

Lab 4 The Linux File System

Question 1: The linux filesystem

Directory	Function
bin	it is a subdirectory of the root directory that contains executable programs which are essential for booting purposes and system repairment
dev	it contains special device files that control access to peripheral devices
etc	it contains all your system configuration in it.
home	it is a place where by default all user home directories are created .It contains the personal files of a particular user of the system .
media	Directory for mounting files systems on removable media like CD-ROM drives, floppy disks, and Zip drives.
opt	it is reserved for all the software and add-on packages that are not part of the default installation.
proc	A special directory in a virtual filesystem. It contains the information about various aspects of a Linux system.
srv	It holds site specific data to be served by the system for protocols such as, ftp, rsync, www, etc
usr	It is a secondary file hierarchy that contains shareable, read-only data.
var	It contains variable data files

Command	What it does	Syntax	Example
cd	used to change the current working directory	<code>cd + Destination</code>	<code>cd \$HOME</code>
pwd	displays the current working directory	<code>pwd</code>	<code>pwd</code>
ls	displays all file inside a given directory /current working directory	<code>ls+option+paths</code>	<code>ls -a</code> Downloads

Question #2

```

katy@cis106:~$ pwd
/home/katy
katy@cis106:~$ cd /home/katy/Downloads
katy@cis106:~/Downloads$ pwd
/home/katy/Downloads
katy@cis106:~/Downloads$ cd ../
katy@cis106:~$ pwd
/home/katy
katy@cis106:~$ cd ../../
katy@cis106:/$ pwd
/
katy@cis106:/$ cd
katy@cis106:~$ cd -
/
katy@cis106:/$ pwd
/
katy@cis106:/$

```

I used absolute path

katy@cis106: ~/practicels

```

katy@cis106:~/practicels$ ls
book.txt      history-debian.pdf  movie.mp4  song.mp3      tux-penguin.gif
countries.xml  homework.docx       people.csv  tux-nobg.png
katy@cis106:~/practicels$ ls -l
total 2932
-rw-rw-r-- 1 katy katy 1843 Feb 27 13:39 book.txt
-rw-rw-r-- 1 katy katy 23972 Feb 27 13:46 countries.xml
-rw-rw-r-- 1 katy katy 163057 Feb 27 13:41 history-debian.pdf
-rw-rw-r-- 1 katy katy 111303 Feb 22 14:14 homework.docx
-rw-rw-r-- 1 katy katy 1570024 Feb 27 13:42 movie.mp4
-rw-rw-r-- 1 katy katy 284042 Feb 27 13:45 people.csv
-rw-rw-r-- 1 katy katy 764176 Feb 27 13:44 song.mp3
-rw-rw-r-- 1 katy katy 21314 Feb 27 13:40 tux-nobg.png
-rw-rw-r-- 1 katy katy 44299 Jan 31 2020 tux-penguin.gif
katy@cis106:~/practicels$ ls -lht
total 2.9M
-rw-rw-r-- 1 katy katy 24K Feb 27 13:46 countries.xml
-rw-rw-r-- 1 katy katy 278K Feb 27 13:45 people.csv
-rw-rw-r-- 1 katy katy 747K Feb 27 13:44 song.mp3
-rw-rw-r-- 1 katy katy 1.5M Feb 27 13:42 movie.mp4
-rw-rw-r-- 1 katy katy 160K Feb 27 13:41 history-debian.pdf
-rw-rw-r-- 1 katy katy 21K Feb 27 13:40 tux-nobg.png
-rw-rw-r-- 1 katy katy 1.1K Feb 27 13:39 book.txt
-rw-rw-r-- 1 katy katy 109K Feb 22 14:14 homework.docx
-rw-rw-r-- 1 katy katy 44K Jan 31 2020 tux-penguin.gif
katy@cis106:~/practicels$ ls -lhG5
total 2.9M
-rw-rw-r-- 1 1.5M Feb 27 13:42 movie.mp4
-rw-rw-r-- 1 747K Feb 27 13:44 song.mp3
-rw-rw-r-- 1 278K Feb 27 13:45 people.csv
-rw-rw-r-- 1 160K Feb 27 13:41 history-debian.pdf
-rw-rw-r-- 1 109K Feb 22 14:14 homework.docx
-rw-rw-r-- 1 44K Jan 31 2020 tux-penguin.gif
-rw-rw-r-- 1 24K Feb 27 13:46 countries.xml
-rw-rw-r-- 1 21K Feb 27 13:40 tux-nobg.png
-rw-rw-r-- 1 1.1K Feb 27 13:39 book.txt
katy@cis106:~/practicels$ ls -mr
tux-penguin.gif, tux-nobg.png, song.mp3, people.csv, movie.mp4, homework.docx,
history-debian.pdf, countries.xml, book.txt
katy@cis106:~/practicels$ ls -lX
people.csv

