UNIVERSIDAD AUTONOMA

DEL ESTADO DE MEXICO

KARLA ZARET VAZQUEZ LEDO

TRABAJO EN CLASE:

COMANDOS DE HOY

09/10/2025

SISTEMAS OPERATIVOS

7MO SEMESTRE

```
1940  top
1941  top
1942  clear
1943  ps
1944  ps -e
1945  ps -u
1946  ps -u root
1947  ps -o
1948  ps -o s
1949  ps -o l
1950  ps -l
1951  ps -t
1952  ps -m
1953  ps -a
1954  ps -x
1955  ps -aux
1956  ps -forest
1957  pstree
1958  clear
1959  vmstat
1960  vmstat -a
1961  vmstat -f
1962  vmstat -d
1963  vmstat -n
1964  vmstat 2
1965  vmstat 1
1966  vmstat 5
1967  vmstat -s
1968  clear
1969  free
1970  free -s 2
1971  free c 3
1972  free -c 2
1973  free -c 3
1974  free -c 1
1975  free -t
1976  free -l
1977  clear
1978  df
1979  df -h
1980  df -i
```

```
1981  df -n
1982  df -m
1983  df -T
1984  df -T ht/home
1985  clear
1986  du /home
1987  pwd
1988  cd ..
1989  pwd
1990  clear
1991  ls -l
1992  du /home
1993  du -h
1994  du -i
1995  df -i
1996  du -h /home
1997  du -sh /home
1998  du -m /home
1999  du -k /home
2000  du -all
2001  clear
2002  cat/etc/shells
2003  cat /etc/shells
2004  which bash
2005  su root
2006  which bash
2007  sudo su
2008  sudo nano primer.sh
2009  ls -l
2010  sudo chmod +x primer.sh
2011  ls -l
2012  ./primer.sh
2013  nano primer.sh
2014  sudo nano primer.sh
2015  ./primer.sh
2016  clear
2017  sudo nano actualizar.sh
2018  sudo chmod +x actualizar.sh
2019  ./actualizar.sh
2020  history
