

File Search and Handling 2

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1. Log to your system as normal user. On your home directory create three directories named DOCS, PRINTS and PROJECTS.

```
nlauzon@server1:~$ ls -l |grep list
-rw-rw-r--. 1 nlauzon nlauzon 21 Feb 14 13:23 shopping_list
[nlauzon@server1 ~]$ ls
computers doc1 Downloads Music Public Tmp2 Videos
Desktop doc2 file2 mypasswd shopping_listTmp3
dir1 doc3 Foods Pictures Templates Trip3
dir2 Documents maintenance pro Tmp1 Trips
[nlauzon@server1 ~]$ mkdir DOCS PRINTS PROJECTS
[nlauzon@server1 ~]$ ls
computers doc1 Documents maintenance PRINTS shopping_list Tmp3
Desktop doc2 Downloads Music pro Templates Trip3
dir1 doc3 file2 mypasswd PROJECTS Tmp1 Trips
dir2 DOCS Foods Pictures Public Tmp2 Videos
[nlauzon@server1 ~]$
```

2. Under the new directory DOCS create two subdirectories named FONT and KBD.

```
nlauzon@server1:~/DOCS$ ls -l |grep list
-rw-rw-r--. 1 nlauzon nlauzon 21 Feb 14 13:23 shopping_list
[nlauzon@server1 ~]$ ls
computers doc1 Downloads Music Public Tmp2 Videos
Desktop doc2 file2 mypasswd shopping_listTmp3
dir1 doc3 Foods Pictures Templates Trip3
dir2 Documents maintenance pro Tmp1 Trips
[nlauzon@server1 ~]$ mkdir DOCS PRINTS PROJECTS
[nlauzon@server1 ~]$ ls
computers doc1 Documents maintenance PRINTS shopping_list Tmp3
Desktop doc2 Downloads Music pro Templates Trip3
dir1 doc3 file2 mypasswd PROJECTS Tmp1 Trips
dir2 DOCS Foods Pictures Public Tmp2 Videos
[nlauzon@server1 ~]$ cd DOCS
[nlauzon@server1 DOCS]$ mkdir FONT KBD
[nlauzon@server1 DOCS]$ ls
FONT KBD
[nlauzon@server1 DOCS]$
```

3. Under the new directory PROJECTS create two subdirectories named HTML and

XML.

The terminal window shows the following session:

```
nlauzon@server1:~/PROJECTS
File Edit View Search Terminal Help
-rw-rw-r-- 1 nlauzon nlauzon 21 Feb 14 13:23 shopping_list
[nlauzon@server1 ~]$ ls
computers doc1      Downloads  Music    Public    Tmp2   Videos
Desktop   doc2      file2     mypasswd  shopping_list Tmp3
dir1      doc3      Foods     Pictures  Templates  Trip3
dir2      Documents maintenance pro     Tmp1       Trips
[nlauzon@server1 ~]$ mkdir DOCS PRINTS PROJECTS
[nlauzon@server1 ~]$ ls
computers doc1  Documents  maintenance  PRINTS  shopping_list  Tmp3
Desktop   doc2  Downloads  Music        pro    Templates   Trip3
dir1      doc3  file2     mypasswd    PROJECTS  Tmp1       Trips
dir2      DOCS  Foods     Pictures    Public    Tmp2       Videos
[nlauzon@server1 ~]$ cd DOCS
[nlauzon@server1 DOCS]$ mkdir FONT KBD
[nlauzon@server1 DOCS]$ ls
FONT  KBD
[nlauzon@server1 DOCS]$ cd~
bash: cd: command not found...
[nlauzon@server1 DOCS]$ cd ~
[nlauzon@server1 ~]$ cd PROJECTS
[nlauzon@server1 PROJECTS]$ mkdir HTML XML
[nlauzon@server1 PROJECTS]$ ls
HTML  XML
[nlauzon@server1 PROJECTS]$
```

4. Find all the directories starting with kbd under the /usr/share/doc directory and redirect the result to the file print4 under your PRINTS directory

The terminal window shows the following session:

```
nlauzon@server1:~
File Edit View Search Terminal Help
[nlauzon@server1 ~]$ find /usr/share/doc -type d -name "kbd*"
/usr/share/doc/kbd-1.15.5
[nlauzon@server1 ~]$ find /usr/share/doc -type d -name "kbd*" > PRINTS/print4
[nlauzon@server1 ~]$ cat PRINTS/print4
/usr/share/doc/kbd-1.15.5
[nlauzon@server1 ~]$
```

5. Copy the found directory (question 4) to your new directory DOCS (including its subdirectories and files)

Yes, I could have used the find command with the exec {} argument, but it was just easier to simply copy and paste the directory and filename that resulted from a previous command.

The screenshot shows a terminal window titled "nlauzon@server1:~". The user has navigated to the directory "/usr/share/doc/kbd-1.15.5". They run the command "cd -r /usr/share/doc/kbd-1.15.5 DOCS/" which results in an error message: "bash: cd: -r: invalid option". The user then runs "cp -r /usr/share/doc/kbd-1.15.5 DOCS/" followed by "ls DOCS/kbd-1.15.5". The output lists several files and directories, including "ANSI-dvorak.gif", "AUTHORS", "ChangeLog", "COPYING", "dvorak.diffs", "dvorak-l.xmodmap", "dvorak-r.xmodmap", "dvorak.txt", "dvorak.xmodmap", "font-formats-1.html", "font-formats-2.html", and various FAQ files like "FAQ-10.html" through "FAQ-23.html". A red circle highlights the list of files and directories in the terminal output.

```
nlauzon@server1:~$ cd -r /usr/share/doc/kbd-1.15.5 DOCS/
bash: cd: -r: invalid option
cd: usage: cd [-l|-P [-e]] [dir]
[nlauzon@server1 ~]$ cp -r /usr/share/doc/kbd-1.15.5 DOCS/
[nlauzon@server1 ~]$ ls DOCS/kbd-1.15.5
ANSI-dvorak.gif      font-formats-3.html   kbd.FAQ-17.html   kbd.FAQ-5.html
AUTHORS              font-formats-4.html   kbd.FAQ-18.html   kbd.FAQ-6.html
ChangeLog             font-formats-5.html   kbd.FAQ-19.html   kbd.FAQ-7.html
COPYING              font-formats.html    kbd.FAQ-1.html    kbd.FAQ-8.html
dvorak.diffs          kbd.FAQ-10.html    kbd.FAQ-20.html   kbd.FAQ-9.html
dvorak-l.xmodmap      kbd.FAQ-11.html    kbd.FAQ-21.html   kbd.FAQ.html
dvorak-r.xmodmap      kbd.FAQ-12.html    kbd.FAQ-22.html   README
dvorak.txt            kbd.FAQ-13.html    kbd.FAQ-23.html   utfdemo
dvorak.xmodmap        kbd.FAQ-14.html    kbd.FAQ-2.html    utflist
font-formats-1.html   kbd.FAQ-15.html    kbd.FAQ-3.html    kbd.FAQ-4.html
font-formats-2.html   kbd.FAQ-16.html    kbd.FAQ-4.html
```

6. Find all filenames starting with “font” and ending in “.html” under your home directory, and redirect the result to the file print6 under your PRINTS directory.

The screenshot shows a terminal window titled "nlauzon@server1:~". The user runs the command "find ~ -type f -name \"font*.html\" > PRINTS/print6". The output shows the path to each file found, such as "/home/nlauzon/DOCS/kbd-1.15.5/font-formats-1.html", "/home/nlauzon/DOCS/kbd-1.15.5/font-formats-2.html", and so on. A red circle highlights the list of files in the terminal output.

```
nlauzon@server1 ~]$ find ~ -type f -name "font*.html" > PRINTS/print6
[nlauzon@server1 ~]$ cat PRINTS/print6
/home/nlauzon/DOCS/kbd-1.15.5/font-formats-1.html
/home/nlauzon/DOCS/kbd-1.15.5/font-formats-2.html
/home/nlauzon/DOCS/kbd-1.15.5/font-formats-3.html
/home/nlauzon/DOCS/kbd-1.15.5/font-formats-4.html
/home/nlauzon/DOCS/kbd-1.15.5/font-formats-5.html
/home/nlauzon/DOCS/kbd-1.15.5/font-formats.html
```

7. Copy the found files (question 6) to your new subdirectory DOCS/FONT.

Just like question 5, I could have used the find command with the exec {} argument, but it was again easier to simply copy and paste the directory that resulted from a previous command and use a wildcard for the filenames.

A terminal window titled "nlauzon@server1:~". The session shows the user navigating to the DOCS directory and then creating a new directory named "FONT". They attempt to copy files from DOCS to FONT, but encounter errors due to non-existent directories. Finally, they list the contents of the DOCS directory, which includes files ending in .html from 1 to 5.