```

```

katy@cisl06:~$ pwd
/home/katy
katy@cisl06:~$ cd
katy@cisl06:~$ cd $HOME
katy@cisl06:~$ cd ~/share/themes
katy@cisl06:~/share/themes$ cd ../../
katy@cisl06:~$ ls -A $HOME
.bash_history      Desktop           Music             .sudo_as_admin_successful
.bash_logout       Documents        Pictures          Templates
.bashrc            Downloads        .pki              .themes
.blocks-log        .gitconfig       practicels        .vboxclient-clipboard.pid
.blocks-progress   .gnupg           .profile          .vboxclient-display-svg-x11.pid
.cache             .icons           Public            .vboxclient-draganddrop.pid
cisl06             .lessht         share             .vboxclient-seamless.pid
cisl06.png         .local           snap              Videos
.config            .mozilla         .ssh              .vscode
katy@cisl06:~$ ls -Xt ~/cisl06/lab/lab0
what_is_ubuntu.png      what_is_ubuntu_submission.html  kubuntu.png
what_is_ubuntu_submission.pdf  what_is_ubuntu_submission.md  kylin.png
kubuntu.png             lubuntu.png                    budgie.png
studio.png              mate.png                       core.png
ubuntu.png              desktop.png
katy@cisl06:~$ ls -Rr ~/cisl06/lab/lab0
/home/katy/cisl06/lab/lab0:
kubuntu.png      what_is_ubuntu_submission.pdf  lubuntu.png  core.png
what_is_ubuntu_submission.pdf  ubuntu.png                    kylin.png    budgie.png
what_is_ubuntu_submission.md   studio.png                    kubuntu.png
what_is_ubuntu_submission.html mate.png                      desktop.png
katy@cisl06:~$ ls -lh $HOME
total 48K
drwxrwxr-x 7 katy katy 4.0K Mar  6 17:07 cisl06
drwxr-xr-x 2 katy katy 4.0K Mar  6 15:36 Desktop
drwxr-xr-x 2 katy katy 4.0K Feb 24 00:18 Documents
drwxr-xr-x 2 katy katy 4.0K Mar  6 15:23 Downloads
drwxr-xr-x 2 katy katy 4.0K Feb 19 16:18 Music
drwxr-xr-x 2 katy katy 4.0K Mar  6 17:20 Pictures
drwxrwxr-x 2 katy katy 4.0K Feb 27 13:46 practicels
drwxr-xr-x 2 katy katy 4.0K Feb 19 16:18 Public
drwxrwxr-x 3 katy katy 4.0K Mar  6 16:03 share
drwx----- 4 katy katy 4.0K Feb 19 18:50 snap
drwxr-xr-x 2 katy katy 4.0K Feb 19 16:18 Templates
drwxr-xr-x 2 katy katy 4.0K Feb 19 16:18 Videos
katy@cisl06:~$ ls -lGg --full-time $Home
total 48
drwxrwxr-x 7 4096 2022-03-06 17:07:49.756516259 -0500 cisl06
drwxr-xr-x 2 4096 2022-03-06 15:36:48.096720231 -0500 Desktop
drwxr-xr-x 2 4096 2022-02-24 00:18:58.053556442 -0500 Documents
drwxr-xr-x 2 4096 2022-03-06 15:23:13.252750662 -0500 Downloads
drwxr-xr-x 2 4096 2022-02-19 16:18:21.289433951 -0500 Music
drwxr-xr-x 2 4096 2022-03-06 17:20:10.732488587 -0500 Pictures
drwxrwxr-x 2 4096 2022-02-27 13:46:18.000000000 -0500 practicels
drwxr-xr-x 2 4096 2022-02-19 16:18:21.289433951 -0500 Public
drwxrwxr-x 3 4096 2022-03-06 16:03:39.720660043 -0500 share
drwx----- 4 4096 2022-02-19 18:50:10.315961419 -0500 snap
drwxr-xr-x 2 4096 2022-02-19 16:18:21.289433951 -0500 Templates
drwxr-xr-x 2 4096 2022-02-19 16:18:21.289433951 -0500 Videos
katy@cisl06:~$ █

