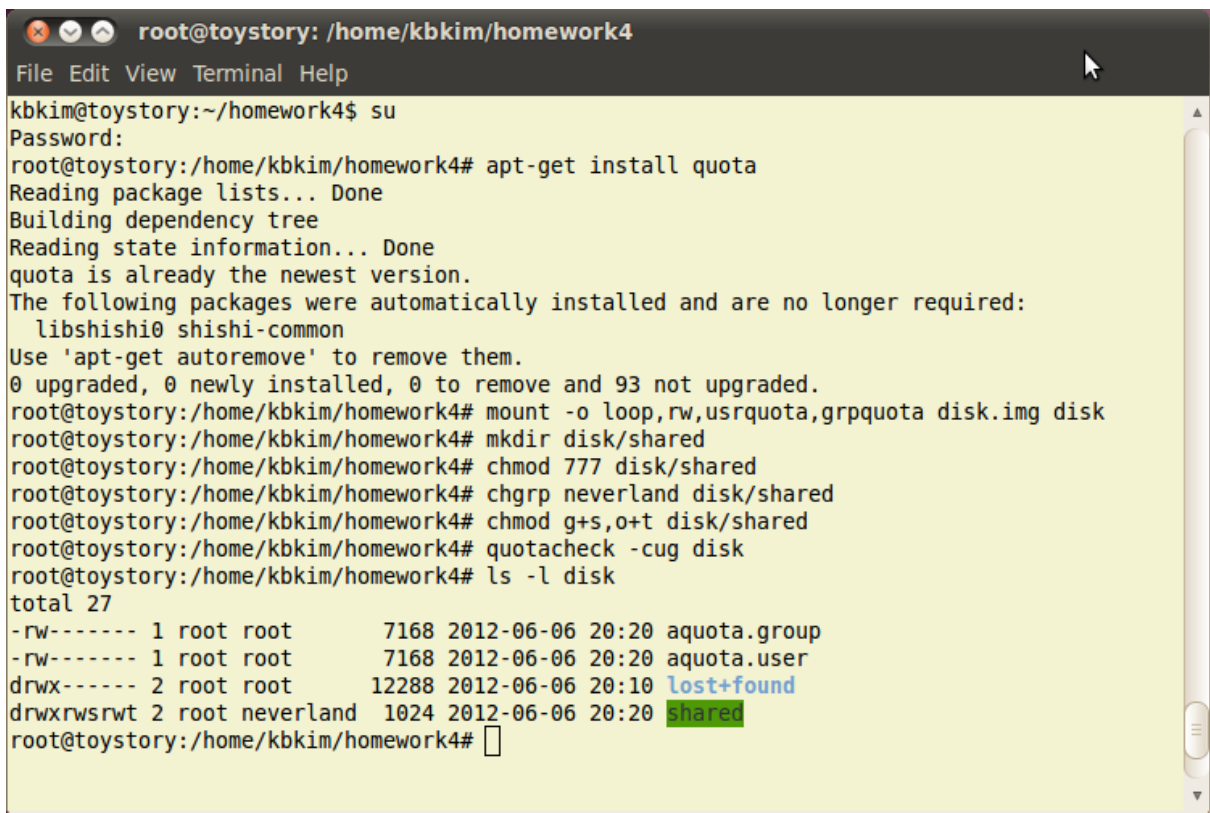# Homework #4 Solution

1. Start a new terminal, then move to the directory where "disk.img"(generated during previous homework) locates, then do "clear", then do "su"(password required), then do "apt-get install quota" (press Y for all questions), then do "mount –o loop,rw,usrquota,grpquota disk.img disk", then do "mkdir disk/shared", then do "chmod 777 disk/shared", then do "chgrp neverland disk/shared", then do "chmod g+s,o+t disk/shared", do "quotacheck –cug disk", then do "ls –l disk". Assumption : There are users named as peterpan and hook. Both users are members of a group named as neverland.