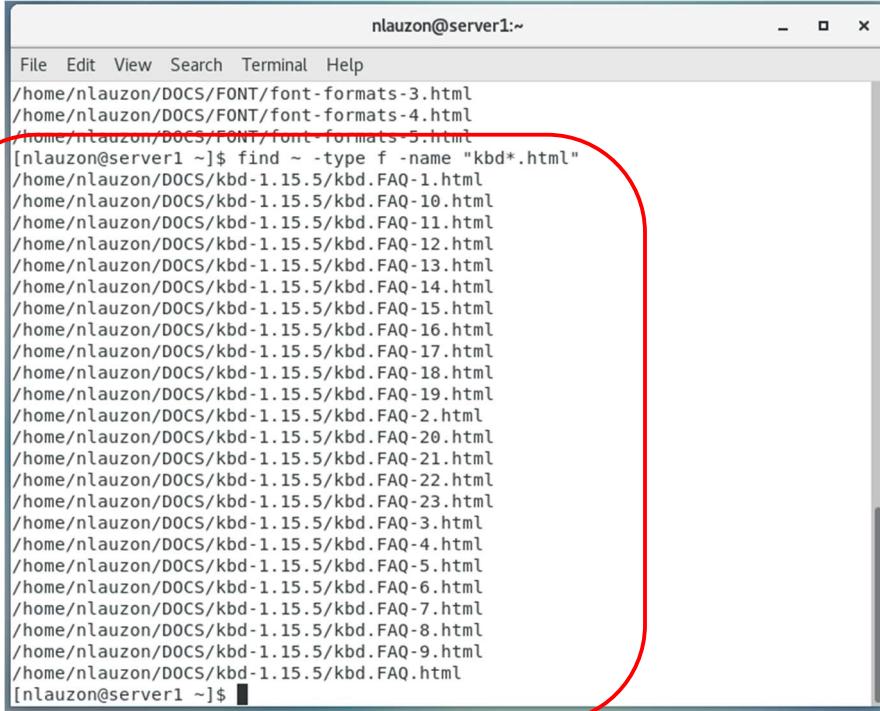
```
nlauzon@server1:~$ cd DOCS
nlauzon@server1:~/DOCS$ cp font*.html FONT
cp: cannot stat '/home/nlauzon/DOCS/font*.html': No such file or directory
nlauzon@server1:~/DOCS$ cp ~/DOCS/font*.html ~/DOCS/FONT
cp: cannot stat '/home/nlauzon/DOCS/font*.html': No such file or directory
nlauzon@server1:~/DOCS$ ls DOCS/FONT
nlauzon@server1:~/DOCS$ ls DOCS
FONT KBD kbd-1.15.5
nlauzon@server1:~/DOCS$ cd DOCS
nlauzon@server1:~/DOCS$ cp font*.html FONT
cp: cannot stat 'font*.html': No such file or directory
nlauzon@server1:~/DOCS$ cd ~
nlauzon@server1:~$ cp ~/DOCS/kbd-1.15.5/font*.html ~/DOCS/FONT/
cp: target '/home/nlauzon/DOCS/FONT/' is not a directory
nlauzon@server1:~$ cp ~/DOCS/kbd-1.15.5/font*.html ~/DOCS/FONT/
nlauzon@server1:~$ ls ~/DOCS/FONT/
ls: cannot access '/home/nlauzon/DOCS/FONT/': No such file or directory
nlauzon@server1:~$ ls ~/DOCS/FONT/
font-formats-1.html  font-formats-3.html  font-formats-5.html
font-formats-2.html  font-formats-4.html  font-formats.html
nlauzon@server1:~$
```

8. Display a long listing for the files ending in 2.html to 5.html under the subdirectory DOCS/FONT and redirect the result to the file print8 under your PRINTS directory

A terminal window titled "nlauzon@server1:~". The user runs a command to list files ending in .html from 2 to 5 in the DOCS/FONT directory, then pipes the output to a file named "print8" in the PRINTS directory. A red box highlights the command and its output.

```
nlauzon@server1:~$ ls -l ~DOCS/FONT/*[2-5].html > ~PRINTS/print8
bash: ~PRINTS/print8: No such file or directory
nlauzon@server1:~$ ls -l ~DOCS/FONT/*[2-5].html > ~/PRINTS/print8
nlauzon@server1:~$ cat ~/PRINTS/print8
-rw-r--r--. 1 nlauzon nlauzon 1479 Feb 26 12:33 /home/nlauzon/DOCS/FONT/font-formats-2.html
-rw-r--r--. 1 nlauzon nlauzon 7007 Feb 26 12:33 /home/nlauzon/DOCS/FONT/font-formats-3.html
-rw-r--r--. 1 nlauzon nlauzon 2198 Feb 26 12:33 /home/nlauzon/DOCS/FONT/font-formats-4.html
-rw-r--r--. 1 nlauzon nlauzon 517 Feb 26 12:33 /home/nlauzon/DOCS/FONT/font-formats-5.html
nlauzon@server1:~$
```

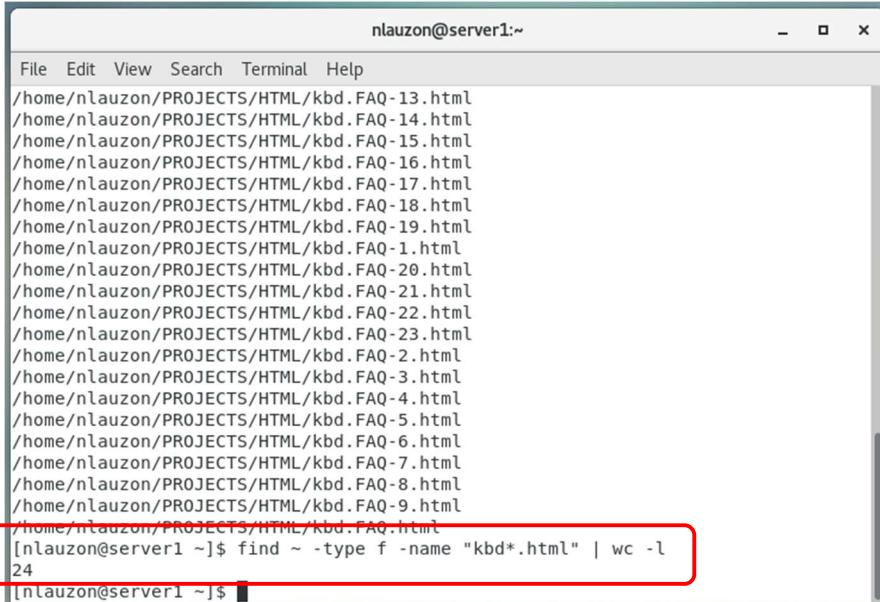
9. Under your home directory ,find all filenames starting with kbd and ending in “.html”



```
nlauzon@server1:~$ find ~ -type f -name "kbd*.html"
/home/nlauzon/DOCS/FONT/font-formats-3.html
/home/nlauzon/DOCS/FONT/font-formats-4.html
/home/nlauzon/DOCS/FONT/font-formats-5.html
[nlauzon@server1 ~]$ find ~ -type f -name "kbd*.html"
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-1.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-10.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-11.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-12.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-13.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-14.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-15.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-16.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-17.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-18.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-19.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-2.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-20.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-21.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-22.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-23.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-3.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-4.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-5.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-6.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-7.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-8.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ-9.html
/home/nlauzon/DOCS/kbd-1.15.5/kbd.FAQ.html
[nlauzon@server1 ~]$
```

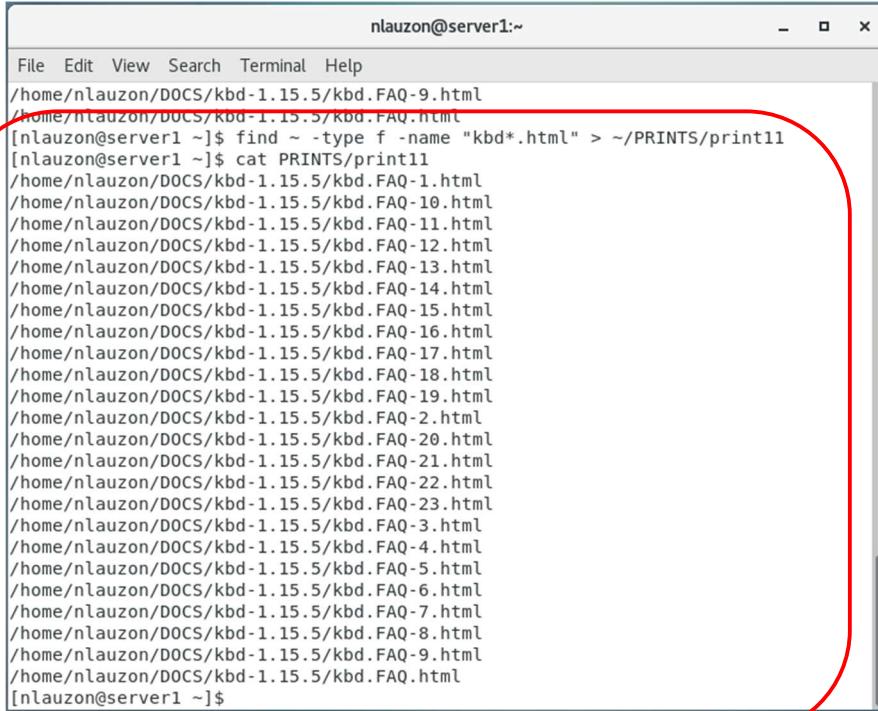
10. How many files did you find?

There are 24 of them:



```
nlauzon@server1:~$ find ~ -type f -name "kbd*.html" | wc -l
24
[nlauzon@server1 ~]$
```

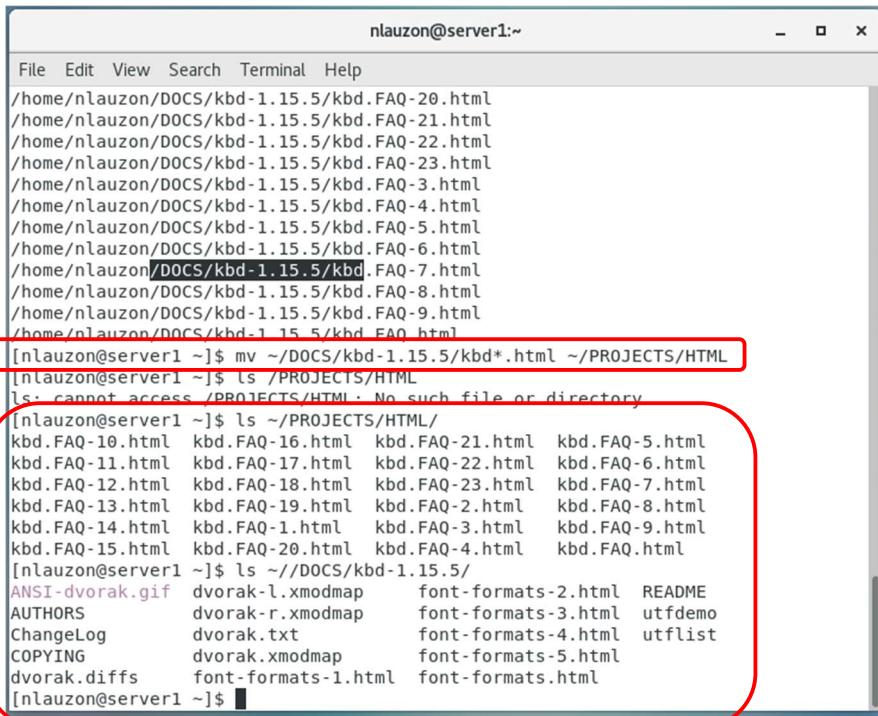
11. Redirect the result (question 9) to the file print11 under your PRINTS directory



```
nlauzon@server1:~$ find ~ -type f -name "kbd*.html" > ~/PRINTS/print11
```

The terminal window shows the command `find ~ -type f -name "kbd*.html" > ~/PRINTS/print11` being run. The output of the command, which lists all HTML files starting with "kbd" in the user's home directory, is shown in the window. A red circle highlights the entire output area.