```

```
katy@cis106:~$ pwd
/home/katy
katy@cis106:~$ cd /usr/share/themes
katy@cis106:/usr/share/themes$ pwd
/usr/share/themes
katy@cis106:/usr/share/themes$ cd /
katy@cis106:/$ cd /etc/firefox/
katy@cis106:/etc/firefox$
```

```
katy@cis106:/etc/firefox$ cd
katy@cis106:~$ cd Downloads/
katy@cis106:~/Downloads$ cd ../../
katy@cis106:/home$ pwd
/home
katy@cis106:/home$ cd katy/Documents/
katy@cis106:~/Documents$
```

Question 3

```

katy@cis106: ~/lab4files
katy@cis106:~$ cd /usr/share/
katy@cis106:/usr/share$ ls /home/katy/lab4files/
countries.json  document.docx  helloWorld.c  sample.xls  Ubuntu.pdf
csvfile.csv    globe.avi      Linux.pdf     Tux.png     website.html
katy@cis106:/usr/share$ cd ~/lab4files/
katy@cis106:~/lab4files$ ls -lh
total 6.5M
-rw-rw-r-- 1 katy katy 20K Feb 22 14:16 countries.json
-rw-rw-r-- 1 katy katy 278K Feb 22 14:15 csvfile.csv
-rw-rw-r-- 1 katy katy 747K Feb 22 14:13 document.docx
-rw-rw-r-- 1 katy katy 726K Feb 22 14:12 globe.avi
-rw-rw-r-- 1 katy katy 76 Feb 22 14:18 helloWorld.c
-rw-rw-r-- 1 katy katy 2.5M Feb 22 14:10 Linux.pdf
-rw-rw-r-- 1 katy katy 8.5K Feb 22 14:12 sample.xls
-rw-rw-r-- 1 katy katy 42K Feb 22 14:10 Tux.png
-rw-rw-r-- 1 katy katy 2.1M Feb 22 14:11 Ubuntu.pdf
-rw-rw-r-- 1 katy katy 135K Feb 22 14:16 website.html
katy@cis106:~/lab4files$ ls -lhS
total 6.5M
-rw-rw-r-- 1 katy katy 2.5M Feb 22 14:10 Linux.pdf
-rw-rw-r-- 1 katy katy 2.1M Feb 22 14:11 Ubuntu.pdf
-rw-rw-r-- 1 katy katy 747K Feb 22 14:13 document.docx
-rw-rw-r-- 1 katy katy 726K Feb 22 14:12 globe.avi
-rw-rw-r-- 1 katy katy 278K Feb 22 14:15 csvfile.csv
-rw-rw-r-- 1 katy katy 135K Feb 22 14:16 website.html
-rw-rw-r-- 1 katy katy 42K Feb 22 14:10 Tux.png
-rw-rw-r-- 1 katy katy 20K Feb 22 14:16 countries.json
-rw-rw-r-- 1 katy katy 8.5K Feb 22 14:12 sample.xls
-rw-rw-r-- 1 katy katy 76 Feb 22 14:18 helloWorld.c
katy@cis106:~/lab4files$

katy@cis106: ~/lab4files x
katy@cis106: ~/lab4files
katy@cis106:~/lab4files$ ls -lhSgGi
total 6.5M
1204255 -rw-rw-r-- 1 2.5M Feb 22 14:10 Linux.pdf
1204289 -rw-rw-r-- 1 2.1M Feb 22 14:11 Ubuntu.pdf
1204292 -rw-rw-r-- 1 747K Feb 22 14:13 document.docx
1204293 -rw-rw-r-- 1 726K Feb 22 14:12 globe.avi
1204291 -rw-rw-r-- 1 278K Feb 22 14:15 csvfile.csv
1204296 -rw-rw-r-- 1 135K Feb 22 14:16 website.html
1204288 -rw-rw-r-- 1 42K Feb 22 14:10 Tux.png
1204290 -rw-rw-r-- 1 20K Feb 22 14:16 countries.json
1204295 -rw-rw-r-- 1 8.5K Feb 22 14:12 sample.xls
1204294 -rw-rw-r-- 1 76 Feb 22 14:18 helloWorld.c
katy@cis106:~/lab4files$ ls -Xr
sample.xls  Ubuntu.pdf  countries.json  document.docx  helloWorld.c
Tux.png    Linux.pdf   website.html   csvfile.csv   globe.avi
katy@cis106:~/lab4files$

