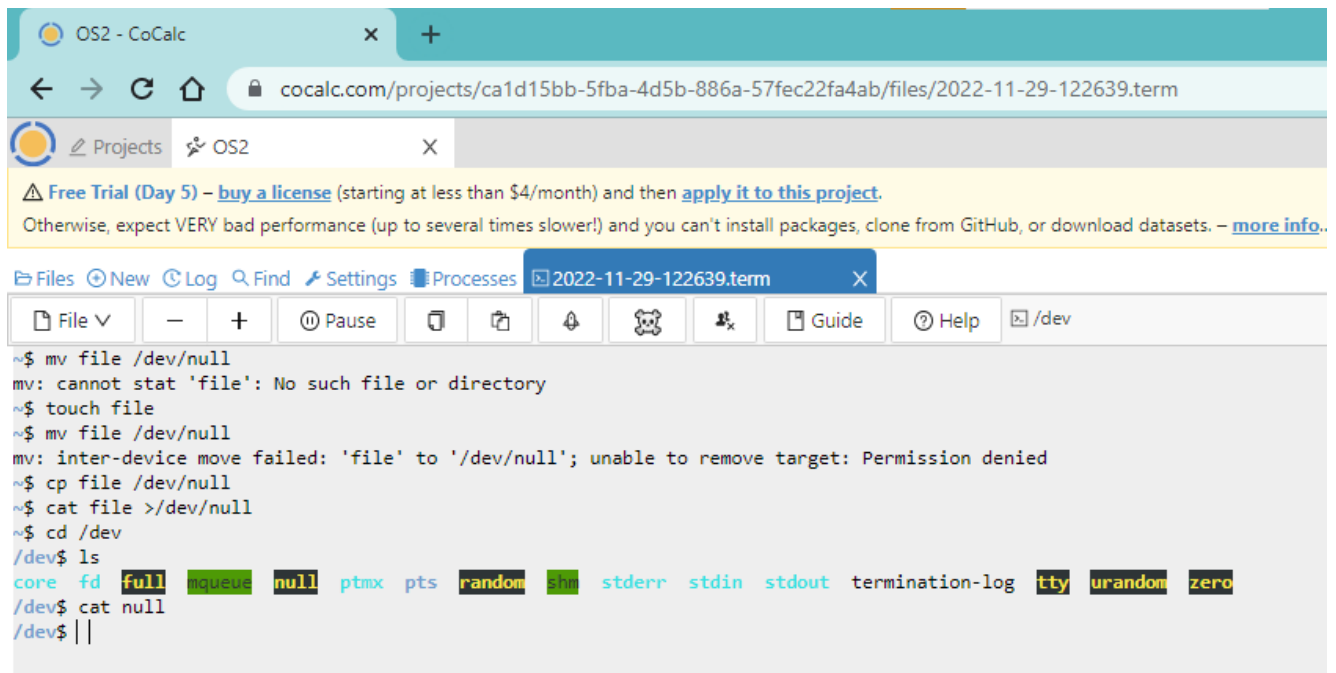
QN 19.



The screenshot shows the CoCalc web interface for a project named 'OS2'. The browser address bar shows 'cocalc.com/projects/ca1d15bb-5fba-4d5b-886a-57f...'. A yellow banner at the top contains a warning about a free trial and a link to buy a license. The terminal window shows the following commands and output:

```
~$ pwd
/home/user
~$ ls
2022-11-29-122639.term
~$ ls /usr/bin | sort -r | tee bina binb | less
~$ ls
2022-11-29-122639.term  bina  binb
~$ ||
```

QN 20.



The screenshot shows the CoCalc web interface for a project named 'OS2'. The browser address bar shows 'cocalc.com/projects/ca1d15bb-5fba-4d5b-886a-57fec22fa4ab/files/2022-11-29-122639.term'. A yellow banner at the top contains a warning about a free trial and a link to buy a license. The terminal window shows the following commands and output:

```
~$ mv file /dev/null
mv: cannot stat 'file': No such file or directory
~$ touch file
~$ mv file /dev/null
mv: inter-device move failed: 'file' to '/dev/null'; unable to remove target: Permission denied
~$ cp file /dev/null
~$ cat file >/dev/null
~$ cd /dev
/dev$ ls
core  fd  full  nqueue  null  ptmx  pts  random  shm  stderr  stdin  stdout  termination-log  tty  urandom  zero
/dev$ cat null
/dev$ ||
```