12. Move all found files (question 9) to the subdirectory PROJECTS/HTML.



```
nlauzon@server1:~$ mv ~/DOCS/kbd-1.15.5/kbd*.html ~/PROJECTS/HTML
```

```
nlauzon@server1:~$ ls /PROJECTS/HTML
```

```
ls: cannot access /PROJECTS/HTML: No such file or directory
```

```
nlauzon@server1:~$ ls ~/PROJECTS/HTML/
```

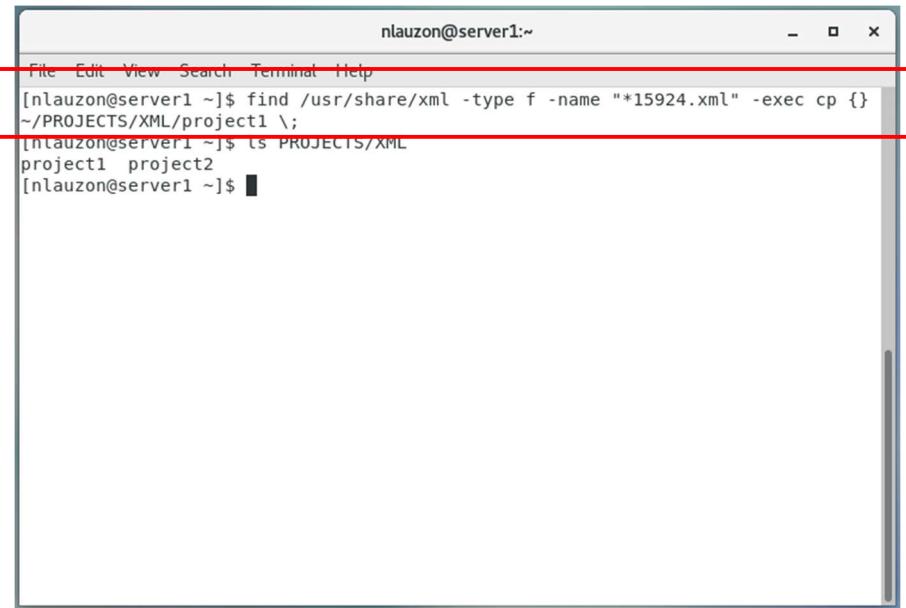
ANSI-dvorak.gif	dvorak-l.xmodmap	font-formats-2.html	README
AUTHORS	dvorak-r.xmodmap	font-formats-3.html	utfdemo
ChangeLog	dvorak.txt	font-formats-4.html	utflist
COPYING	dvorak.xmodmap	font-formats-5.html	
dvorak.diff	font-formats-1.html	font-formats.html	

```
[nlauzon@server1 ~]$
```

The terminal window shows the command `mv ~/DOCS/kbd-1.15.5/kbd*.html ~/PROJECTS/HTML` being run. It then shows the result of running `ls /PROJECTS/HTML`, which returns an error message about the directory not existing. Finally, it shows the contents of the `~/PROJECTS/HTML` directory, which contains several files and subfiles. A red circle highlights the command and its output.

13. Find the filename ending with “15924.xml“ under /usr/share/xml directory and copy the file to the subdirectory PROJECTS/XML and rename it project1

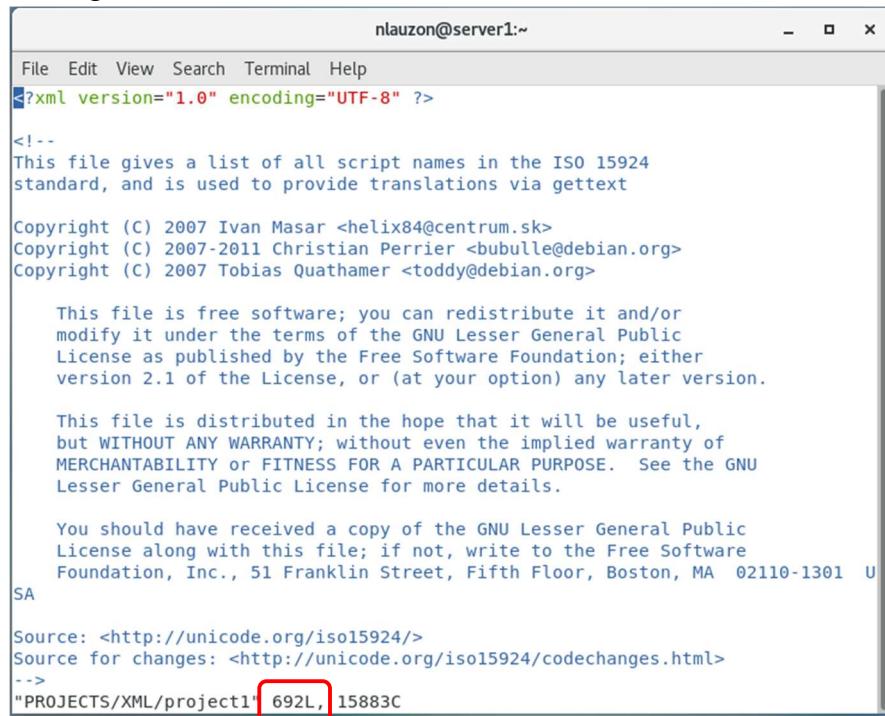
Of note, I first did it using two commands. A few days later I tried it using only one command, as shown above, to prove to myself and to you that I could do it. That is why project2 shows up with ls, even though that file is addressed in a subsequent question.



```
nlauzon@server1:~  
File Edit View Search Terminal Help  
[nlauzon@server1 ~]$ find /usr/share/xml -type f -name "*15924.xml" -exec cp {} ~/PROJECTS/XML/project1 \;  
[nlauzon@server1 ~]$ ls PROJECTS/XML  
project1 project2  
[nlauzon@server1 ~]$
```

14. Display the file project1

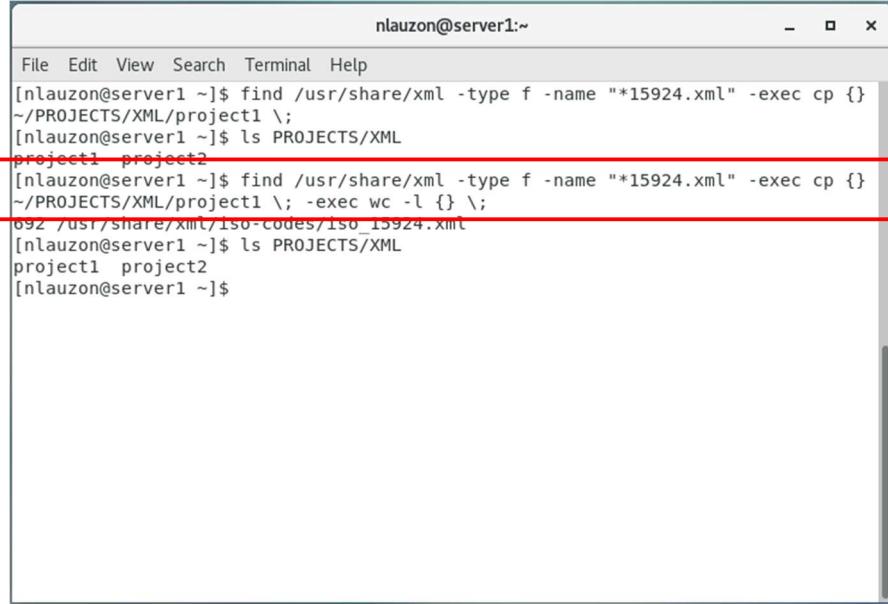
Through vi:



```
nlauzon@server1:~  
File Edit View Search Terminal Help  
<?xml version="1.0" encoding="UTF-8" ?>  
  
<!--  
This file gives a list of all script names in the ISO 15924  
standard, and is used to provide translations via gettext  
  
Copyright (C) 2007 Ivan Masar <helix84@centrum.sk>  
Copyright (C) 2007-2011 Christian Perrier <bubulle@debian.org>  
Copyright (C) 2007 Tobias Quathamer <toddy@debian.org>  
  
This file is free software; you can redistribute it and/or  
modify it under the terms of the GNU Lesser General Public  
License as published by the Free Software Foundation; either  
version 2.1 of the License, or (at your option) any later version.  
  
This file is distributed in the hope that it will be useful,  
but WITHOUT ANY WARRANTY; without even the implied warranty of  
MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU  
Lesser General Public License for more details.  
  
You should have received a copy of the GNU Lesser General Public  
License along with this file; if not, write to the Free Software  
Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA  
  
Source: <http://unicode.org/iso15924/>  
Source for changes: <http://unicode.org/iso15924/codechanges.html>  
-->  
"PROJECTS/XML/project1" 692L, 15883C
```