```

Question 4

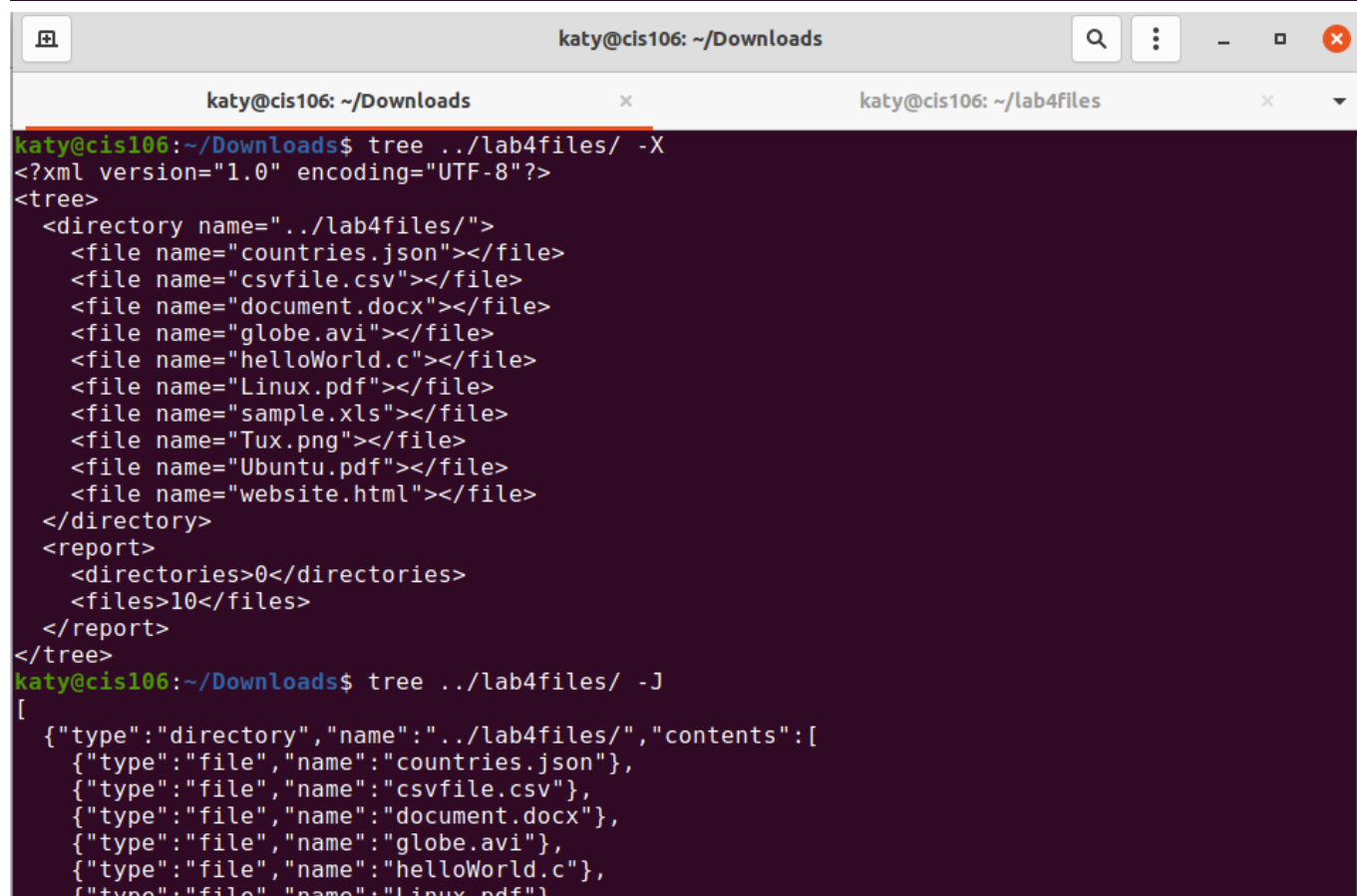
```

katy@cis106:/$ cd /etc/
katy@cis106:/etc$ tree ~/lab4files/
/home/katy/lab4files/
├── countries.json
├── csvfile.csv
├── document.docx
├── globe.avi
├── helloWorld.c
├── Linux.pdf
├── sample.xls
├── Tux.png
├── Ubuntu.pdf
└── website.html

0 directories, 10 files
katy@cis106:/etc$ cd ~/Downloads/
katy@cis106:~/Downloads$ tree ../lab4files/ -fph
../lab4files
├── [-rw-rw-r-- 20K]  ../lab4files/countries.json
├── [-rw-rw-r-- 277K]  ../lab4files/csvfile.csv
├── [-rw-rw-r-- 746K]  ../lab4files/document.docx
├── [-rw-rw-r-- 725K]  ../lab4files/globe.avi
├── [-rw-rw-r-- 76]    ../lab4files/helloWorld.c
├── [-rw-rw-r-- 2.5M]  ../lab4files/Linux.pdf
├── [-rw-rw-r-- 8.5K]  ../lab4files/sample.xls
├── [-rw-rw-r-- 42K]   ../lab4files/Tux.png
├── [-rw-rw-r-- 2.0M]  ../lab4files/Ubuntu.pdf
└── [-rw-rw-r-- 134K]  ../lab4files/website.html

0 directories, 10 files
katy@cis106:~/Downloads$ tree ../lab4files/ -tug
../lab4files/
├── [katy   katy   ]  Linux.pdf
├── [katy   katy   ]  Tux.png
├── [katy   katy   ]  Ubuntu.pdf
├── [katy   katy   ]  sample.xls
├── [katy   katy   ]  globe.avi
├── [katy   katy   ]  document.docx
├── [katy   katy   ]  csvfile.csv
├── [katy   katy   ]  countries.json
├── [katy   katy   ]  website.html
└── [katy   katy   ]  helloWorld.c

