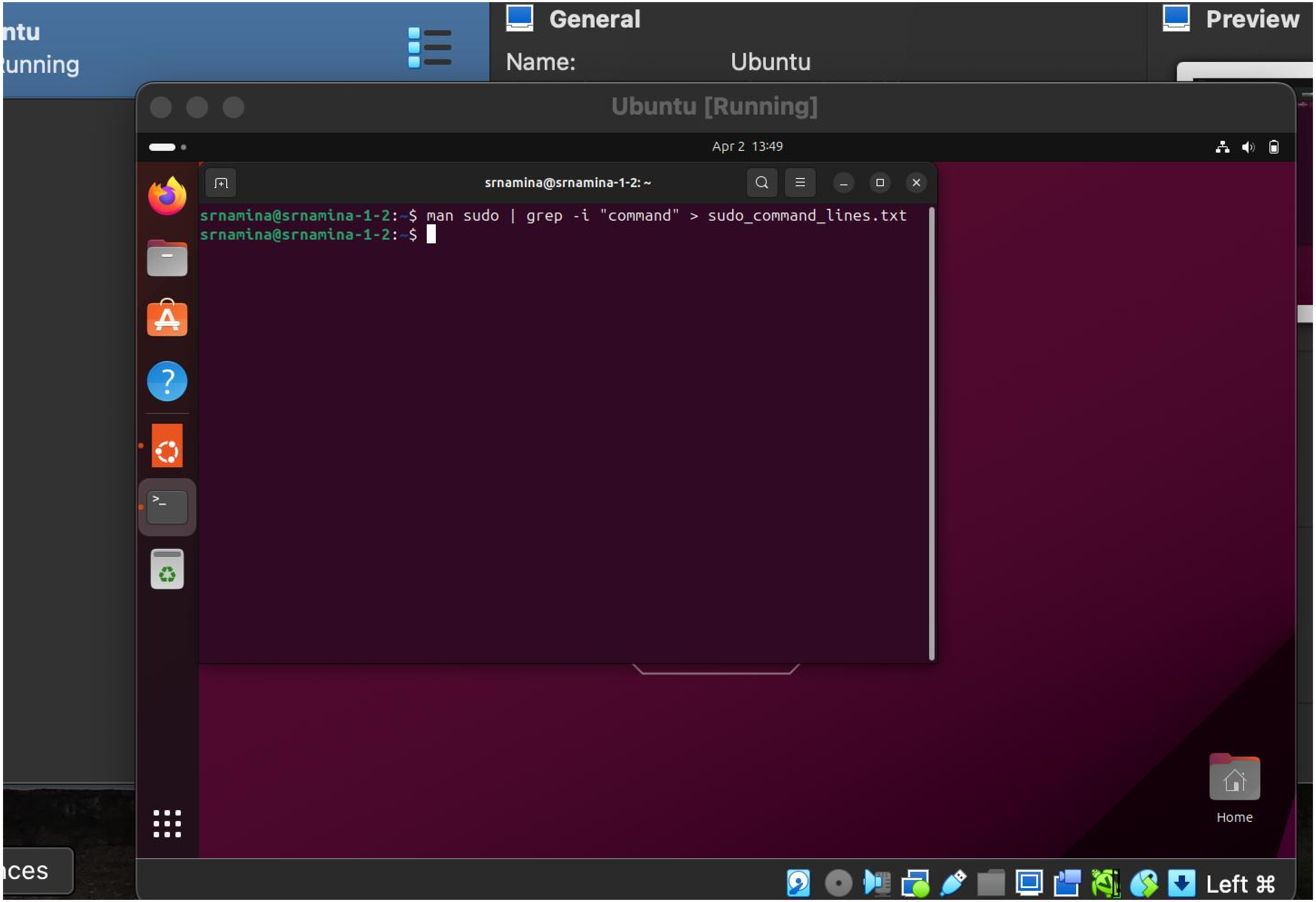
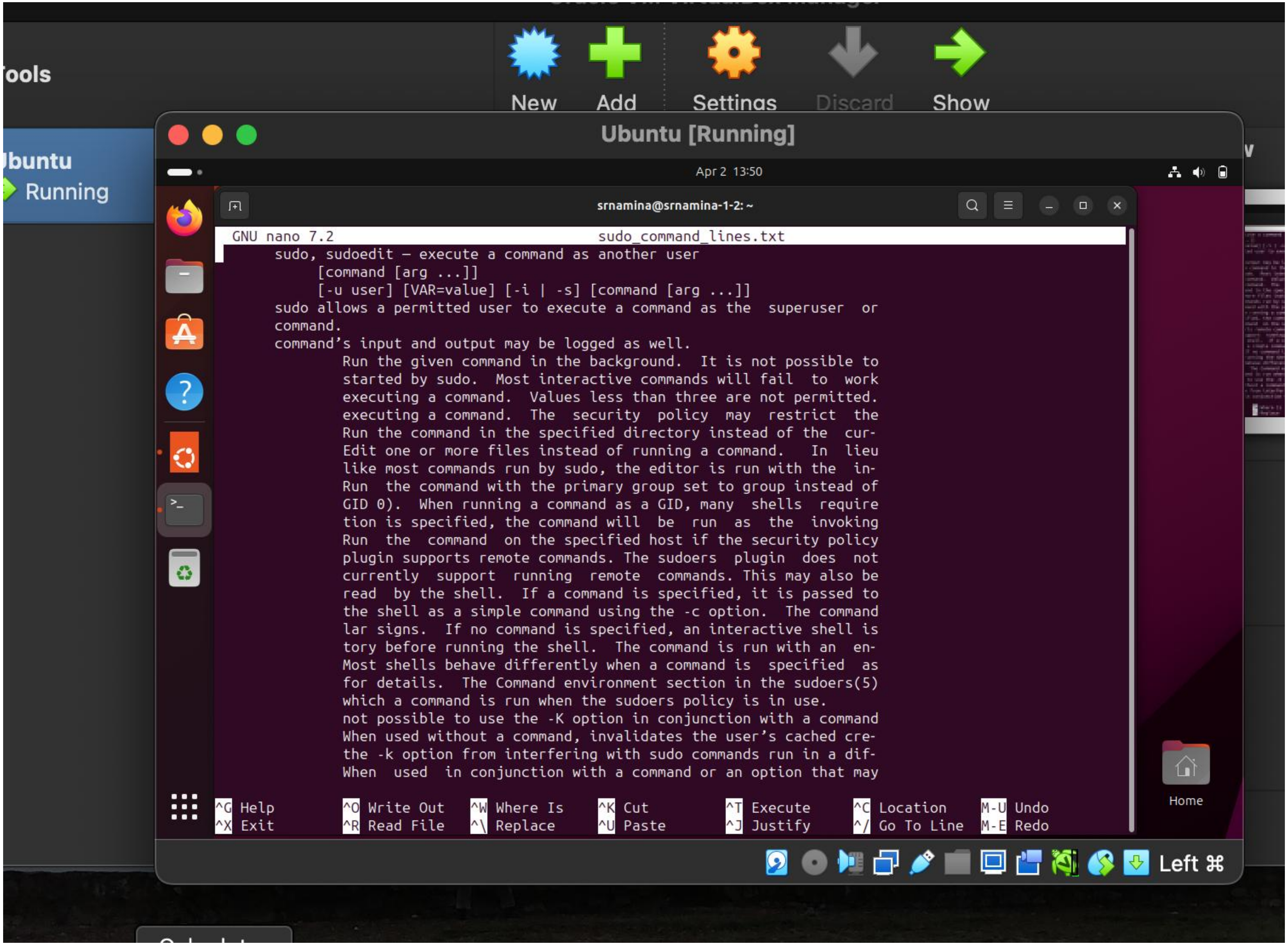
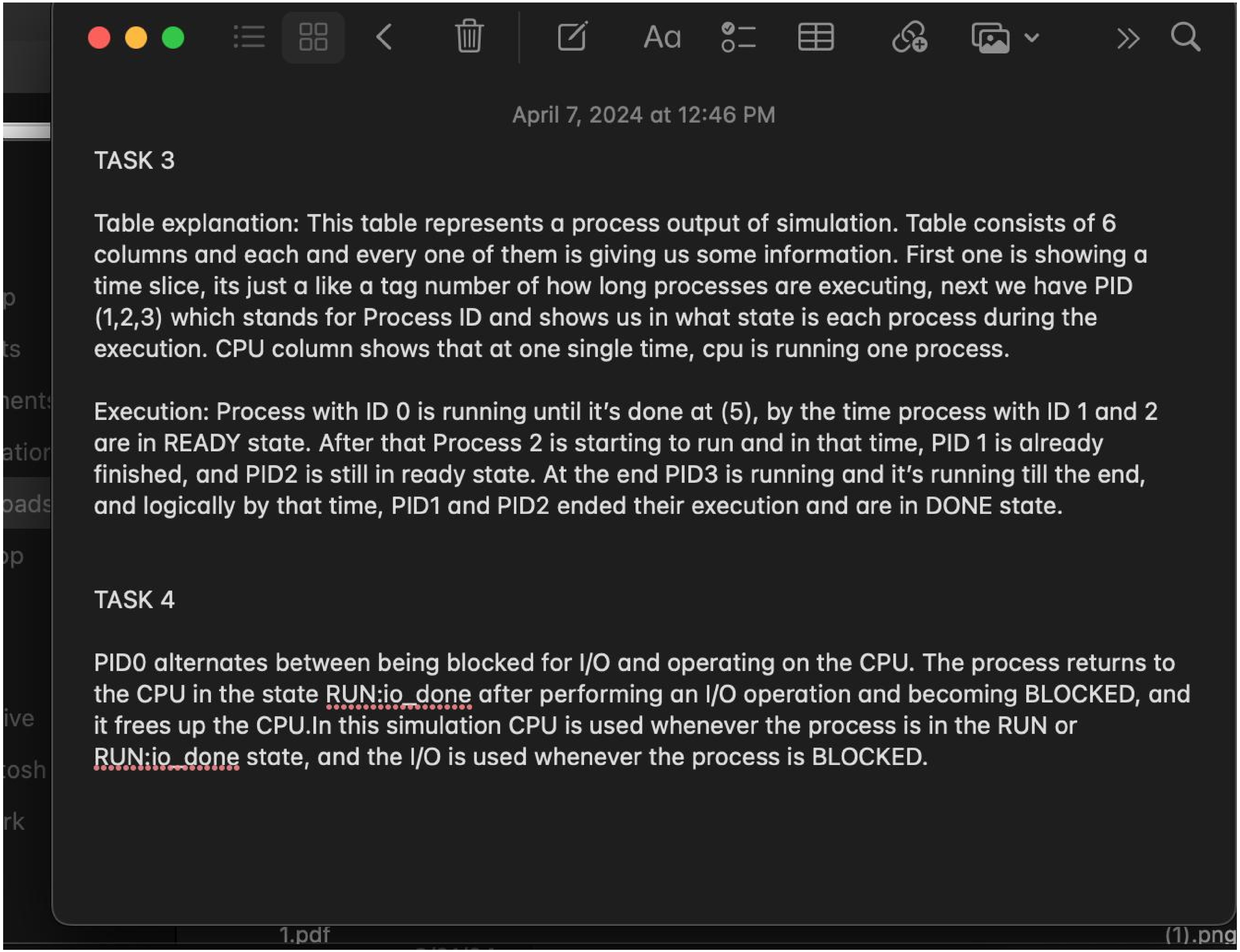


```
srnamina@srnamina-1-2:~$ man sudo | grep -i "command" > sudo_command_lines.txt
srnamina@srnamina-1-2:~$
```



```
GNU nano 7.2                              sudo_command_lines.txt
     sudo, sudoedit — execute a command as another user
          [command [arg ...]]
          [-u user] [VAR=value] [-i | -s] [command [arg ...]]
     sudo allows a permitted user to execute a command as the  superuser  or
     command.
     command’s input and output may be logged as well.
             Run the given command in the background.  It is not possible to
             started by sudo.  Most interactive commands will fail  to  work
             executing a command.  Values less than three are not permitted.
             executing a command.  The  security  policy  may  restrict  the