15. How many lines has this file?

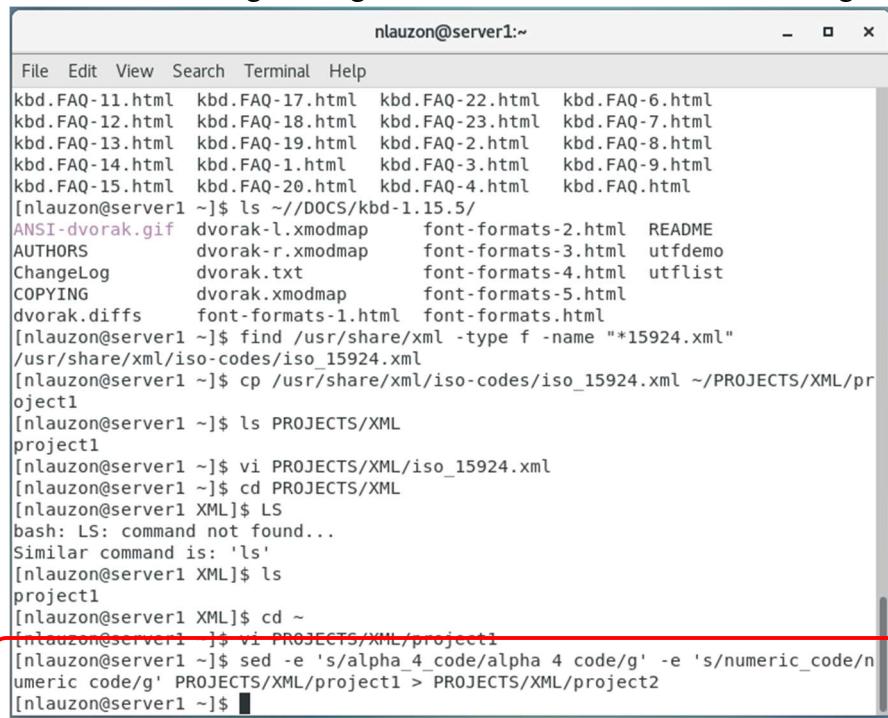
Through vi, 692 lines are counted (see question 14). Questions 13 and 15 can be answered using a simple command line, as shown below (command find with 2 -exec {} in succession):



```
nlauzon@server1:~$ find /usr/share/xml -type f -name "*15924.xml" -exec cp {} ~/PROJECTS/XML/project1 ;  
[nlauzon@server1 ~]$ ls PROJECTS/XML  
project1 project2  
[nlauzon@server1 ~]$ find /usr/share/xml -type f -name "*15924.xml" -exec cp {} ~/PROJECTS/XML/project1 \; -exec wc -l {} \;  
692 /usr/share/xml/iso-codes/iso_15924.xml  
[nlauzon@server1 ~]$ ls PROJECTS/XML  
project1 project2  
[nlauzon@server1 ~]$
```

16. In project1, use a single command to replace “alpha_4_code” with “alpha 4 code” and “numeric_code” with “numeric code” then save the change in a new file named project2 under the XML directory.

The command is in the screen below, using option -e, which we did not see in class, but does the same as ‘s/ / /g; s/ / /g’. The result is shown in the following screen, using vi.



```
nlauzon@server1:~$ ls ~/DOCS/kbd-1.15.5/  
kbd.FAQ-11.html kbd.FAQ-17.html kbd.FAQ-22.html kbd.FAQ-6.html  
kbd.FAQ-12.html kbd.FAQ-18.html kbd.FAQ-23.html kbd.FAQ-7.html  
kbd.FAQ-13.html kbd.FAQ-19.html kbd.FAQ-2.html kbd.FAQ-8.html  
kbd.FAQ-14.html kbd.FAQ-1.html kbd.FAQ-3.html kbd.FAQ-9.html  
kbd.FAQ-15.html kbd.FAQ-20.html kbd.FAQ-4.html kbd.FAQ.html  
[nlauzon@server1 ~]$ ls ~/DOCS/kbd-1.15.5/  
ANSI-dvorak.gif dvorak-l.xmodmap font-formats-2.html README  
AUTHORS dvorak-r.xmodmap font-formats-3.html utfdemo  
ChangeLog dvorak.txt font-formats-4.html utflist  
COPYING dvorak.xmodmap font-formats-5.html  
dvorak.diffs font-formats-1.html font-formats.html  
[nlauzon@server1 ~]$ find /usr/share/xml -type f -name "*15924.xml"  
/usr/share/xml/iso-codes/iso_15924.xml  
[nlauzon@server1 ~]$ cp /usr/share/xml/iso-codes/iso_15924.xml ~/PROJECTS/XML/project1  
[nlauzon@server1 ~]$ ls PROJECTS/XML  
project1  
[nlauzon@server1 ~]$ vi PROJECTS/XML/iso_15924.xml  
[nlauzon@server1 ~]$ cd PROJECTS/XML  
[nlauzon@server1 XML]$ LS  
bash: LS: command not found...  
Similar command is: 'ls'  
[nlauzon@server1 XML]$ ls  
project1  
[nlauzon@server1 XML]$ cd ~  
[nlauzon@server1 ~]$ vi PROJECTS/XML/project1  
[nlauzon@server1 ~]$ sed -e 's/alpha_4_code/alpha 4 code/g' -e 's/numeric_code/numeric code/g' PROJECTS/XML/project1 > PROJECTS/XML/project2  
[nlauzon@server1 ~]$
```

```

nlauzon@server1:~
```

File Edit View Search Terminal Help

```

<!ELEMENT iso_15924_entry EMPTY>
<!ATTLIST iso_15924_entry
    alpha 4 code   CDATA #REQUIRED
    numeric code   CDATA #REQUIRED
    name          CDATA #REQUIRED
  >

]>

<iso_15924_entries>
  <iso_15924_entry
    alpha 4 code="Afak"
    numeric code="439"
    name="Afaka" />
  <iso_15924_entry
    alpha 4 code="Aghb"
    numeric code="239"
    name="Caucasian Albanian" />
  <iso_15924_entry
    alpha 4 code="Arab"
    numeric code="160"
    name="Arabic" />
  <iso_15924_entry
    alpha 4 code="Armi"
    numeric code="124"
    name="Imperial Aramaic" />
  <iso_15924_entry
    alpha 4 code="Armn"
    numeric code="230" />
```

58,1-8 4%

17. Copy the file /etc/services to your home directory and rename it myservices

```

nlauzon@server1:~
```

File Edit View Search Terminal Help

```

[nlauzon@server1 ~]$ vi PROJECTS/XML/iso_15924.xml
[nlauzon@server1 ~]$ cd PROJECTS/XML
[nlauzon@server1 XML]$ LS
bash: LS: command not found...
Similar command is: 'ls'
[nlauzon@server1 XML]$ ls
project1
[nlauzon@server1 XML]$ cd ~
[nlauzon@server1 ~]$ vi PROJECTS/XML/project1
[nlauzon@server1 ~]$ sed -e 's/alpha_4_code/alpha 4 code/g' -e 's/numeric_code/numeric code/g' PROJECTS/XML/project1 > PROJECTS/XML/project2
[nlauzon@server1 ~]$ vi PROJECTS/XML/project2
[nlauzon@server1 ~]$ cd /etc/services ~myservices
bash: cd: /etc/services: Not a directory
[nlauzon@server1 ~]$ cp /etc/services ~myservices
[nlauzon@server1 ~]$ ls
computers doc1 Documents maintenance Pictures Public Tmp2 Videos
Desktop doc2 Downloads Music PRINTS shopping_list Tmp3
dir1 doc3 file2 mypasswd pro Templates Trip3
dir2 DOCS Foods ~myservices PROJECTS Tmpl Trips
[nlauzon@server1 ~]$ rm -i ~myservices
rm: remove regular file '~myservices'? y
[nlauzon@server1 ~]$ cp /etc/services myservices
[nlauzon@server1 ~]$ ls
computers doc1 Documents maintenance Pictures Public Tmp2 Videos
Desktop doc2 Downloads Music PRINTS shopping_list Tmp3
dir1 doc3 file2 mypasswd pro Templates Trip3
dir2 DOCS Foods myservices PROJECTS Tmpl Trips
[nlauzon@server1 ~]$
```

18. Display the content of the new file myservices using cat, more and less

With **cat myservices**, listing all from the beginning, and scrolling down nonstop to the end:

```

nlauzon@server1:~ File Edit View Search Terminal Help
directplaysrvr 47624/tcp      # Direct Play Server
directplaysrvr 47624/udp      # Direct Play Server
ap             47806/tcp      # ALC Protocol
ap             47806/udp      # ALC Protocol
bacnet          47808/tcp      # Building Automation and Control Network
ks             47808/udp      # Building Automation and Control Network
ks             47808/udp      # Building Automation and Control Network
nimcontroller  48000/tcp      # Nimbus Controller
nimcontroller  48000/udp      # Nimbus Controller
nimspooler     48001/tcp      # Nimbus Spooler
nimspooler     48001/udp      # Nimbus Spooler
nimhub          48002/tcp      # Nimbus Hub
nimhub          48002/udp      # Nimbus Hub
nimgtw          48003/tcp      # Nimbus Gateway
nimgtw          48003/udp      # Nimbus Gateway
nimbusdb        48004/tcp      # NimbusDB Connector
nimbusdbctrl   48005/tcp      # NimbusDB Control
3gpp-cbsp      48049/tcp      # 3GPP Cell Broadcast Service Protocol
isnetserv       48128/tcp      # Image Systems Network Services
isnetserv       48128/udp      # Image Systems Network Services
blp5            48129/tcp      # Bloomberg locator
blp5            48129/udp      # Bloomberg locator
com-bardac-dw  48556/tcp      # com-bardac-dw
com-bardac-dw  48556/udp      # com-bardac-dw
iqobject        48619/tcp      # iqobject
iqobject        48619/udp      # iqobject
matahari        49000/tcp      # Matahari Broker
[nlauzon@server1 ~]$ █