- Take a screenshot 📷

```
😣 ⌄ ⌃   root@toystory: /home/kbkim/homework4
File Edit View Terminal Help
kbkim@toystory:~/homework4$ su
Password:
root@toystory:/home/kbkim/homework4# apt-get install quota
Reading package lists... Done
Building dependency tree
Reading state information... Done
quota is already the newest version.
The following packages were automatically installed and are no longer required:
  libshishi0 shishi-common
Use 'apt-get autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 93 not upgraded.
root@toystory:/home/kbkim/homework4# mount -o loop,rw,usrquota,grpquota disk.img disk
root@toystory:/home/kbkim/homework4# mkdir disk/shared
root@toystory:/home/kbkim/homework4# chmod 777 disk/shared
root@toystory:/home/kbkim/homework4# chgrp neverland disk/shared
root@toystory:/home/kbkim/homework4# chmod g+s,o+t disk/shared
root@toystory:/home/kbkim/homework4# quotacheck -cug disk
root@toystory:/home/kbkim/homework4# ls -l disk
total 27
-rw------- 1 root root        7168 2012-06-06 20:20 aquota.group
-rw------- 1 root root        7168 2012-06-06 20:20 aquota.user
drwx------ 2 root root       12288 2012-06-06 20:10 lost+found
drwxrwsrwt 2 root neverland   1024 2012-06-06 20:20 shared
root@toystory:/home/kbkim/homework4# 
```

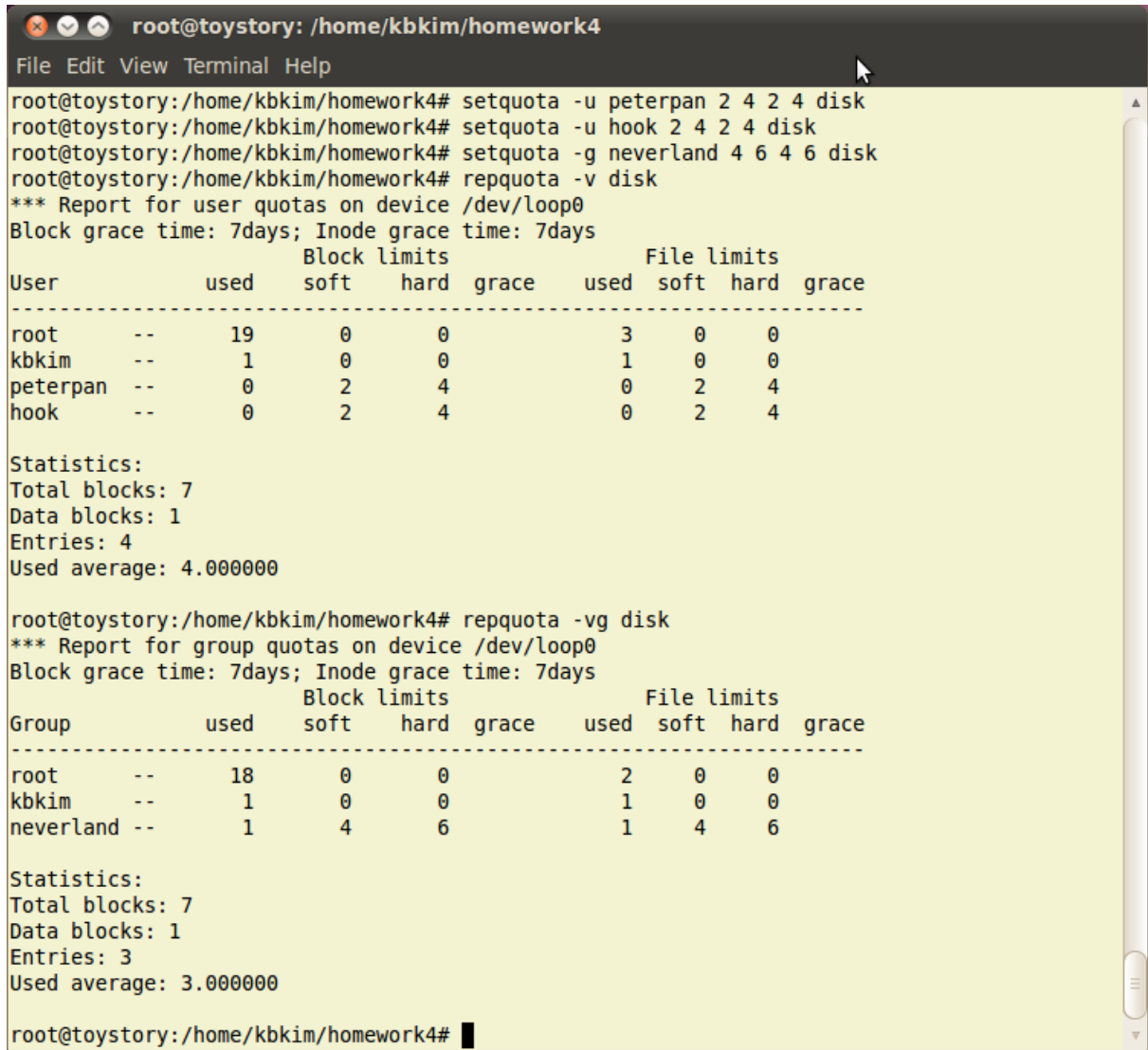- What are the properties of the new directory shared?