             Run the command in the specified directory instead of the  cur-
             Edit one or more files instead of running a command.  In  lieu
             like most commands run by sudo, the editor is run with the  in-
             Run  the command with the primary group set to group instead of
             GID 0).  When running a command as a GID, many  shells  require
             tion is specified, the command will  be  run  as  the  invoking
             Run  the  command  on the specified host if the security policy
             plugin supports remote commands. The sudoers  plugin  does  not
             currently  support  running  remote  commands. This may also be
             read  by the shell.  If a command is specified, it is passed to
             the shell as a simple command using the -c option.  The command
             lar signs.  If no command is specified, an interactive shell is
             tory before running the shell.  The command is run with an  en-
             Most shells behave differently when a command is  specified  as
             for details.  The Command environment section in the sudoers(5)
             which a command is run when the sudoers policy is in use.
             not possible to use the -K option in conjunction with a command
             When used without a command, invalidates the user’s cached cre-
             the -k option from interfering with sudo commands run in a dif-
             When  used  in conjunction with a command or an option that may

^G Help       ^O Write Out  ^W Where Is   ^K Cut        ^T Execute    ^C Location   M-U Undo
^X Exit       ^R Read File  ^\ Replace    ^U Paste      ^J Justify    ^/ Go To Line M-E Redo
```