karli@KARLA:/home$
```
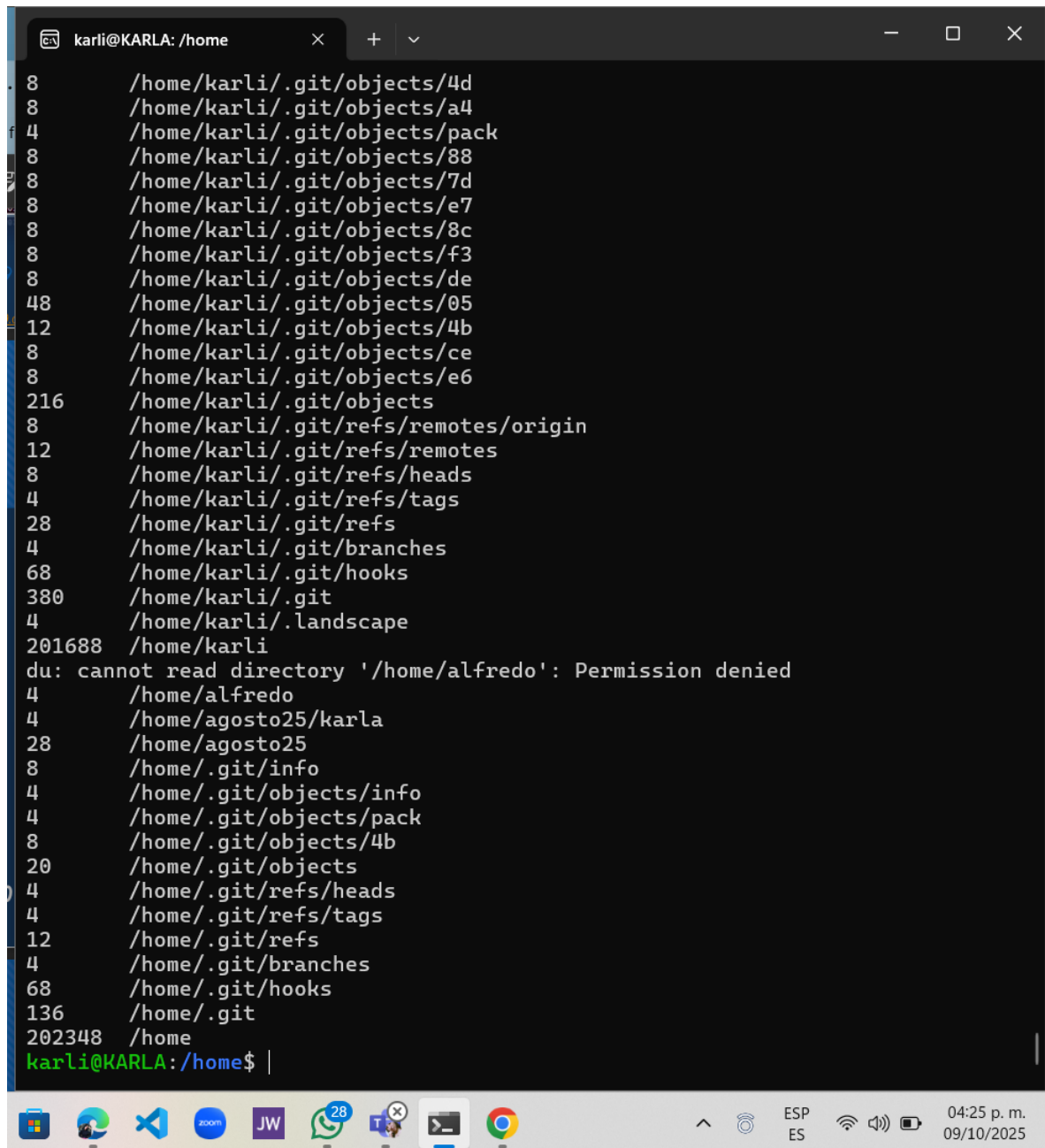
```
4       ./agosto25/ventiuno.txt
4       ./agosto25/karla
4       ./agosto25/ubuntu.txt
4       ./agosto25/veintiuno.txt
4       ./agosto25/so.txt
4       ./agosto25/linux.txt
28      ./agosto25
4       ././.git/COMMIT_EDITMSG
4       ././.git/info/exclude
8       ././.git/info
4       ././.git/objects/info
4       ././.git/objects/pack
4       ././.git/objects/4b/825dc642cb6eb9a060e54bf8d69288fbee4904
8       ././.git/objects/4b
20      ././.git/objects
4       ././.git/config
4       ././.git/HEAD
4       ././.git/refs/heads
4       ././.git/refs/tags
12      ././.git/refs
4       ././.git/branches
4       ././.git/description
4       ././.git/hooks/pre-receive.sample
4       ././.git/hooks/prepare-commit-msg.sample
4       ././.git/hooks/update.sample
4       ././.git/hooks/pre-merge-commit.sample
8       ././.git/hooks/pre-rebase.sample
4       ././.git/hooks/pre-push.sample
4       ././.git/hooks/pre-applypatch.sample
4       ././.git/hooks/sendemail-validate.sample
4       ././.git/hooks/push-to-checkout.sample
4       ././.git/hooks/post-update.sample
8       ././.git/hooks/fsmonitor-watchman.sample
4       ././.git/hooks/commit-msg.sample
4       ././.git/hooks/applypatch-msg.sample
4       ././.git/hooks/pre-commit.sample
68      ././.git/hooks
4       ././.git/index
136     ././.git
202348  .