## What is happens during the execution of above commands?

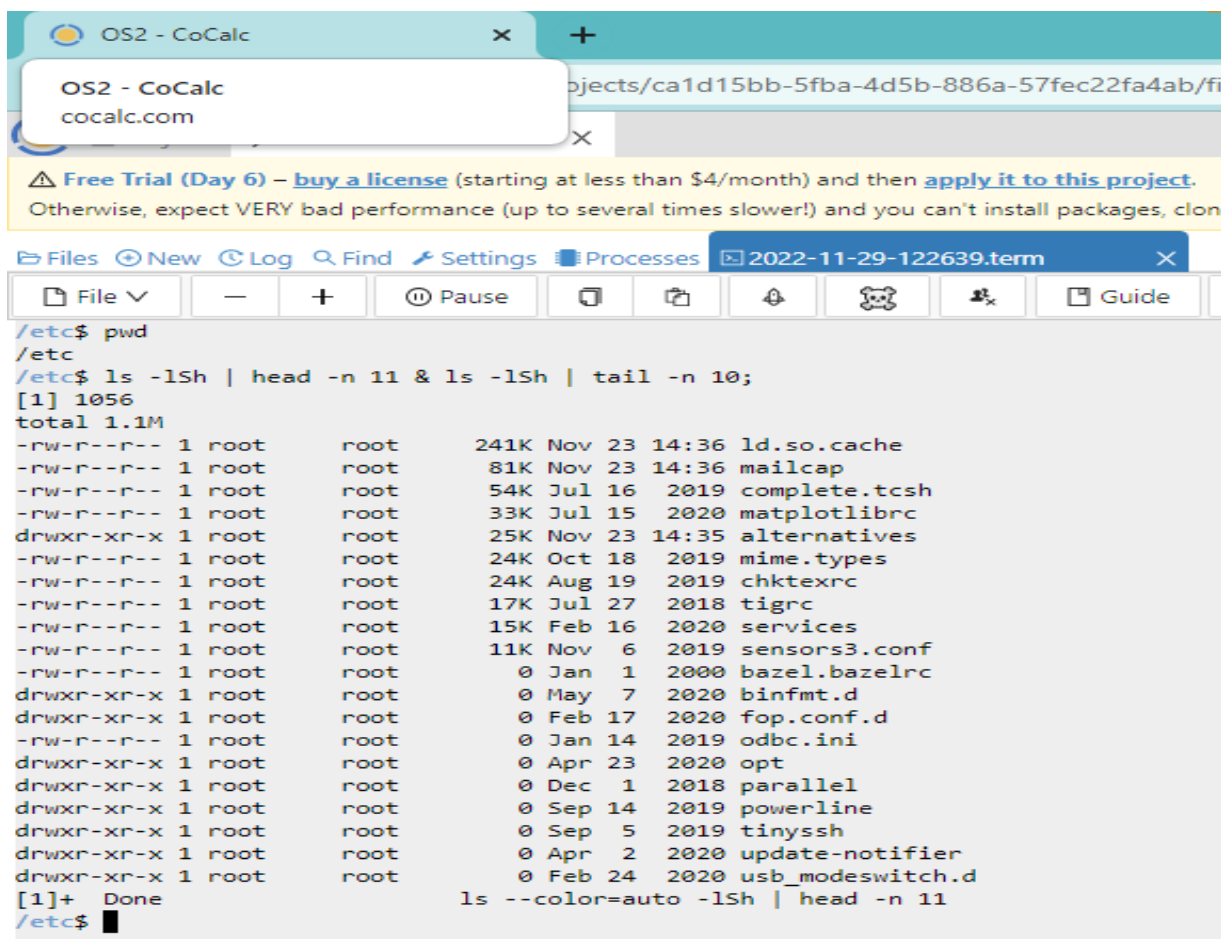
1. mv – we are discarding our file named "file", since the /dev/null in linux is void file that eats anything that fed into it also known as null device.
2. cp – here the file is being copied to /dev/null.
3. cat – the content of a file is copied to /dev/null.

### Whats the difference?

The difference is that, upon the execution of the first command the file is being discarded i.e sent to Linux null device, so technically we are sending our file into dump or void or bucket of nothingness which is the same as deleting the file.

**While** the 2<sup>nd</sup> command will copy the file into /dev/null but this time the file will not be deleted. 3<sup>rd</sup> command send the content of the file into /dev/null such that the content is being dumped or deleted, but again leaving the file unchanged.

## QN 21 –A



```
OS2 - CoCalc
cocalc.com
Free Trial (Day 6) – buy a license (starting at less than $4/month) and then apply it to this project.
Otherwise, expect VERY bad performance (up to several times slower!) and you can't install packages, clone
Files New Log Find Settings Processes 2022-11-29-122639.term
File - + Pause
/etc$ pwd
/etc
/etc$ ls -lSh | head -n 11 & ls -lSh | tail -n 10;
[1] 1056
total 1.1M
-rw-r--r-- 1 root root 241K Nov 23 14:36 ld.so.cache
-rw-r--r-- 1 root root 81K Nov 23 14:36 mailcap
-rw-r--r-- 1 root root 54K Jul 16 2019 complete.tcsh
-rw-r--r-- 1 root root 33K Jul 15 2020 matplotlibrc
drwxr-xr-x 1 root root 25K Nov 23 14:35 alternatives
-rw-r--r-- 1 root root 24K Oct 18 2019 mime.types
-rw-r--r-- 1 root root 24K Aug 19 2019 chktxrc
-rw-r--r-- 1 root root 17K Jul 27 2018 tigrc
-rw-r--r-- 1 root root 15K Feb 16 2020 services
-rw-r--r-- 1 root root 11K Nov 6 2019 sensors3.conf
-rw-r--r-- 1 root root 0 Jan 1 2000 bazel.bazelrc
drwxr-xr-x 1 root root 0 May 7 2020 binfmt.d
drwxr-xr-x 1 root root 0 Feb 17 2020 fop.conf.d
-rw-r--r-- 1 root root 0 Jan 14 2019 odbc.ini
drwxr-xr-x 1 root root 0 Apr 23 2020 opt
drwxr-xr-x 1 root root 0 Dec 1 2018 parallel
drwxr-xr-x 1 root root 0 Sep 14 2019 powerline
drwxr-xr-x 1 root root 0 Sep 5 2019 tinyssh
drwxr-xr-x 1 root root 0 Apr 2 2020 update-notifier
drwxr-xr-x 1 root root 0 Feb 24 2020 usb_modeswitch.d
[1]+ Done
/etc$
```

## QN 21 –B