April 7, 2024 at 12:46 PM

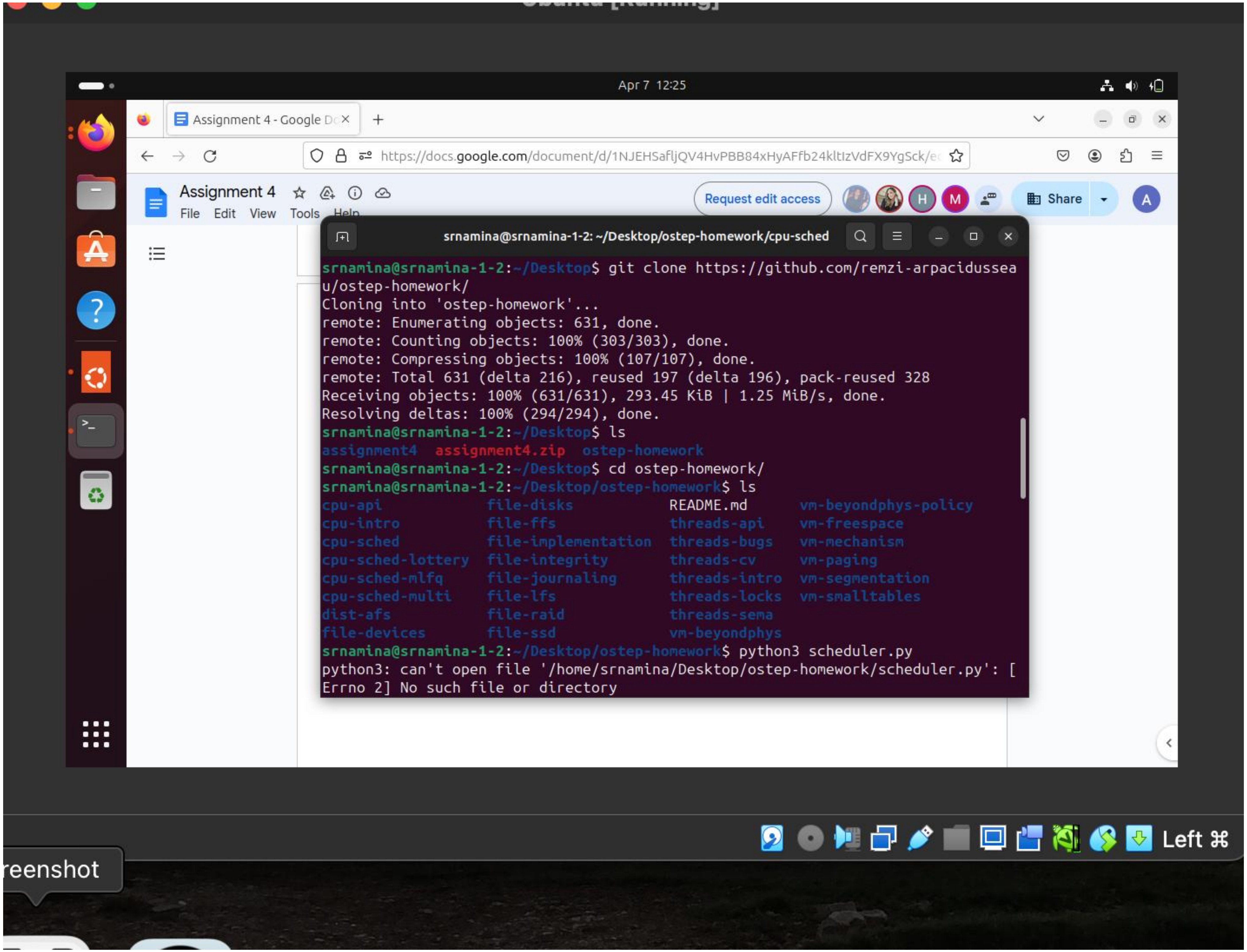
TASK 3

Table explanation: This table represents a process output of simulation. Table consists of 6 columns and each and every one of them is giving us some information. First one is showing a time slice, its just a like a tag number of how long processes are executing, next we have PID (1,2,3) which stands for Process ID and shows us in what state is each process during the execution. CPU column shows that at one single time, cpu is running one process.

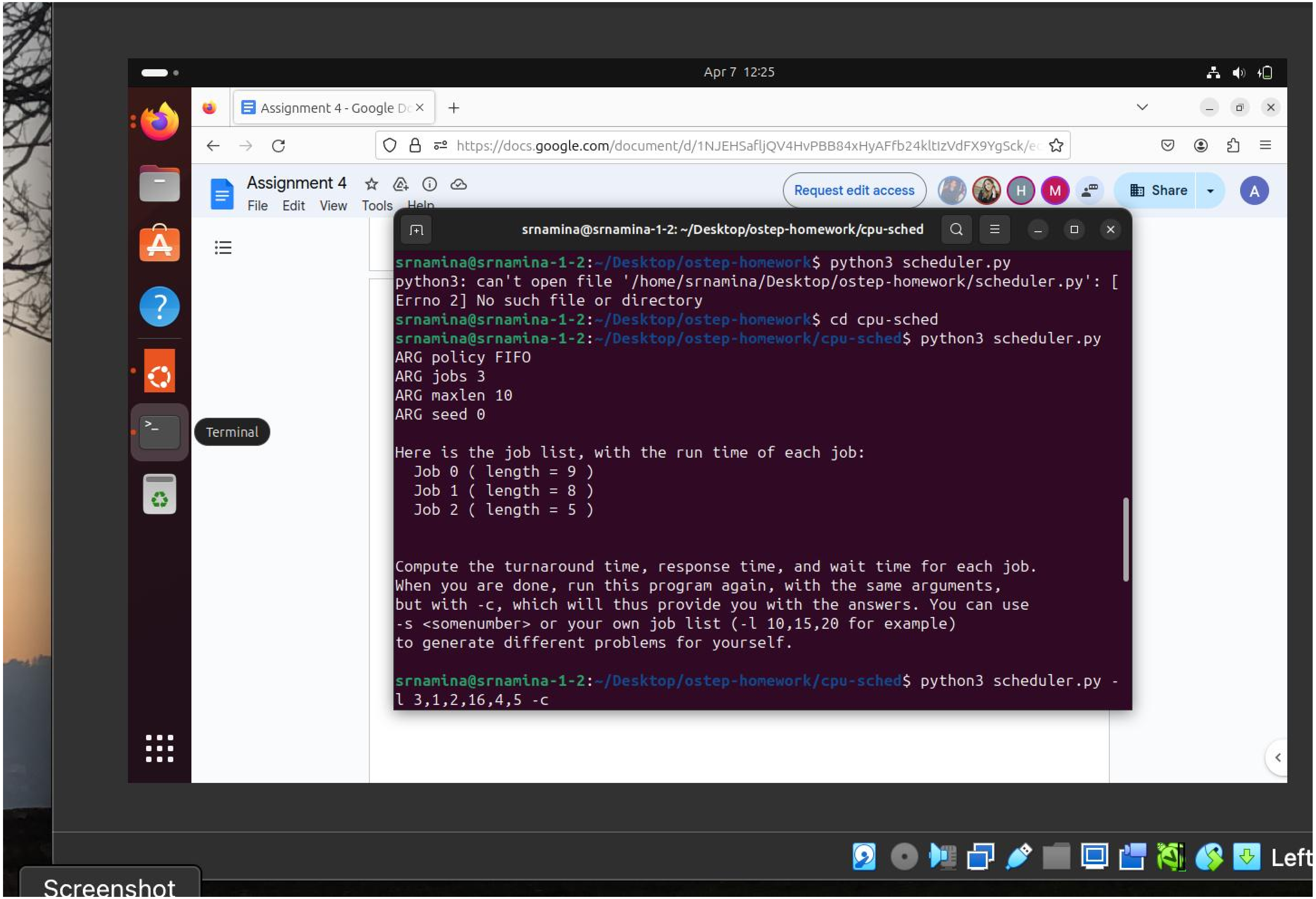
Execution: Process with ID 0 is running until it’s done at (5), by the time process with ID 1 and 2 are in READY state. After that Process 2 is starting to run and in that time, PID 1 is already finished, and PID2 is still in ready state. At the end PID3 is running and it’s running till the end, and logically by that time, PID1 and PID2 ended their execution and are in DONE state.