karli@KARLA:/home$
```
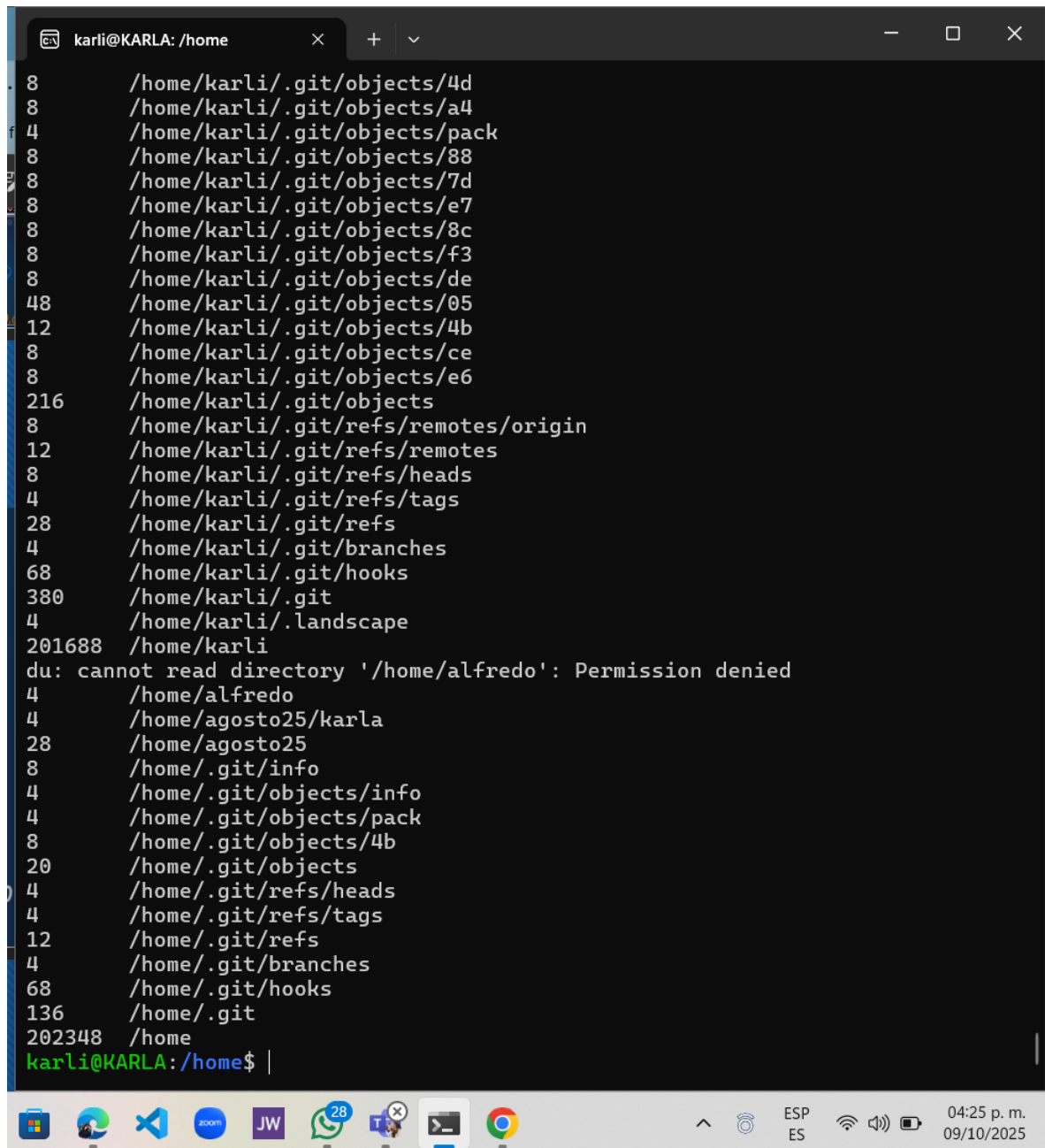
```
8          /home/karli/.git/objects/4d
8          /home/karli/.git/objects/a4
4          /home/karli/.git/objects/pack
8          /home/karli/.git/objects/88
8          /home/karli/.git/objects/7d
8          /home/karli/.git/objects/e7
8          /home/karli/.git/objects/8c
8          /home/karli/.git/objects/f3
8          /home/karli/.git/objects/de
48         /home/karli/.git/objects/05
12         /home/karli/.git/objects/4b
8          /home/karli/.git/objects/ce
8          /home/karli/.git/objects/e6
216        /home/karli/.git/objects
8          /home/karli/.git/refs/remotes/origin
12         /home/karli/.git/refs/remotes
8          /home/karli/.git/refs/heads
4          /home/karli/.git/refs/tags
28         /home/karli/.git/refs
4          /home/karli/.git/branches
68         /home/karli/.git/hooks
380        /home/karli/.git
4          /home/karli/.landscape
201688     /home/karli
du: cannot read directory '/home/alfredo': Permission denied
4          /home/alfredo
4          /home/agosto25/karla
28         /home/agosto25
8          /home/.git/info
4          /home/.git/objects/info
4          /home/.git/objects/pack
8          /home/.git/objects/4b
20         /home/.git/objects
4          /home/.git/refs/heads
4          /home/.git/refs/tags
12         /home/.git/refs
4          /home/.git/branches
68         /home/.git/hooks
136        /home/.git
202348     /home
karli@KARLA:/home$
```

```
8          /home/karli/.git/objects/4d
8          /home/karli/.git/objects/a4
4          /home/karli/.git/objects/pack
8          /home/karli/.git/objects/88
8          /home/karli/.git/objects/7d
8          /home/karli/.git/objects/e7
8          /home/karli/.git/objects/8c
8          /home/karli/.git/objects/f3
8          /home/karli/.git/objects/de
48         /home/karli/.git/objects/05
12         /home/karli/.git/objects/4b
8          /home/karli/.git/objects/ce
8          /home/karli/.git/objects/e6
216        /home/karli/.git/objects
8          /home/karli/.git/refs/remotes/origin
12         /home/karli/.git/refs/remotes
8          /home/karli/.git/refs/heads
4          /home/karli/.git/refs/tags
28         /home/karli/.git/refs
4          /home/karli/.git/branches
68         /home/karli/.git/hooks
380        /home/karli/.git
4          /home/karli/.landscape
201688     /home/karli