```



The screenshot shows a terminal window with two tabs: 'katy@cis106: ~/Downloads' and 'katy@cis106: ~/lab4files'. The active tab is 'katy@cis106: ~/Downloads'. The terminal shows the execution of the 'tree' command with XML and JSON output options.

```

katy@cis106:~/Downloads$ tree ../lab4files/ -X
<?xml version="1.0" encoding="UTF-8"?>
<tree>
  <directory name="../lab4files/">
    <file name="countries.json"></file>
    <file name="csvfile.csv"></file>
    <file name="document.docx"></file>
    <file name="globe.avi"></file>
    <file name="helloWorld.c"></file>
    <file name="Linux.pdf"></file>
    <file name="sample.xls"></file>
    <file name="Tux.png"></file>
    <file name="Ubuntu.pdf"></file>
    <file name="website.html"></file>
  </directory>
  <report>
    <directories>0</directories>
    <files>10</files>
  </report>
</tree>
katy@cis106:~/Downloads$ tree ../lab4files/ -J
[
  {
    "type": "directory",
    "name": "../lab4files/",
    "contents": [
      {
        "type": "file",
        "name": "countries.json",
      },
      {
        "type": "file",
        "name": "csvfile.csv",
      },
      {
        "type": "file",
        "name": "document.docx",
      },
      {
        "type": "file",
        "name": "globe.avi",
      },
      {
        "type": "file",
        "name": "helloWorld.c",
      },
      {
        "type": "file",
        "name": "Linux.pdf",
      },
      {
        "type": "file",
        "name": "sample.xls",
      },
      {
        "type": "file",
        "name": "Tux.png",
      },
      {
        "type": "file",
        "name": "Ubuntu.pdf",
      },
      {
        "type": "file",
        "name": "website.html",
      }
    ]
  }
]

```

```
{ "type": "file", "name": "Linux.pdf" },  
{"type": "file", "name": "sample.xls"},  
{"type": "file", "name": "Tux.png"},  
{"type": "file", "name": "Ubuntu.pdf"},  
{"type": "file", "name": "website.html"}  
  ]},  
{"type": "report", "directories": 0, "files": 10}  
]  
katy@cis106:~/Downloads$
```