```

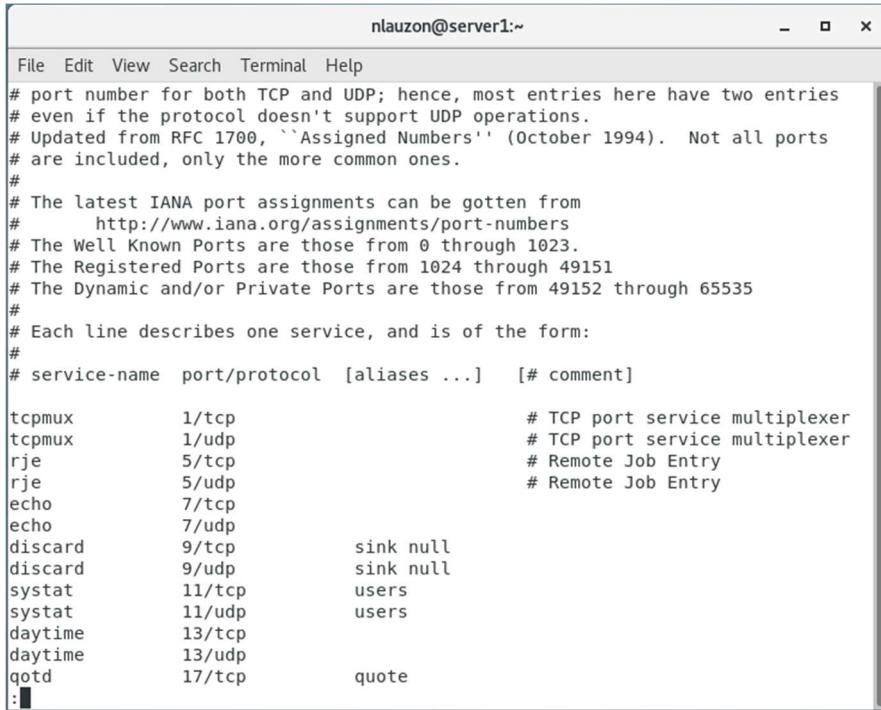
With **more myservices**, this is not a scroll down to the end, it fills the screen but no more, and I can move down gradually with the spacebar and enter keys, but I cannot go back up:

```

nlauzon@server1:~ File Edit View Search Terminal Help
# IANA services version: last updated 2013-04-10
#
# Note that it is presently the policy of IANA to assign a single well-known
# port number for both TCP and UDP; hence, most entries here have two entries
# even if the protocol doesn't support UDP operations.
# Updated from RFC 1700, ``Assigned Numbers'' (October 1994). Not all ports
# are included, only the more common ones.
#
# The latest IANA port assignments can be gotten from
#     http://www.iana.org/assignments/port-numbers
# The Well Known Ports are those from 0 through 1023.
# The Registered Ports are those from 1024 through 49151
# The Dynamic and/or Private Ports are those from 49152 through 65535
#
# Each line describes one service, and is of the form:
#
# service-name  port/protocol  [aliases ...]  [# comment]
tcpmux         1/tcp           # TCP port service multiplexer
tcpmux         1/udp           # TCP port service multiplexer
rje            5/tcp           # Remote Job Entry
rje            5/udp           # Remote Job Entry
echo           7/tcp           sink null
echo           7/udp           sink null
discard        9/tcp           sink null
discard        9/udp           sink null
sysstat        11/tcp          users
sysstat        11/udp          users
--More--(0%) █

```

With **less myservices**, it is just like more, but I have more freedom of movement since I can move back up if I want:



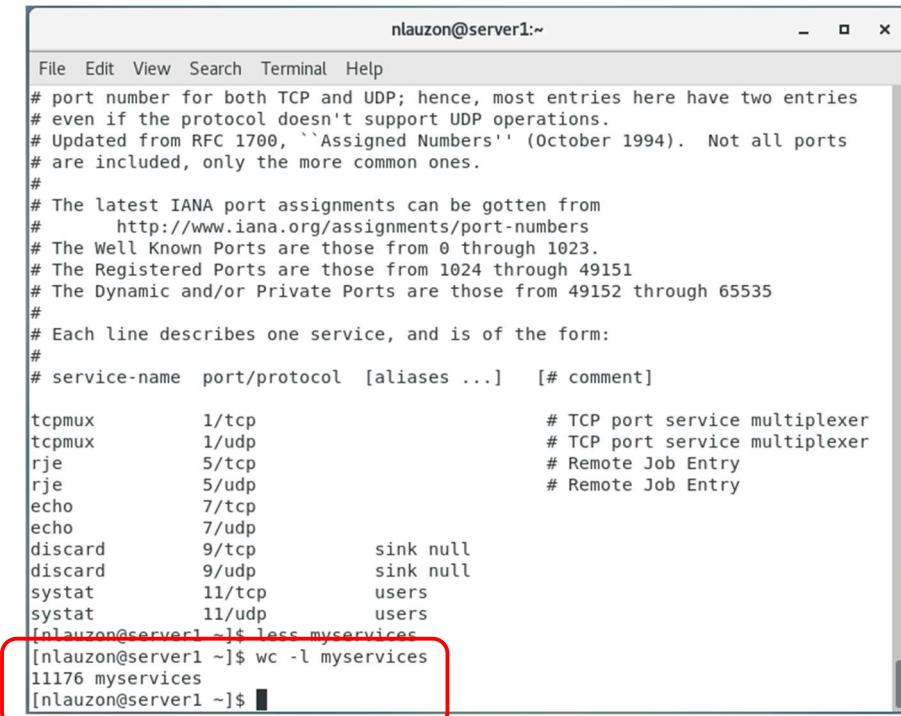
nlauzon@server1:~

```
# port number for both TCP and UDP; hence, most entries here have two entries
# even if the protocol doesn't support UDP operations.
# Updated from RFC 1700, ``Assigned Numbers'' (October 1994). Not all ports
# are included, only the more common ones.
#
# The latest IANA port assignments can be gotten from
#     http://www.iana.org/assignments/port-numbers
# The Well Known Ports are those from 0 through 1023.
# The Registered Ports are those from 1024 through 49151
# The Dynamic and/or Private Ports are those from 49152 through 65535
#
# Each line describes one service, and is of the form:
#
# service-name    port/protocol [aliases ...] [# comment]

tcpmux      1/tcp          # TCP port service multiplexer
tcpmux      1/udp          # TCP port service multiplexer
rje         5/tcp          # Remote Job Entry
rje         5/udp          # Remote Job Entry
echo        7/tcp
echo        7/udp
discard    9/tcp          sink null
discard    9/udp          sink null
systat     11/tcp         users
systat     11/udp         users
daytime    13/tcp
daytime    13/udp
qotd       17/tcp         quote
:
```

19. Count the number of lines in the new file myservices

A total of 11176 line is counted with wordcount (wc):



nlauzon@server1:~

```
# port number for both TCP and UDP; hence, most entries here have two entries
# even if the protocol doesn't support UDP operations.
# Updated from RFC 1700, ``Assigned Numbers'' (October 1994). Not all ports
# are included, only the more common ones.
#
# The latest IANA port assignments can be gotten from
#     http://www.iana.org/assignments/port-numbers
# The Well Known Ports are those from 0 through 1023.
# The Registered Ports are those from 1024 through 49151
# The Dynamic and/or Private Ports are those from 49152 through 65535
#
# Each line describes one service, and is of the form:
#
# service-name    port/protocol [aliases ...] [# comment]

tcpmux      1/tcp          # TCP port service multiplexer
tcpmux      1/udp          # TCP port service multiplexer
rje         5/tcp          # Remote Job Entry
rje         5/udp          # Remote Job Entry
echo        7/tcp
echo        7/udp
discard    9/tcp          sink null
discard    9/udp          sink null
systat     11/tcp         users
systat     11/udp         users
[nlauzon@server1 ~]$ less myservices
[nlauzon@server1 ~]$ wc -l myservices
11176 myservices
[nlauzon@server1 ~]$
```

20. In myservices file, replace “tcp” with “ TCP ” and “udp” with “UDP” and save the change in a new file named newservices.

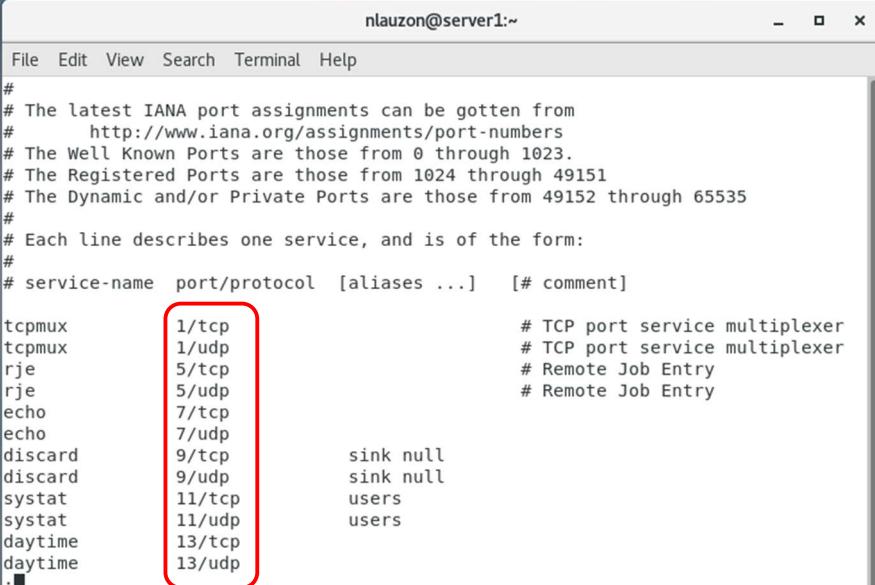
Replacements made with sed, as shown below:



```
nlauzon@server1:~$ sed -e 's/tcp/TCP/g' -e 's/udp/UDP/g' myservices > newservices
[nlauzon@server1 ~]$
```

A screenshot of a terminal window titled "nlauzon@server1:~". The window contains a single command: "sed -e 's/tcp/TCP/g' -e 's/udp/UDP/g' myservices > newservices". The entire command line is highlighted with a red rectangle.