du: cannot read directory '/home/alfredo': Permission denied
4          /home/alfredo
4          /home/agosto25/karla
28         /home/agosto25
8          /home/.git/info
4          /home/.git/objects/info
4          /home/.git/objects/pack
8          /home/.git/objects/4b
20         /home/.git/objects
4          /home/.git/refs/heads
4          /home/.git/refs/tags
12         /home/.git/refs
4          /home/.git/branches
68         /home/.git/hooks
136        /home/.git
202348     /home
karli@KARLA:/home$
```

```
8.0K      /home/karli/.git/objects/88
8.0K      /home/karli/.git/objects/7d
8.0K      /home/karli/.git/objects/e7
8.0K      /home/karli/.git/objects/8c
8.0K      /home/karli/.git/objects/f3
8.0K      /home/karli/.git/objects/de
48K       /home/karli/.git/objects/05
12K       /home/karli/.git/objects/4b
8.0K      /home/karli/.git/objects/ce
8.0K      /home/karli/.git/objects/e6
216K      /home/karli/.git/objects
8.0K      /home/karli/.git/refs/remotes/origin
12K       /home/karli/.git/refs/remotes
8.0K      /home/karli/.git/refs/heads
4.0K      /home/karli/.git/refs/tags
28K       /home/karli/.git/refs
4.0K      /home/karli/.git/branches
68K       /home/karli/.git/hooks
380K      /home/karli/.git
4.0K      /home/karli/.landscape
197M      /home/karli
du: cannot read directory '/home/alfredo': Permission denied
4.0K      /home/alfredo
4.0K      /home/agosto25/karla
28K       /home/agosto25
8.0K      /home/.git/info
4.0K      /home/.git/objects/info
4.0K      /home/.git/objects/pack
8.0K      /home/.git/objects/4b
20K       /home/.git/objects
4.0K      /home/.git/refs/heads
4.0K      /home/.git/refs/tags
12K       /home/.git/refs
4.0K      /home/.git/branches
68K       /home/.git/hooks
136K      /home/.git
198M      /home
karli@KARLA:/home$ du -sh /home
du: cannot read directory '/home/alfredo': Permission denied
198M      /home
karli@KARLA:/home$
```

```
68K        ./karli/.git/hooks
380K       ./karli/.git
4.0K       ./karli/.landscape
197M       ./karli
du: cannot read directory './alfredo': Permission denied
4.0K       ./alfredo
4.0K       ./agosto25/karla
28K        ./agosto25
8.0K       ././git/info
4.0K       ././git/objects/info
4.0K       ././git/objects/pack
8.0K       ././git/objects/4b
20K        ././git/objects
4.0K       ././git/refs/heads
4.0K       ././git/refs/tags
12K        ././git/refs
4.0K       ././git/branches
68K        ././git/hooks
136K       ././git
198M       .