➔ **Everyone in the system can access the directory shared. The group of this directory is neverland and the guid bit is set. So, all the files and all the directories which will be created in the shared directory are owned by the group neverland. Also, the sticky bit is set.**

- What is the functionality of "quotacheck"?

➔ **check the current quota status of a filesystem. With the given options, aquota.user and aquota.group file are created at the root directory of the filesystem.**

2. Do "clear", then do "setquota –u peterpan 2 4 2 4 disk", then do "setquota –u hook 2 4 2 4 disk", then do "setquota –g neverland 4 6 4 6 disk", then do "repquota –v disk", then do "repquota –vg disk"

   - Take a screenshots for repquota commands 📷

```
root@toystory: /home/kbkim/homework4
File  Edit  View  Terminal  Help
root@toystory:/home/kbkim/homework4# setquota -u peterpan 2 4 2 4 disk
root@toystory:/home/kbkim/homework4# setquota -u hook 2 4 2 4 disk
root@toystory:/home/kbkim/homework4# setquota -g neverland 4 6 4 6 disk
root@toystory:/home/kbkim/homework4# repquota -v disk
*** Report for user quotas on device /dev/loop0
Block grace time: 7days; Inode grace time: 7days
                        Block limits              File limits
User            used    soft    hard   grace   used  soft  hard  grace
----------------------------------------------------------------------
root      --     19       0       0              3     0     0
kbkim     --      1       0       0              1     0     0
peterpan  --      0       2       4              0     2     4
hook      --      0       2       4              0     2     4

Statistics:
Total blocks: 7
Data blocks: 1
Entries: 4
Used average: 4.000000

root@toystory:/home/kbkim/homework4# repquota -vg disk
*** Report for group quotas on device /dev/loop0
Block grace time: 7days; Inode grace time: 7days
                        Block limits              File limits
Group           used    soft    hard   grace   used  soft  hard  grace
----------------------------------------------------------------------
root      --     18       0       0              2     0     0
kbkim     --      1       0       0              1     0     0
neverland --      1       4       6              1     4     6

Statistics:
Total blocks: 7
Data blocks: 1
Entries: 3
Used average: 3.000000

root@toystory:/home/kbkim/homework4#
```
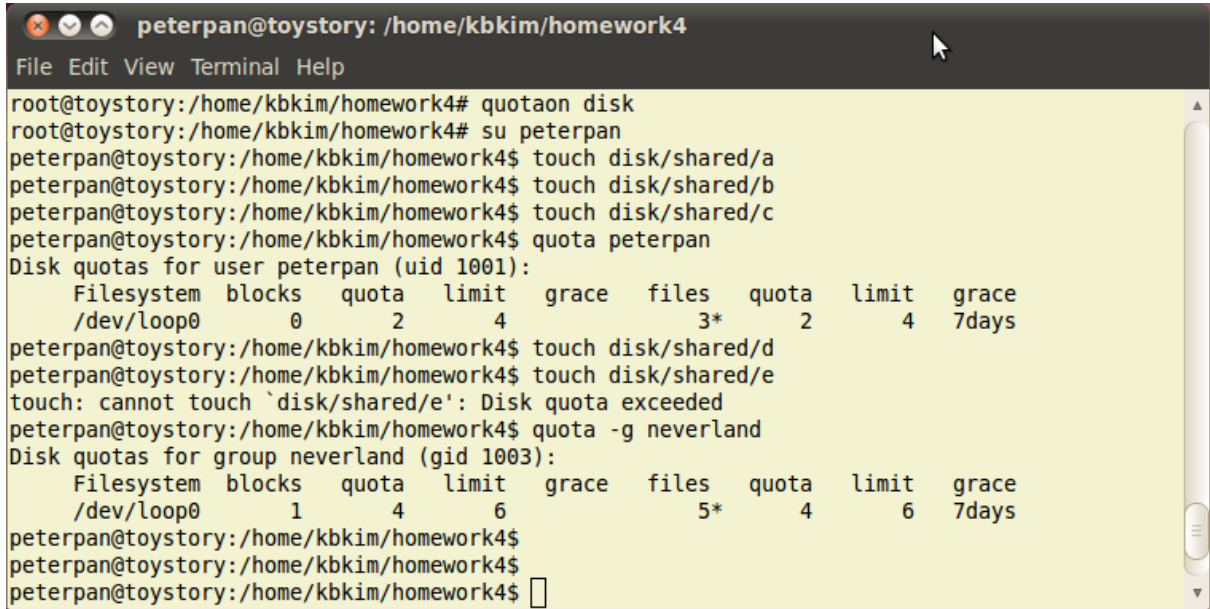
   - What is the functionality of "setquota"? Explain the options "-u" and "-g" and arguments.
      ➔ set the quota of the filesystem for a given user or a given group. "-u" option is for user, -g option is for group.

3. Do "clear", then do "quotaon disk", then do "su peterpan", then do "touch disk/shared/a", then do "touch disk/shared/b", then do "touch disk/shared/c", then do "quota peterpan", then do "touch disk/shared/d", then do "touch disk/shared/e", then do "quota –g neverland", then do "exit"