TASK 4

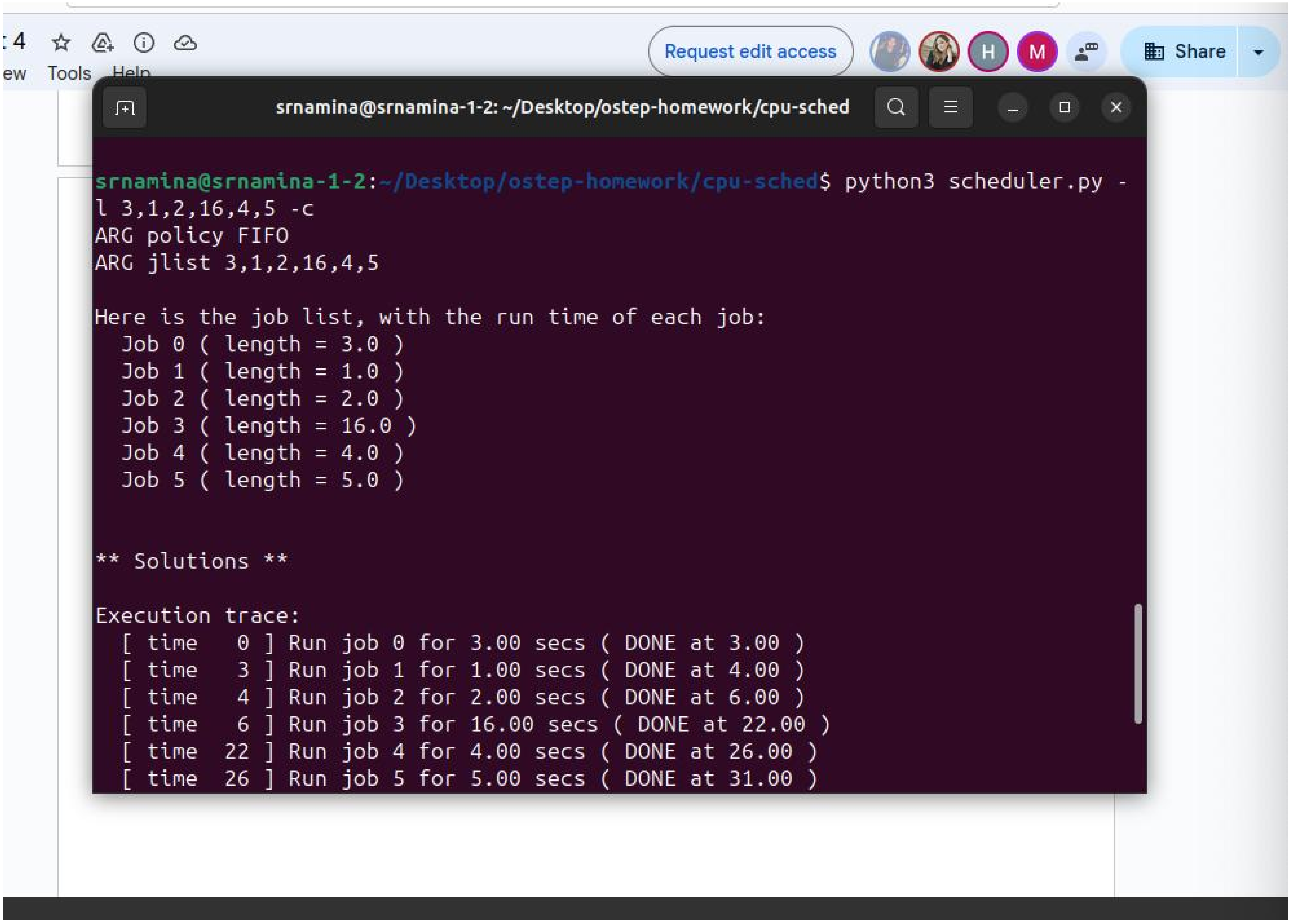
PID0 alternates between being blocked for I/O and operating on the CPU. The process returns to the CPU in the state RUN:io_done after performing an I/O operation and becoming BLOCKED, and it frees up the CPU.In this simulation CPU is used whenever the process is in the RUN or RUN:io_done state, and the I/O is used whenever the process is BLOCKED.