karli@KARLA:/home$ du -i
du: invalid option -- 'i'
Try 'du --help' for more information.
karli@KARLA:/home$ df -i
Filesystem       Inodes    IUsed     IFree IUse% Mounted on
none             452380        5    452375    1% /usr/lib/modules/6.6.87.2-micr
osoft-standard-WSL2
none             452380        2    452378    1% /mnt/wsl
drivers             999  -999001   1000000    -  /usr/lib/wsl/drivers
/dev/sdd       67108864   139032  66969832    1% /
none             452380       33    452347    1% /mnt/wslg
none             452380        5    452375    1% /usr/lib/wsl/lib
rootfs           451127       12    451115    1% /init
none             452380      556    451824    1% /run
none             452380        2    452378    1% /run/lock
none             452380        1    452379    1% /run/shm
none             452380       58    452322    1% /mnt/wslg/versions.txt
none             452380       58    452322    1% /mnt/wslg/doc
C:\                 999  -999001   1000000    -  /mnt/c
tmpfs            452380       41    452339    1% /run/user/1000
karli@KARLA:/home$
```

```
4          /home/.git/objects/info
4          /home/.git/objects/pack
8          /home/.git/objects/4b
20         /home/.git/objects
4          /home/.git/refs/heads
4          /home/.git/refs/tags
12         /home/.git/refs
4          /home/.git/branches
68         /home/.git/hooks
136        /home/.git
202348     /home
karli@KARLA:/home$ du -h
4.0K       ./Agosto25
4.0K       ./uno
8.0K       ./canny/tareas/.git/info
4.0K       ./canny/tareas/.git/objects/info
4.0K       ./canny/tareas/.git/objects/pack
8.0K       ./canny/tareas/.git/objects/4b
20K        ./canny/tareas/.git/objects
4.0K       ./canny/tareas/.git/refs/heads
4.0K       ./canny/tareas/.git/refs/tags
12K        ./canny/tareas/.git/refs
4.0K       ./canny/tareas/.git/branches
68K        ./canny/tareas/.git/hooks
136K       ./canny/tareas/.git
140K       ./canny/tareas
8.0K       ./canny/.git/logs/refs/remotes/origin
12K        ./canny/.git/logs/refs/remotes
8.0K       ./canny/.git/logs/refs/heads
24K        ./canny/.git/logs/refs
32K        ./canny/.git/logs
8.0K       ./canny/.git/info
8.0K       ./canny/.git/objects/fb
8.0K       ./canny/.git/objects/cb
8.0K       ./canny/.git/objects/f7
4.0K       ./canny/.git/objects/info
8.0K       ./canny/.git/objects/c6
12K        ./canny/.git/objects/45
4.0K       ./canny/.git/objects/pack
48K        ./canny/.git/objects/05
8.0K       ./canny/.git/objects/81
```

```
karli@KARLA:/home$ ls -l
total 28
drwxr-xr-x  2 root    root     4096 Aug 29 21:35 Agosto25
-rw-r--r--  1 root    root     1041 Aug 21 16:12 administracion.txt
drwxr-xr-x  3 root    root     4096 Aug 21 15:58 agosto25
drwxr-x---  5  1002 alfredo 4096 Oct  2 19:38 alfredo
-rw-r--r--  1 root    root        0 Aug 29 21:35 archivo1.txt
drwxr-xr-x  4 root    root     4096 Aug 29 21:41 canny
drwxr-x--- 22 karli  karli    4096 Sep 26 21:04 karli
drwxr-xr-x  2 root    root     4096 Aug 14 16:49 uno
karli@KARLA:/home$ du /home
4        /home/Agosto25
4        /home/uno
8        /home/canny/tareas/.git/info
4        /home/canny/tareas/.git/objects/info
4        /home/canny/tareas/.git/objects/pack
8        /home/canny/tareas/.git/objects/4b
20       /home/canny/tareas/.git/objects
4        /home/canny/tareas/.git/refs/heads
4        /home/canny/tareas/.git/refs/tags
12       /home/canny/tareas/.git/refs
4        /home/canny/tareas/.git/branches
68       /home/canny/tareas/.git/hooks