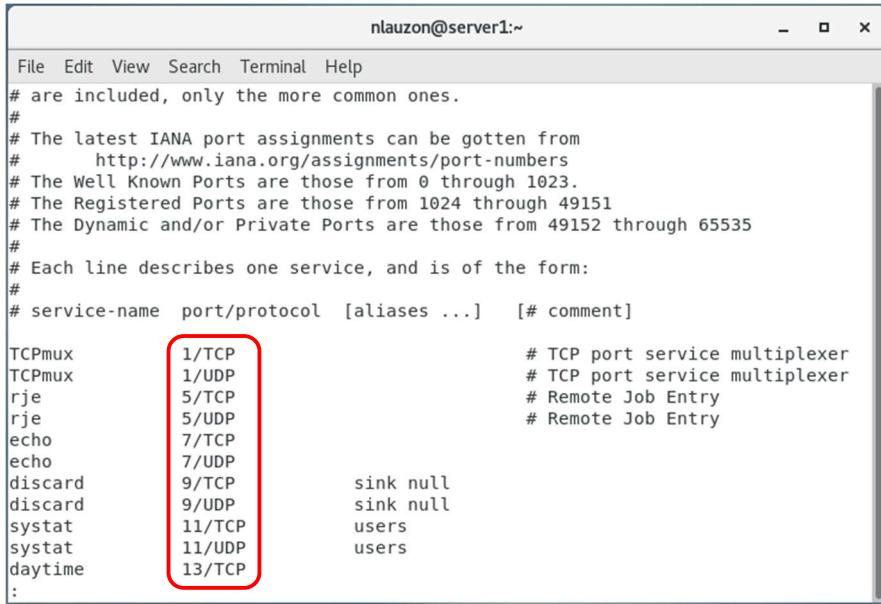
Using less, we can see the original content in myservices:



```
nlauzon@server1:~$ less myservices
#
# The latest IANA port assignments can be gotten from
#      http://www.iana.org/assignments/port-numbers
# The Well Known Ports are those from 0 through 1023.
# The Registered Ports are those from 1024 through 49151
# The Dynamic and/or Private Ports are those from 49152 through 65535
#
# Each line describes one service, and is of the form:
#
# service-name  port/protocol  [aliases ...]  [# comment]
#
tcpmux          1/tcp           # TCP port service multiplexer
tcpmux          1/udp           # TCP port service multiplexer
rje             5/tcp           # Remote Job Entry
rje             5/udp           # Remote Job Entry
echo            7/tcp           sink null
echo            7/udp           sink null
discard         9/tcp           users
discard         9/udp           users
systat          11/tcp          users
systat          11/udp          users
daytime         13/tcp          users
daytime         13/udp          users
:|
```

A screenshot of a terminal window titled "nlauzon@server1:~\$ less myservices". The file content is displayed in a scrollable window. A red rectangle highlights the first few lines of the file, which define port assignments for various services like tcpmux, rje, echo, and discard.

Then below are the replacements in newservices:



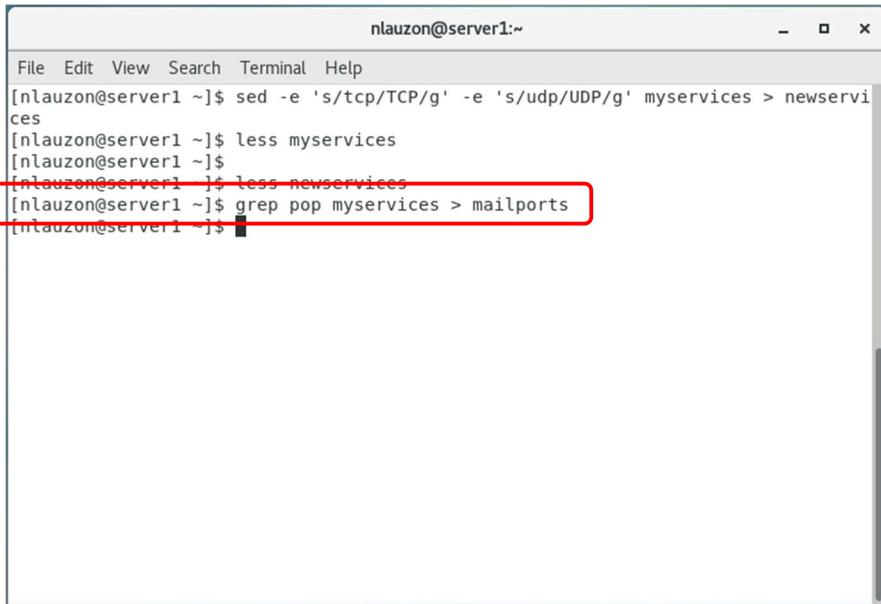
```
nlauzon@server1:~
```

```
File Edit View Search Terminal Help
# are included, only the more common ones.
#
# The latest IANA port assignments can be gotten from
#     http://www.iana.org/assignments/port-numbers
# The Well Known Ports are those from 0 through 1023.
# The Registered Ports are those from 1024 through 49151
# The Dynamic and/or Private Ports are those from 49152 through 65535
#
# Each line describes one service, and is of the form:
#
# service-name    port/protocol  [aliases ...]  [# comment]

TCPmux          1/TCP          # TCP port service multiplexer
TCPmux          1/UDP          # TCP port service multiplexer
rje             5/TCP          # Remote Job Entry
rje             5/UDP          # Remote Job Entry
echo            7/TCP          sink null
echo            7/UDP          sink null
discard         9/TCP          users
discard         9/UDP          users
systat          11/TCP         users
systat          11/UDP         users
daytime         13/TCP         users
:
```

21. Search all the lines containing the word “ pop ” in the file myservices and redirect the output to a new file named mailports.

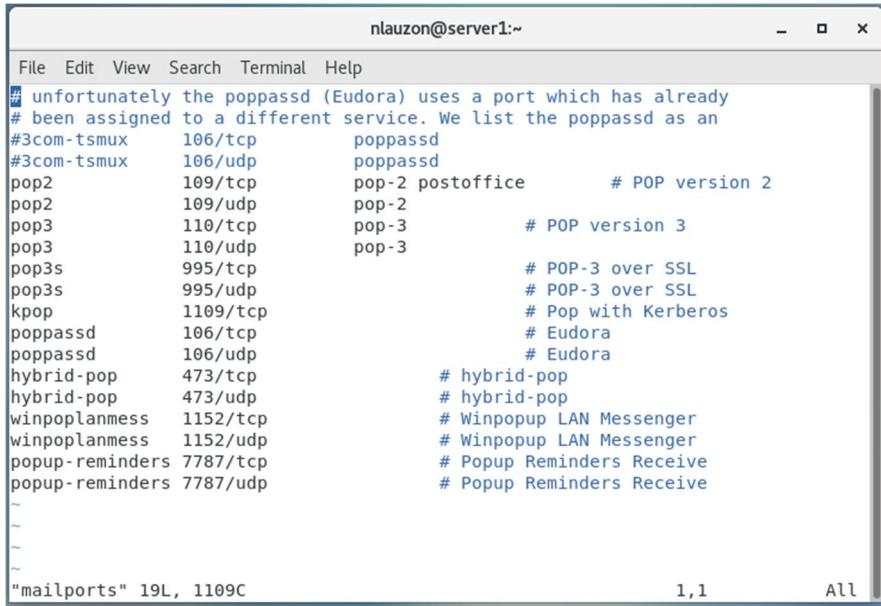
Below is the command:



```
nlauzon@server1:~
```

```
File Edit View Search Terminal Help
[nlauzon@server1 ~]$ sed -e 's/tcp/TCP/g' -e 's/udp/UDP/g' myservices > newservices
[nlauzon@server1 ~]$ less myservices
[nlauzon@server1 ~$]
[nlauzon@server1 ~]$ less newservices
[nlauzon@server1 ~$] grep pop myservices > mailports
[nlauzon@server1 ~$]
```

And below are the results in mailports, using vi:



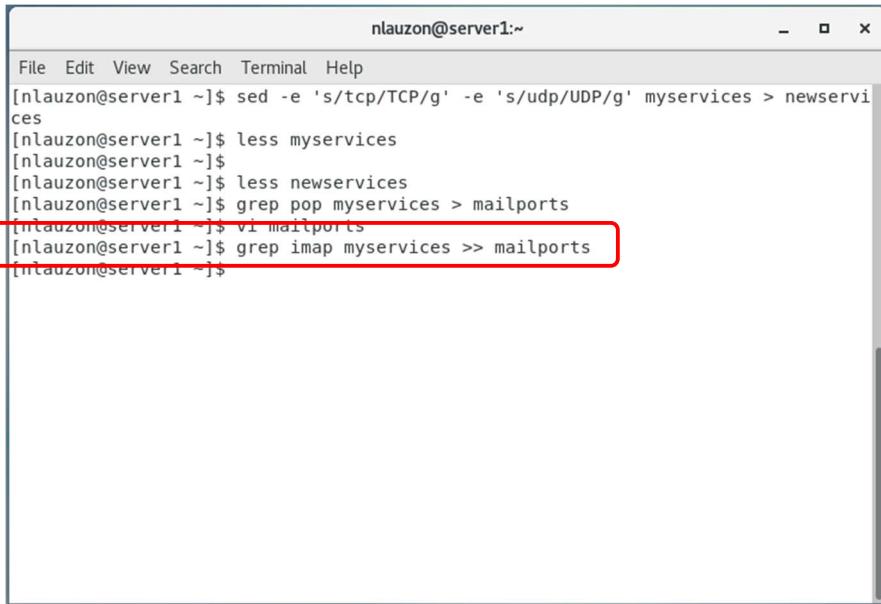
The terminal window shows the following content:

```
nlauzon@server1:~$ cat mailports
# unfortunately the poppassd (Eudora) uses a port which has already
# been assigned to a different service. We list the poppassd as an
#3com-tsmux 106/tcp      poppassd
#3com-tsmux 106/udp     poppassd
pop2       109/tcp      pop-2 postoffice      # POP version 2
pop2       109/udp     pop-2
pop3       110/tcp      pop-3                  # POP version 3
pop3       110/udp     pop-3
pop3s      995/tcp      # POP-3 over SSL
pop3s      995/udp     # POP-3 over SSL
kpop       1109/tcp     # Pop with Kerberos
popassd    106/tcp      # Eudora
popassd    106/udp     # Eudora
hybrid-pop 473/tcp     # hybrid-pop
hybrid-pop 473/udp     # hybrid-pop
winpoplanmess 1152/tcp   # Winpopup LAN Messenger
winpoplanmess 1152/udp   # Winpopup LAN Messenger
popup-reminders 7787/tcp # Popup Reminders Receive
popup-reminders 7787/udp # Popup Reminders Receive
~
~
~
~

"mailports" 19L, 1109C
```

22. Search all the lines containing the word “ imap ” in the file myservices and append the output to the file mailports.

Below is the command:



The terminal window shows the following command sequence:

```
[nlauzon@server1 ~]$ sed -e 's/tcp/TCP/g' -e 's/udp/UDP/g' myservices > newservices
[nlauzon@server1 ~]$ less myservices
[nlauzon@server1 ~]$
[nlauzon@server1 ~]$ less newservices
[nlauzon@server1 ~]$ grep pop myservices > mailports
[nlauzon@server1 ~]$ vi mailports
[nlauzon@server1 ~]$ grep imap myservices >> mailports
[nlauzon@server1 ~]$
```

And below are the results in mailports, using vi:

```

nlauzon@server1:~          - □ ×
File Edit View Search Terminal Help
pop2      109/tcp      pop-2 postoffice      # POP version 2
pop2      109/udp      pop-2
pop3      110/tcp      pop-3      # POP version 3
pop3      110/udp      pop-3
pop3s     995/tcp      # POP-3 over SSL
pop3s     995/udp      # POP-3 over SSL
kpop      1109/tcp     # Pop with Kerberos
popassd   106/tcp      # Eudora
popassd   106/udp      # Eudora
hybrid-pop 473/tcp    # hybrid-pop
hybrid-pop 473/udp    # hybrid-pop
winpoplanmess 1152/tcp # Winpopup LAN Messenger
winpoplanmess 1152/udp # Winpopup LAN Messenger
popup-reminders 7787/tcp # Popup Reminders Receive
popup-reminders 7787/udp # Popup Reminders Receive
imap      143/tcp      imap2      # Interim Mail Access Proto v2
imap      143/udp      imap2
imap3     220/tcp      # Interactive Mail Access
imap3     220/udp      # Protocol v3
imaps     993/tcp      # IMAP over SSL
imaps     993/udp      # IMAP over SSL
berknet   2005/tcp     csync      # csync for cyrus-imapd
oracle    2005/udp     csync      # csync for cyrus-imapd
27,1           Bot

```

23. Using vi edit the file mailports. Remove all comments, “#” and “/ “. Keep only the services names in the first column, the port numbers in the second column and the protocols in the third column as : imap 143 tcp

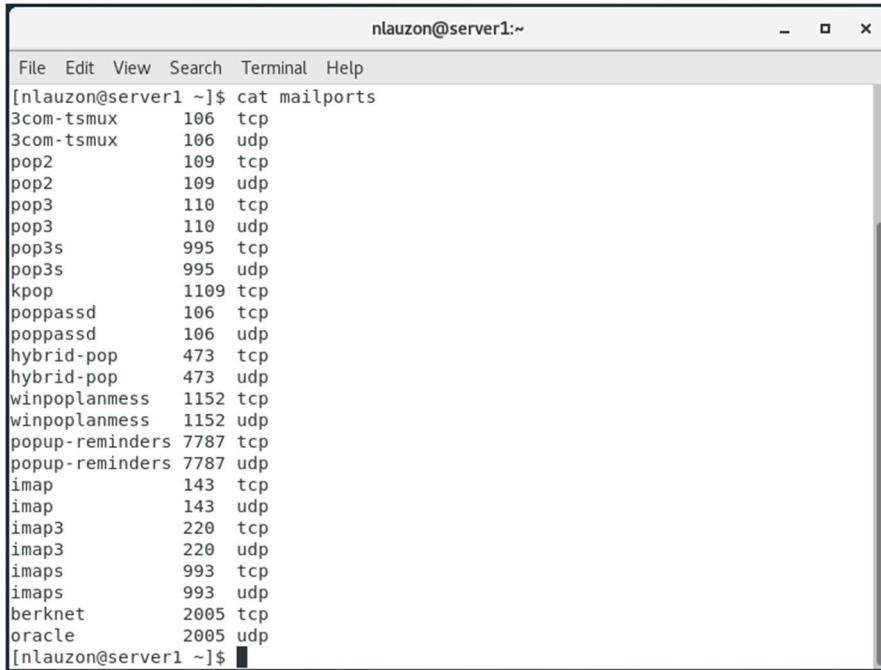
I believe this is what you are looking for, below. Given the small size of the file, and that there was no clear coherence in the elements to remove, I did the edits by hand (e.x., no substitution commands employed).

```

nlauzon@server1:~          - □ ×
File Edit View Search Terminal Help
3com-tsmux 106 tcp
3com-tsmux 106 udp
pop2 109 tcp
pop2 109 udp
pop3 110 tcp
pop3 110 udp
pop3s 995 tcp
pop3s 995 udp
kpop 1109 tcp
popassd 106 tcp
popassd 106 udp
hybrid-pop 473 tcp
hybrid-pop 473 udp
winpoplanmess 1152 tcp
winpoplanmess 1152 udp
popup-reminders 7787 tcp
popup-reminders 7787 udp
imap 143 tcp
imap 143 udp
imap3 220 tcp
imap3 220 udp
imaps 993 tcp
imaps 993 udp
berknet 2005 tcp
oracle 2005 udp
-
-- INSERT --
1,22           All

```

A quick check of the results, using cat:

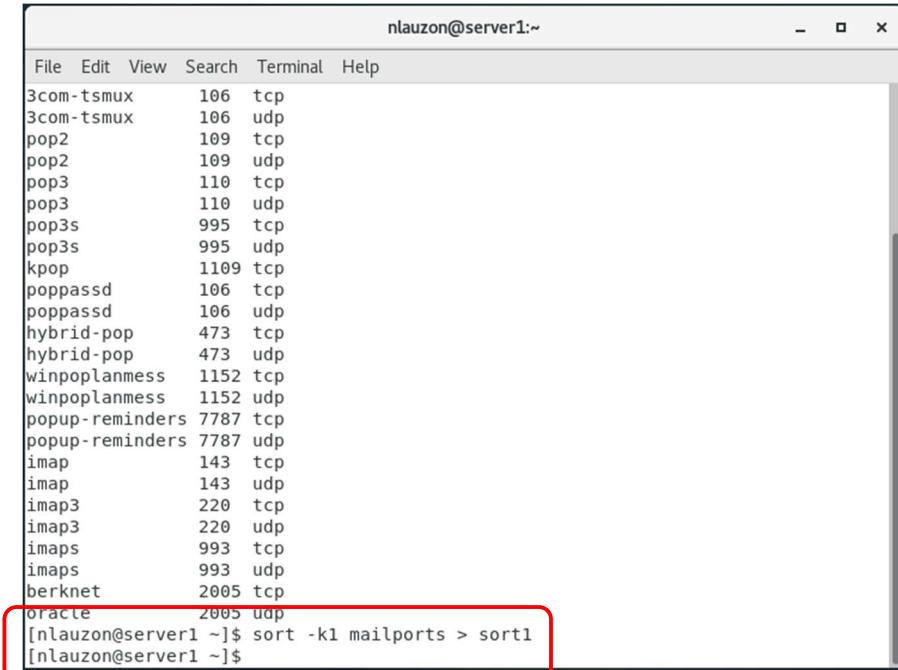


A terminal window titled "nlauzon@server1:~". The command "cat mailports" is run, displaying a list of port mappings. The output is as follows:

```
nlauzon@server1 ~]$ cat mailports
3com-tsmux      106  tcp
3com-tsmux      106  udp
pop2            109  tcp
pop2            109  udp
pop3            110  tcp
pop3            110  udp
pop3s           995  tcp
pop3s           995  udp
kpop             1109 tcp
poppassd        106  tcp
poppassd        106  udp
hybrid-pop     473  tcp
hybrid-pop     473  udp
winpoplanmess  1152 tcp
winpoplanmess  1152 udp
popup-reminders 7787 tcp
popup-reminders 7787 udp
imap             143  tcp
imap             143  udp
imap3            220  tcp
imap3            220  udp
imaps            993  tcp
imaps            993  udp
berknet          2005 tcp
oracle           2005 udp
[nlauzon@server1 ~]$
```

24. Sort the file mailports by service name (1st column) and redirect the output to a new file named sort1. Verify the content of the file sort1.

Below is the command:



A terminal window titled "nlauzon@server1:~". The command "sort -k1 mailports > sort1" is run, sorting the "mailports" file by the first column (service name). The output is as follows:

```
nlauzon@server1 ~]$ sort -k1 mailports > sort1
[nlauzon@server1 ~]$ [nlauzon@server1 ~]$
```

The last two lines of the terminal session are highlighted with a red rectangle.