Question 5


```

katy@cis106:~$ exa --help
Usage:
  exa [options] [files...]

META OPTIONS
  -?, --help          show list of command-line options
  -v, --version        show version of exa

DISPLAY OPTIONS
  -l, --oneline        display one entry per line
  -l, --long           display extended file metadata as a table
  -G, --grid           display entries as a grid (default)
  -X, --across         sort the grid across, rather than downwards
  -R, --recurse        recurse into directories
  -T, --tree           recurse into directories as a tree
  -F, --classify       display type indicator by file names
  --colo[u]r=WHEN      when to use terminal colours (always, auto, never)
  --colo[u]r-scale     highlight levels of file sizes distinctly
  --icons              display icons
  --no-icons           don't display icons (always overrides --icons)

FILTERING AND SORTING OPTIONS
  -a, --all            show hidden and 'dot' files
  -d, --list-dirs      list directories as files; don't list their contents
  -L, --level DEPTH   limit the depth of recursion
  -r, --reverse        reverse the sort order
  -s, --sort SORT_FIELD which field to sort by
  --group-directories-first list directories before other files
  -D, --only-dirs      list only directories
  -I, --ignore-glob GLOBS glob patterns (pipe-separated) of files to ignore
  --git-ignore         ignore files mentioned in '.gitignore'
Valid sort fields:    name, Name, extension, Extension, size, type,
                     modified, accessed, created, inode, and none.
                     date, time, old, and new all refer to modified.

LONG VIEW OPTIONS
  -b, --binary         list file sizes with binary prefixes
  -B, --bytes          list file sizes in bytes, without any prefixes
  -g, --group          list each file's group
  -h, --header         add a header row to each column
  -H, --links          list each file's number of hard links
  -i, --inode          list each file's inode number
  -m, --modified       use the modified timestamp field
  -n, --numeric        list numeric user and group IDs
  -S, --blocks         show number of file system blocks
  -t, --time FIELD     which timestamp field to list (modified, accessed, created)
  -u, --accessed       use the accessed timestamp field
  -U, --created        use the created timestamp field
  --changed            use the changed timestamp field
  --time-style         how to format timestamps (default, iso, long-iso, full-iso)
  --no-permissions     suppress the permissions field
  --octal-permissions  list each file's permission in octal format
  --no-filesize        suppress the filesize field
  --no-user            suppress the user field
  --no-time            suppress the time field
  --git               list each file's Git status, if tracked or ignored
  -@, --extended       list each file's extended attributes and sizes