136      /home/canny/tareas/.git
140      /home/canny/tareas
8        /home/canny/.git/logs/refs/remotes/origin
12       /home/canny/.git/logs/refs/remotes
8        /home/canny/.git/logs/refs/heads
24       /home/canny/.git/logs/refs
32       /home/canny/.git/logs
8        /home/canny/.git/info
8        /home/canny/.git/objects/fb
8        /home/canny/.git/objects/cb
8        /home/canny/.git/objects/f7
4        /home/canny/.git/objects/info
8        /home/canny/.git/objects/c6
12       /home/canny/.git/objects/45
4        /home/canny/.git/objects/pack
48       /home/canny/.git/objects/05
8        /home/canny/.git/objects/81
8        /home/canny/.git/objects/03
```

```
karli@KARLA:~$ du /home
4         /home/Agosto25
4         /home/uno
8         /home/canny/tareas/.git/info
4         /home/canny/tareas/.git/objects/info
4         /home/canny/tareas/.git/objects/pack
8         /home/canny/tareas/.git/objects/4b
20        /home/canny/tareas/.git/objects
4         /home/canny/tareas/.git/refs/heads
4         /home/canny/tareas/.git/refs/tags
12        /home/canny/tareas/.git/refs
4         /home/canny/tareas/.git/branches
68        /home/canny/tareas/.git/hooks
136       /home/canny/tareas/.git
140       /home/canny/tareas
8         /home/canny/.git/logs/refs/remotes/origin
12        /home/canny/.git/logs/refs/remotes
8         /home/canny/.git/logs/refs/heads
24        /home/canny/.git/logs/refs
32        /home/canny/.git/logs
8         /home/canny/.git/info
8         /home/canny/.git/objects/fb
8         /home/canny/.git/objects/cb
8         /home/canny/.git/objects/f7
4         /home/canny/.git/objects/info
8         /home/canny/.git/objects/c6
12        /home/canny/.git/objects/45
4         /home/canny/.git/objects/pack
48        /home/canny/.git/objects/05
8         /home/canny/.git/objects/81
8         /home/canny/.git/objects/03
120       /home/canny/.git/objects
8         /home/canny/.git/refs/remotes/origin
12        /home/canny/.git/refs/remotes
8         /home/canny/.git/refs/heads
4         /home/canny/.git/refs/tags
28        /home/canny/.git/refs
4         /home/canny/.git/branches
68        /home/canny/.git/hooks
284       /home/canny/.git
476       /home/canny
```

```
none                  1.8G  100K  1.8G   1% /mnt/wslg/doc
C:\                   476G  163G  314G  35% /mnt/c
tmpfs                 1.8G   16K  1.8G   1% /run/user/1000
karli@KARLA:~$ df -i
Filesystem        Inodes    IUsed    IFree IUse% Mounted on
none              452380        5   452375    1% /usr/lib/modules/6.6.87.2
-microsoft-standard-WSL2
none              452380        2   452378    1% /mnt/wsl
drivers              999  -999001  1000000     - /usr/lib/wsl/drivers
/dev/sdd        67108864   139032 66969832    1% /
none              452380       33   452347    1% /mnt/wslg
none              452380        5   452375    1% /usr/lib/wsl/lib
rootfs            451127       12   451115    1% /init
none              452380      556   451824    1% /run
none              452380        2   452378    1% /run/lock
none              452380        1   452379    1% /run/shm
none              452380       58   452322    1% /mnt/wslg/versions.txt
none              452380       58   452322    1% /mnt/wslg/doc
C:\                  999  -999001  1000000     - /mnt/c
tmpfs             452380       41   452339    1% /run/user/1000
karli@KARLA:~$ df -n
df: invalid option -- 'n'
Try 'df --help' for more information.