And below are the results in sort1:

```
nlauzon@server1:~$ cat sort1
3com-tsmux      106  tcp
3com-tsmux      106  udp
berknet         2005 tcp
hybrid-pop     473  tcp
hybrid-pop     473  udp
imap            143  tcp
imap            143  udp
imap3           220  tcp
imap3           220  udp
imaps          993  tcp
imaps          993  udp
kpop            1109 tcp
oracle          2005 udp
pop2            109  tcp
pop2            109  udp
pop3            110  tcp
pop3            110  udp
pop3s           995  tcp
pop3s           995  udp
popassd         106  tcp
popassd         106  udp
popup-reminders 7787 tcp
popup-reminders 7787 udp
winpoplanmess   1152 tcp
winpoplanmess   1152 udp
[nlauzon@server1 ~]$
```

25. Sort the file mailports by port number (2nd column) and redirect the output to a new file named sort2. Verify the content of the file sort2.

Below is the command, in numerical order this time:

```
nlauzon@server1:~$ sort -k2n mailports > sort2
[nlauzon@server1 ~]$
```

And below are the results in sort2:

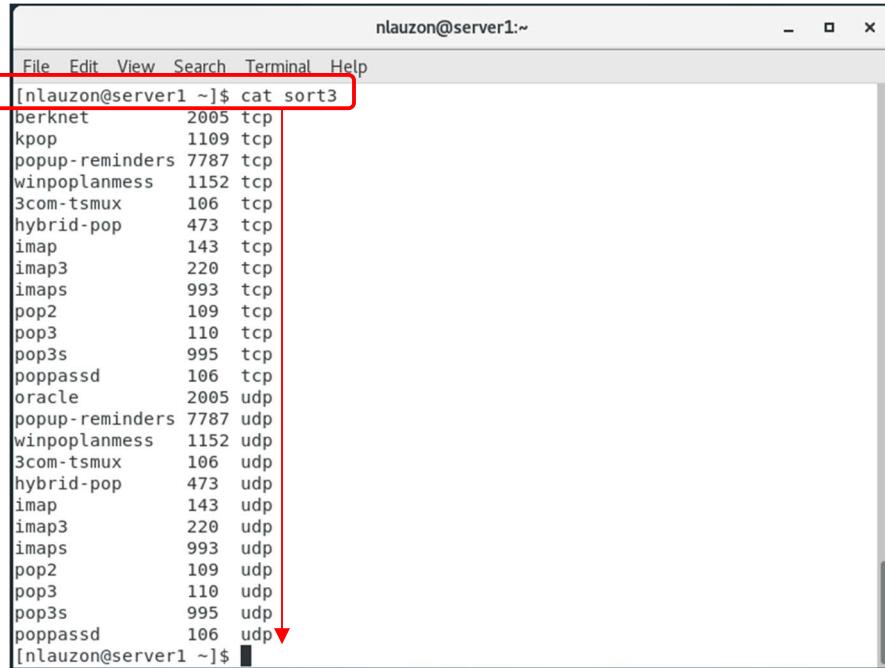
```
nlauzon@server1:~$ cat sort2
3com-tsmux      106  tcp
3com-tsmux      106  udp
popassd         106  tcp
popassd         106  udp
pop2            109  tcp
pop2            109  udp
pop3            110  tcp
pop3            110  udp
imap             143  tcp
imap             143  udp
imap3           220  tcp
imap3           220  udp
hybrid-pop     473  tcp
hybrid-pop     473  udp
imaps            993  tcp
imaps            993  udp
pop3s           995  tcp
pop3s           995  udp
kpop             1109 tcp
winpoplanmess   1152 tcp
winpoplanmess   1152 udp
berknet          2005 tcp
oracle            2005 udp
popup-reminders 7787 tcp
popup-reminders 7787 udp
[nlauzon@server1 ~]$
```

26. Sort the file mailports by protocol (3rd column) and redirect the output to a new file named sort3. Verify the content of the file sort3.

Below is the command:

```
nlauzon@server1:~$ sort -k3 mailports > sort3
[nlauzon@server1 ~]$
```

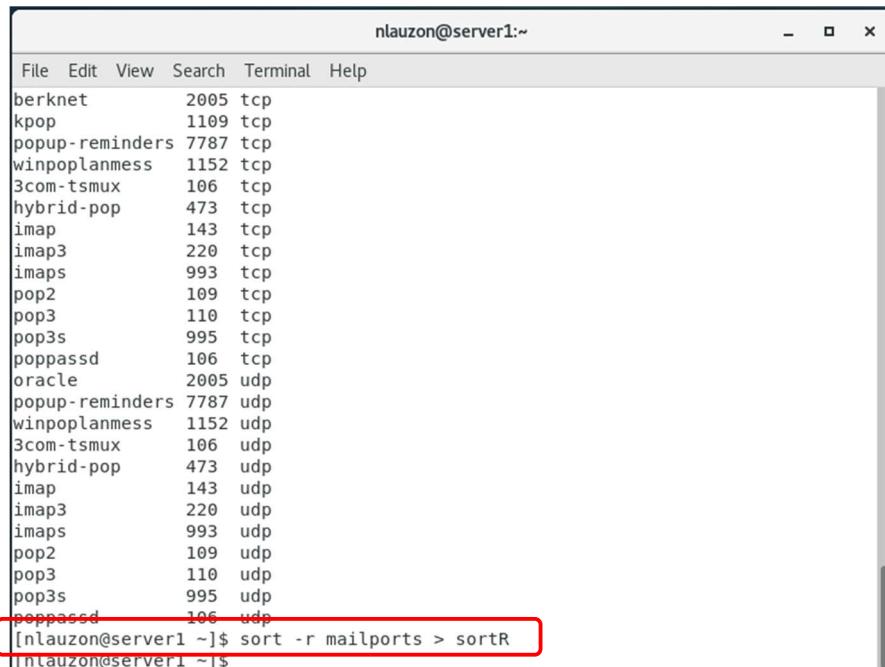
And below are the results in sort3.



```
nlauzon@server1:~$ cat sort3
berknet      2005  tcp
kpop         1109  tcp
popup-reminders 7787  tcp
winpoplanmess 1152  tcp
3com-tsmux    106   tcp
hybrid-pop    473   tcp
imap          143   tcp
imap3         220   tcp
imaps         993   tcp
pop2          109   tcp
pop3          110   tcp
pop3s         995   tcp
poppassd      106   tcp
oracle        2005  udp
popup-reminders 7787  udp
winpoplanmess 1152  udp
3com-tsmux    106   udp
hybrid-pop    473   udp
imap          143   udp
imap3         220   udp
imaps         993   udp
pop2          109   udp
pop3          110   udp
pop3s         995   udp
poppassd      106   udp
[ nlauzon@server1 ~]$
```

27. Sort the file mailports in reverse order and redirect the output to a new file named sortR. Verify the content of the file sortR.

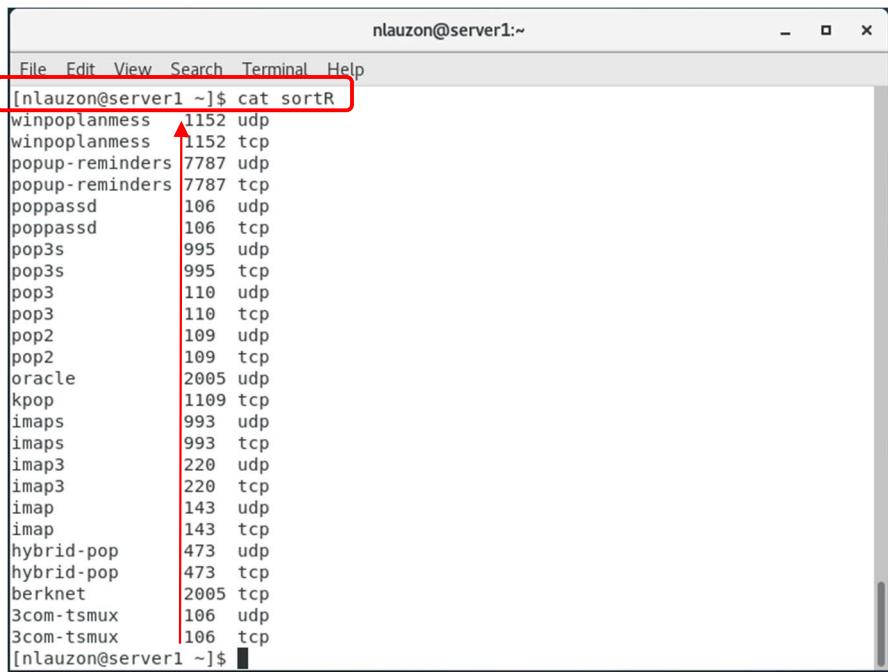
Below is the command:



```
nlauzon@server1:~$ sort -r mailports > sortR
[ nlauzon@server1 ~]$
```

And below are the results in sortR.

Nicolas Lauzon



```
nlauzon@server1:~$ cat sortR
winpoplanmess 1152 udp
winpoplanmess 1152 tcp
popup-reminders 7787 udp
popup-reminders 7787 tcp
poppassd 106 udp
poppassd 106 tcp
pop3s 995 udp
pop3s 995 tcp
pop3 110 udp
pop3 110 tcp
pop2 109 udp
pop2 109 tcp
oracle 2005 udp
kpop 1109 tcp
imaps 993 udp
imaps 993 tcp
imap3 220 udp
imap3 220 tcp
imap 143 udp
imap 143 tcp
hybrid-pop 473 udp
hybrid-pop 473 tcp
berknet 2005 tcp
3com-tsmux 106 udp
3com-tsmux 106 tcp
[nlauzon@server1 ~]$
```