```

```

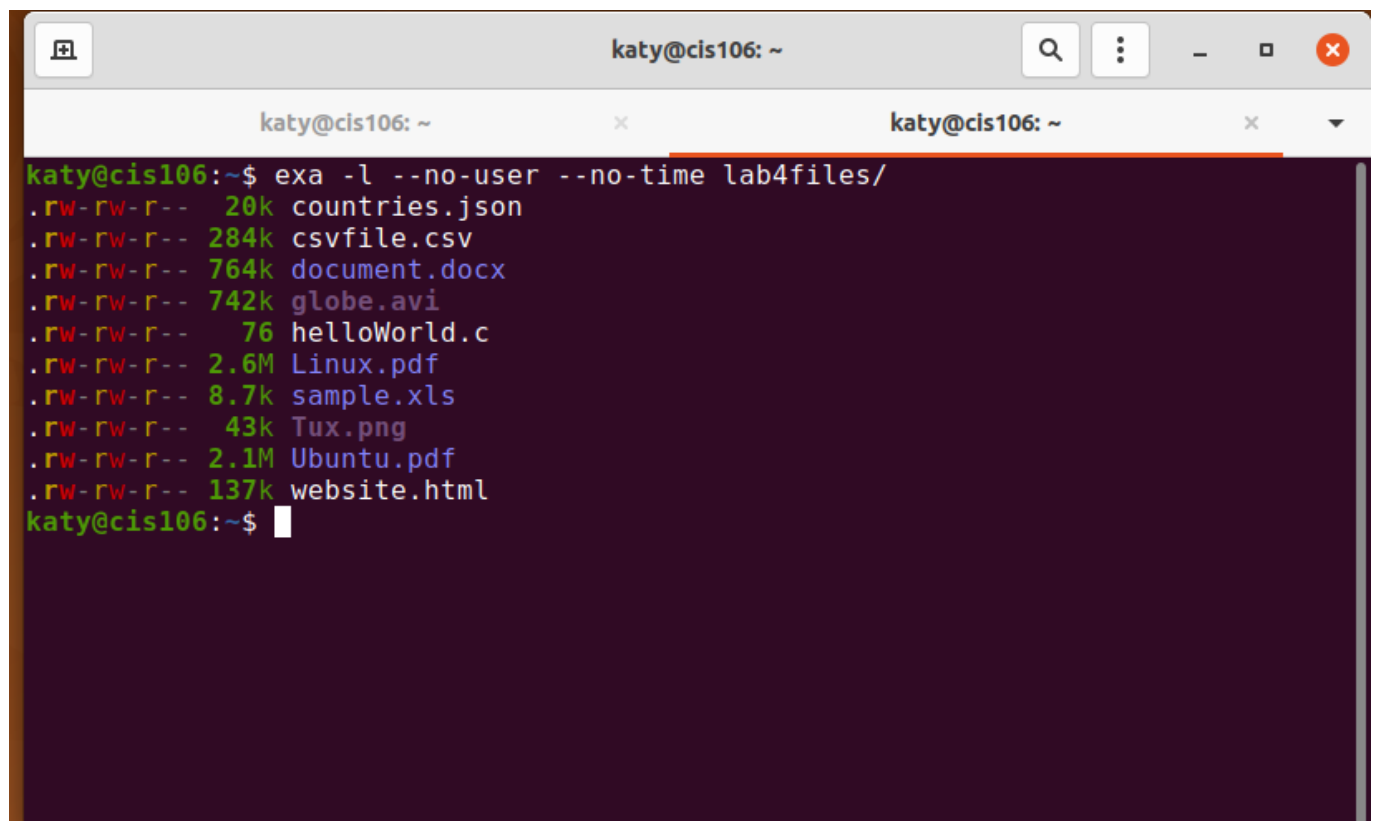
katy@cis106:~$ exa -l lab4files/
.rw-rw-r-- 20k katy 22 Feb 14:16 countries.json
.rw-rw-r-- 284k katy 22 Feb 14:15 csvfile.csv
.rw-rw-r-- 764k katy 22 Feb 14:13 document.docx
.rw-rw-r-- 742k katy 22 Feb 14:12 globe.avi
.rw-rw-r-- 76 katy 22 Feb 14:18 helloWorld.c
.rw-rw-r-- 2.6M katy 22 Feb 14:10 Linux.pdf
.rw-rw-r-- 8.7k katy 22 Feb 14:12 sample.xls
.rw-rw-r-- 43k katy 22 Feb 14:10 Tux.png
.rw-rw-r-- 2.1M katy 22 Feb 14:11 Ubuntu.pdf
.rw-rw-r-- 137k katy 22 Feb 14:16 website.html
katy@cis106:~$ exa -T lab4files/
lab4files
├── countries.json
├── csvfile.csv
├── document.docx
├── globe.avi
├── helloWorld.c
├── Linux.pdf
├── sample.xls
├── Tux.png
├── Ubuntu.pdf
├── website.html

```



```
└─ sample.xls
└─ Tux.png
└─ Ubuntu.pdf
└─ website.html
```

```
katy@cis106:~$ exa -lh lab4files/
Permissions Size User Date Modified Name
.rw-rw-r-- 20k katy 22 Feb 14:16 countries.json
.rw-rw-r-- 284k katy 22 Feb 14:15 csvfile.csv
.rw-rw-r-- 764k katy 22 Feb 14:13 document.docx
.rw-rw-r-- 742k katy 22 Feb 14:12 globe.avi
.rw-rw-r-- 76 katy 22 Feb 14:18 helloWorld.c
.rw-rw-r-- 2.6M katy 22 Feb 14:10 Linux.pdf
.rw-rw-r-- 8.7k katy 22 Feb 14:12 sample.xls
.rw-rw-r-- 43k katy 22 Feb 14:10 Tux.png
.rw-rw-r-- 2.1M katy 22 Feb 14:11 Ubuntu.pdf
.rw-rw-r-- 137k katy 22 Feb 14:16 website.html
katy@cis106:~$
```



```
katy@cis106:~$ exa -l --no-user --no-time lab4files/
.rw-rw-r-- 20k countries.json
.rw-rw-r-- 284k csvfile.csv
.rw-rw-r-- 764k document.docx
.rw-rw-r-- 742k globe.avi
.rw-rw-r-- 76 helloWorld.c
.rw-rw-r-- 2.6M Linux.pdf
.rw-rw-r-- 8.7k sample.xls
.rw-rw-r-- 43k Tux.png
.rw-rw-r-- 2.1M Ubuntu.pdf
.rw-rw-r-- 137k website.html
katy@cis106:~$
```