karli@KARLA:~$ df -m
Filesystem      1M-blocks    Used Available Use% Mounted on
none                 1768       0      1768   0% /usr/lib/modules/6.6.87.2
-microsoft-standard-WSL2
none                 1768       1      1768   1% /mnt/wsl
drivers            487240  166582    320659  35% /usr/lib/wsl/drivers
/dev/sdd          1031019    4134    974441   1% /
none                 1768       1      1768   1% /mnt/wslg
none                 1768       0      1768   0% /usr/lib/wsl/lib
rootfs               1763       3      1760   1% /init
none                 1768       1      1767   1% /run
none                 1768       0      1768   0% /run/lock
none                 1768       0      1768   0% /run/shm
none                 1768       1      1768   1% /mnt/wslg/versions.txt
none                 1768       1      1768   1% /mnt/wslg/doc
C:\                487240  166582    320659  35% /mnt/c
tmpfs                1768       1      1768   1% /run/user/1000
karli@KARLA:~$
```

```
none                1809520           0    1809520    0% /run/shm
none                1809520         100    1809420    1% /mnt/wslg/versions.tx
t
none                1809520         100    1809420    1% /mnt/wslg/doc
C:\               498933756   170574732  328359024   35% /mnt/c
tmpfs               1809520          16    1809504    1% /run/user/1000
karli@KARLA:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
none            1.8G     0  1.8G   0% /usr/lib/modules/6.6.87.2-microsof
t-standard-WSL2
none            1.8G  4.0K  1.8G   1% /mnt/wsl
drivers         476G  163G  314G  35% /usr/lib/wsl/drivers
/dev/sdd       1007G  4.1G  952G   1% /
none            1.8G   80K  1.8G   1% /mnt/wslg
none            1.8G     0  1.8G   0% /usr/lib/wsl/lib
rootfs          1.8G  2.7M  1.8G   1% /init
none            1.8G  536K  1.8G   1% /run
none            1.8G     0  1.8G   0% /run/lock
none            1.8G     0  1.8G   0% /run/shm
none            1.8G  100K  1.8G   1% /mnt/wslg/versions.txt
none            1.8G  100K  1.8G   1% /mnt/wslg/doc
C:\             476G  163G  314G  35% /mnt/c
tmpfs           1.8G   16K  1.8G   1% /run/user/1000
karli@KARLA:~$ df -i
Filesystem       Inodes   IUsed    IFree IUse% Mounted on
none             452380       5   452375    1% /usr/lib/modules/6.6.87.2
-microsoft-standard-WSL2
none             452380       2   452378    1% /mnt/wsl
drivers             999 -999001  1000000     - /usr/lib/wsl/drivers
/dev/sdd       67108864  139032 66969832    1% /
none             452380      33   452347    1% /mnt/wslg
none             452380       5   452375    1% /usr/lib/wsl/lib
rootfs           451127      12   451115    1% /init
none             452380     556   451824    1% /run
none             452380       2   452378    1% /run/lock
none             452380       1   452379    1% /run/shm
none             452380      58   452322    1% /mnt/wslg/versions.txt
none             452380      58   452322    1% /mnt/wslg/doc
C:\                 999 -999001  1000000     - /mnt/c
tmpfs            452380      41   452339    1% /run/user/1000
karli@KARLA:~$
```

```
karli@KARLA:~$ df
Filesystem       1K-blocks      Used  Available Use% Mounted on
none              1809520         0    1809520   0% /usr/lib/modules/6.6.