Apr 7 12:25
Assignment 4 - Google Dc
https://docs.google.com/document/d/1NJEHSafljQV4HvPBB84xHyAFfb24kltIzVdFX9YgSck/e
Assignment 4
File Edit View Tools Help
Request edit access
Share
srnamina@srnamina-1-2: ~/Desktop/ostep-homework/cpu-sched
Left ⌘
reenshot

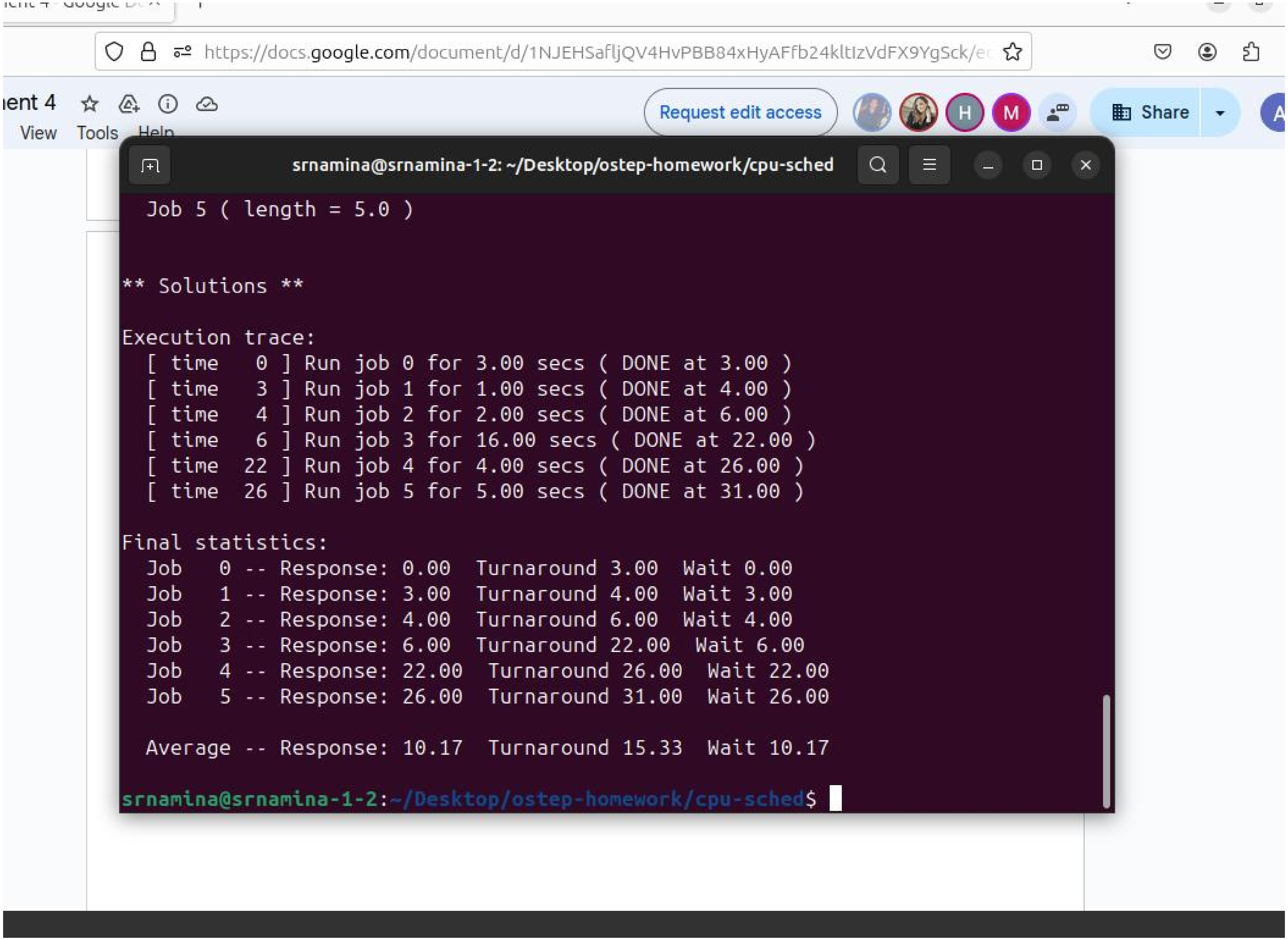
```
srnamina@srnamina-1-2:~/Desktop$ git clone https://github.com/remzi-arpacidussea
u/ostep-homework/
Cloning into 'ostep-homework'...
remote: Enumerating objects: 631, done.
remote: Counting objects: 100% (303/303), done.
remote: Compressing objects: 100% (107/107), done.
remote: Total 631 (delta 216), reused 197 (delta 196), pack-reused 328
Receiving objects: 100% (631/631), 293.45 KiB | 1.25 MiB/s, done.
Resolving deltas: 100% (294/294), done.
srnamina@srnamina-1-2:~/Desktop$ ls
assignment4  assignment4.zip  ostep-homework
srnamina@srnamina-1-2:~/Desktop$ cd ostep-homework/
srnamina@srnamina-1-2:~/Desktop/ostep-homework$ ls
cpu-api            file-disks           README.md      vm-beyondphys-policy
cpu-intro          file-ffs             threads-api    vm-freespace
cpu-sched          file-implementation  threads-bugs   vm-mechanism
cpu-sched-lottery  file-integrity       threads-cv     vm-paging
cpu-sched-mlfq     file-journaling      threads-intro  vm-segmentation
cpu-sched-multi    file-lfs             threads-locks  vm-smalltables
dist-afs           file-raid            threads-sema
file-devices       file-ssd             vm-beyondphys
srnamina@srnamina-1-2:~/Desktop/ostep-homework$ python3 scheduler.py
python3: can't open file '/home/srnamina/Desktop/ostep-homework/scheduler.py': [
Errno 2] No such file or directory
```