87.2-microsoft-standard-WSL2
none              1809520         4    1809516   1% /mnt/wsl
drivers         498933756 170574732 328359024  35% /usr/lib/wsl/drivers
/dev/sdd       1055762868   4232464 997826932   1% /
none              1809520        80    1809440   1% /mnt/wslg
none              1809520         0    1809520   0% /usr/lib/wsl/lib
rootfs            1804508      2664    1801844   1% /init
none              1809520       540    1808980   1% /run
none              1809520         0    1809520   0% /run/lock
none              1809520         0    1809520   0% /run/shm
none              1809520       100    1809420   1% /mnt/wslg/versions.tx
t
none              1809520       100    1809420   1% /mnt/wslg/doc
C:\             498933756 170574732 328359024  35% /mnt/c
tmpfs             1809520        16    1809504   1% /run/user/1000
karli@KARLA:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
none            1.8G     0  1.8G   0% /usr/lib/modules/6.6.87.2-microsof
t-standard-WSL2
none            1.8G  4.0K  1.8G   1% /mnt/wsl
drivers         476G  163G  314G  35% /usr/lib/wsl/drivers
/dev/sdd       1007G  4.1G  952G   1% /
none            1.8G   80K  1.8G   1% /mnt/wslg
none            1.8G     0  1.8G   0% /usr/lib/wsl/lib
rootfs          1.8G  2.7M  1.8G   1% /init
none            1.8G  536K  1.8G   1% /run
none            1.8G     0  1.8G   0% /run/lock
none            1.8G     0  1.8G   0% /run/shm
none            1.8G  100K  1.8G   1% /mnt/wslg/versions.txt
none            1.8G  100K  1.8G   1% /mnt/wslg/doc
C:\             476G  163G  314G  35% /mnt/c
tmpfs           1.8G   16K  1.8G   1% /run/user/1000
karli@KARLA:~$
```

```
Mem:         3619044      850548     1924600        3576       926232
  2768496
Swap:        1048576           0     1048576

              total        used        free      shared   buff/cache    a
vailable
Mem:         3619044      850548     1924600        3576       926232
  2768496
Swap:        1048576           0     1048576
karli@KARLA:~$ free -c 3
              total        used        free      shared   buff/cache    a
vailable
Mem:         3619044      826540     1948588        3572       926248
  2792504
Swap:        1048576           0     1048576

              total        used        free      shared   buff/cache    a
vailable
Mem:         3619044      826540     1948588        3572       926248
  2792504
Swap:        1048576           0     1048576

              total        used        free      shared   buff/cache    a
vailable
Mem:         3619044      826540     1948588        3572       926256
  2792504
Swap:        1048576           0     1048576
karli@KARLA:~$ free -c 1
              total        used        free      shared   buff/cache    a
vailable
Mem:         3619044      829136     1945984        3572       926304
  2789908
Swap:        1048576           0     1048576
karli@KARLA:~$ free -t
              total        used        free      shared   buff/cache    a
vailable
Mem:         3619044      831828     1943224        3572       926356
  2787216
Swap:        1048576           0     1048576
Total:       4667620      831828     2991800
karli@KARLA:~$
```

```
1  0       0 1939936  59440 866500    0    0   179 1983 636    0  1  1
99  0  0  0
karli@KARLA:~$ vmstat 2
procs -----------memory---------- ---swap-- -----io---- -system-- ------
-cpu-------
r  b   swpd   free   buff  cache   si   so    bi    bo   in   cs us sy
id wa st gu
1  1       0 1940480  59460 866612    0    0   178 2010 636    0  1  1
99  0  0  0
1  0       0 2006648  59460 748852    0    0     0    0 1368 634  6  3
90  1  0  0
0  0       0 1945532  59460 866624    0    0     0    0  845 460  2  2
95  0  0  0
0  0       0 1945532  59472 866624    0    0     0   46  371 416  0  0
100  0  0  0
^Z
[2]+  Stopped                 vmstat 2
karli@KARLA:~$ vmstat 1
procs -----------memory---------- ---swap-- -----io---- -system-- ------
-cpu-------
r  b   swpd   free   buff  cache   si   so    bi    bo   in   cs us sy
id wa st gu
1  0       0 1948884  59472 866624    0    0   177 2003 636    0  1  1
99  0  0  0
0  0       0 1948632  59472 866624    0    0     0    0  392 643  0  0
99  0  0  0
0  0       0 1948632  59472 866624    0    0     0    0  214 383  0  0
100  0  0  0
0  0       0 1948632  59472 866624    0    0     0    0  210 391  0  0
100  0  0  0
0  0       0 1948632  59472 866624    0    0     0    0  211 374  0  0
100  0  0  0
0  0       0 1948632  59472 866624    0    0     0    0  216 392  0  0
100  0  0  0
0  0       0 1948632  59480 866624    0    0     0  168  244 404  0  0
99  1  0  0
0  0       0 1948632  59480 866624    0    0     0    0  210 374  0  0
100  0  0  0
0  0       0 1948632  59480 866624    0    0     0    0  215 388  0  0
100  0  0  0
```

Nota: utilice un comando que no y se me borro el archivo, quise verificar la history pero no visualice los comandos que se utilizaron en clase, por eso mismo guarde mi respaldo y lo subo como pdf.