Apr 7 12:25
Assignment 4 - Google Dc
https://docs.google.com/document/d/1NJEHSafljQV4HvPBB84xHyAFfb24kltIzVdFX9YgSck/e
Assignment 4
File Edit View Tools Help
Request edit access
Share
Terminal
srnamina@srnamina-1-2: ~/Desktop/ostep-homework/cpu-sched
Left
Screenshot

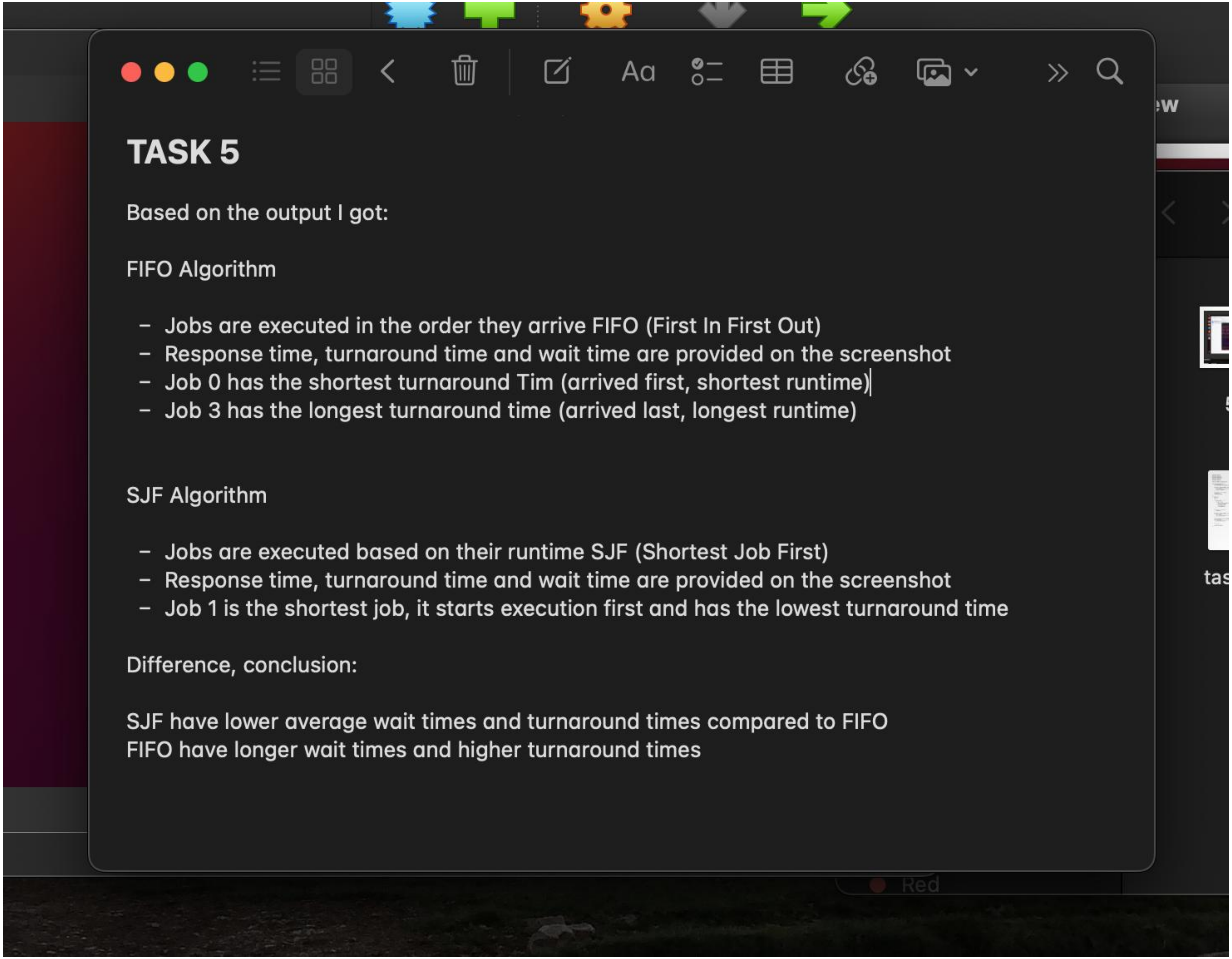
```
srnamina@srnamina-1-2:~/Desktop/ostep-homework$ python3 scheduler.py
python3: can't open file '/home/srnamina/Desktop/ostep-homework/scheduler.py': [
Errno 2] No such file or directory
srnamina@srnamina-1-2:~/Desktop/ostep-homework$ cd cpu-sched
srnamina@srnamina-1-2:~/Desktop/ostep-homework/cpu-sched$ python3 scheduler.py
ARG policy FIFO
ARG jobs 3
ARG maxlen 10
ARG seed 0

Here is the job list, with the run time of each job:
  Job 0 ( length = 9 )
  Job 1 ( length = 8 )
  Job 2 ( length = 5 )


Compute the turnaround time, response time, and wait time for each job.
When you are done, run this program again, with the same arguments,
but with -c, which will thus provide you with the answers. You can use
-s <somenumber> or your own job list (-l 10,15,20 for example)
to generate different problems for yourself.

srnamina@srnamina-1-2:~/Desktop/ostep-homework/cpu-sched$ python3 scheduler.py -
l 3,1,2,16,4,5 -c
```



```
srnamina@srnamina-1-2:~/Desktop/ostep-homework/cpu-sched$ python3 scheduler.py -
l 3,1,2,16,4,5 -c
ARG policy FIFO
ARG jlist 3,1,2,16,4,5

Here is the job list, with the run time of each job:
  Job 0 ( length = 3.0 )
  Job 1 ( length = 1.0 )
  Job 2 ( length = 2.0 )
  Job 3 ( length = 16.0 )
  Job 4 ( length = 4.0 )
  Job 5 ( length = 5.0 )


** Solutions **

Execution trace:
  [ time   0 ] Run job 0 for 3.00 secs ( DONE at 3.00 )
  [ time   3 ] Run job 1 for 1.00 secs ( DONE at 4.00 )
  [ time   4 ] Run job 2 for 2.00 secs ( DONE at 6.00 )
  [ time   6 ] Run job 3 for 16.00 secs ( DONE at 22.00 )
  [ time  22 ] Run job 4 for 4.00 secs ( DONE at 26.00 )
  [ time  26 ] Run job 5 for 5.00 secs ( DONE at 31.00 )
```


https://docs.google.com/document/d/1NJEHSafljQV4HvPBB84xHyAFfb24kltIzVdFX9YgSck/e
ent 4
View
Tools
Help
Request edit access
Share
srnamina@srnamina-1-2: ~/Desktop/ostep-homework/cpu-sched

```
  Job 5 ( length = 5.0 )


** Solutions **

Execution trace:
  [ time   0 ] Run job 0 for 3.00 secs ( DONE at 3.00 )
  [ time   3 ] Run job 1 for 1.00 secs ( DONE at 4.00 )
  [ time   4 ] Run job 2 for 2.00 secs ( DONE at 6.00 )
  [ time   6 ] Run job 3 for 16.00 secs ( DONE at 22.00 )
  [ time  22 ] Run job 4 for 4.00 secs ( DONE at 26.00 )
  [ time  26 ] Run job 5 for 5.00 secs ( DONE at 31.00 )

Final statistics:
  Job   0 -- Response: 0.00  Turnaround 3.00  Wait 0.00
  Job   1 -- Response: 3.00  Turnaround 4.00  Wait 3.00
  Job   2 -- Response: 4.00  Turnaround 6.00  Wait 4.00
  Job   3 -- Response: 6.00  Turnaround 22.00  Wait 6.00
  Job   4 -- Response: 22.00  Turnaround 26.00  Wait 22.00
  Job   5 -- Response: 26.00  Turnaround 31.00  Wait 26.00

  Average -- Response: 10.17  Turnaround 15.33  Wait 10.17

srnamina@srnamina-1-2:~/Desktop/ostep-homework/cpu-sched$
```



TASK 5

Based on the output I got:

FIFO Algorithm

- Jobs are executed in the order they arrive FIFO (First In First Out)
- Response time, turnaround time and wait time are provided on the screenshot
- Job 0 has the shortest turnaround Tim (arrived first, shortest runtime)
- Job 3 has the longest turnaround time (arrived last, longest runtime)

SJF Algorithm

- Jobs are executed based on their runtime SJF (Shortest Job First)
- Response time, turnaround time and wait time are provided on the screenshot
- Job 1 is the shortest job, it starts execution first and has the lowest turnaround time

Difference, conclusion:

SJF have lower average wait times and turnaround times compared to FIFO
FIFO have longer wait times and higher turnaround times