- Take a screenshot 📷

```
peterpan@toystory: /home/kbkim/homework4
File  Edit  View  Terminal  Help
root@toystory:/home/kbkim/homework4# quotaon disk
root@toystory:/home/kbkim/homework4# su peterpan
peterpan@toystory:/home/kbkim/homework4$ touch disk/shared/a
peterpan@toystory:/home/kbkim/homework4$ touch disk/shared/b
peterpan@toystory:/home/kbkim/homework4$ touch disk/shared/c
peterpan@toystory:/home/kbkim/homework4$ quota peterpan
Disk quotas for user peterpan (uid 1001):
     Filesystem  blocks   quota   limit   grace   files   quota   limit   grace
     /dev/loop0       0       2       4                3*      2       4   7days
peterpan@toystory:/home/kbkim/homework4$ touch disk/shared/d
peterpan@toystory:/home/kbkim/homework4$ touch disk/shared/e
touch: cannot touch `disk/shared/e': Disk quota exceeded
peterpan@toystory:/home/kbkim/homework4$ quota -g neverland
Disk quotas for group neverland (gid 1003):
     Filesystem  blocks   quota   limit   grace   files   quota   limit   grace
     /dev/loop0       1       4       6                5*      4       6   7days
peterpan@toystory:/home/kbkim/homework4$
peterpan@toystory:/home/kbkim/homework4$
peterpan@toystory:/home/kbkim/homework4$ []
```
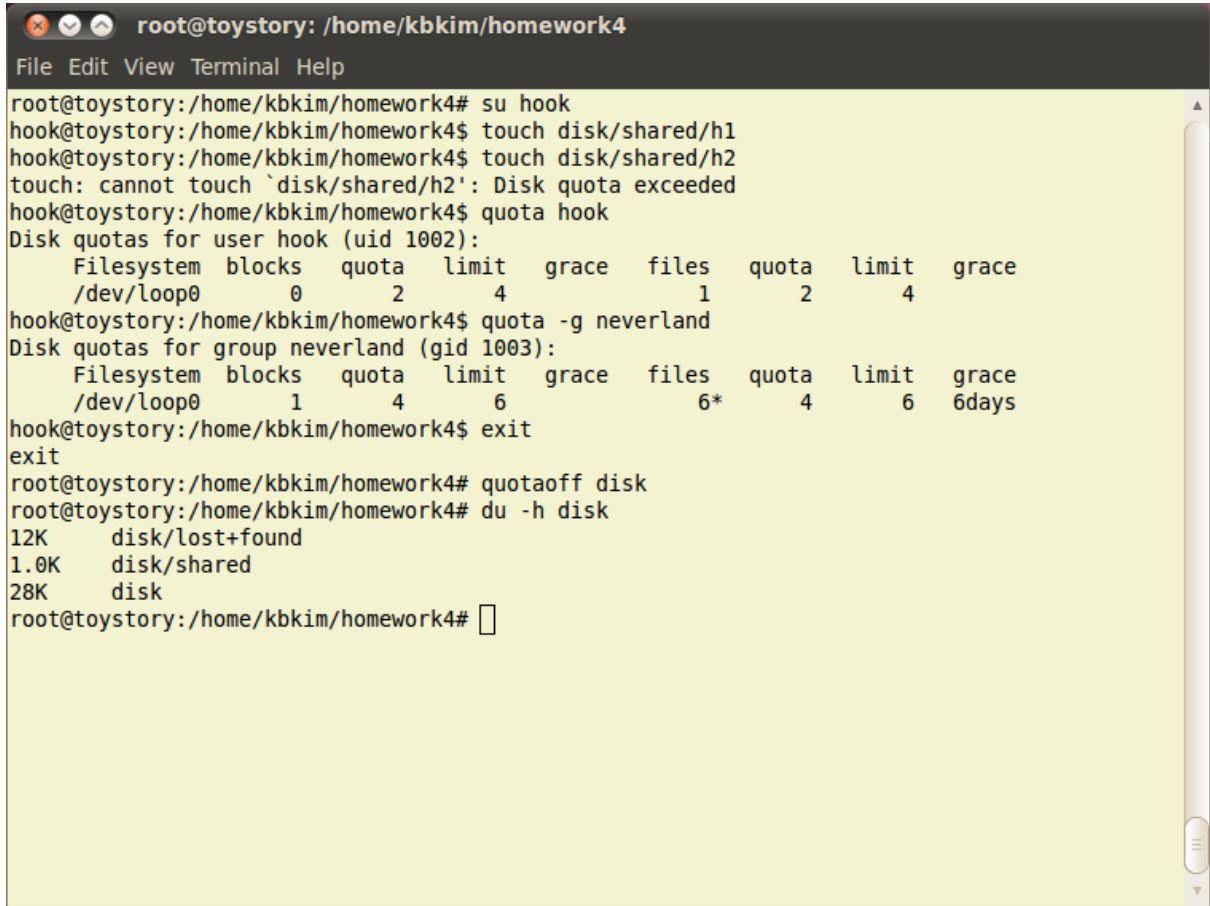
- What is the difference between the soft limit and hard limit?

➔ **User can create more number of files than the soft limit, but uses cannot create more number of files than the hard limit. Once the number of files is bigger than the soft limit, the grace period is set.**

4. Do "clear", then do "su hook", then do "touch disk/shared/h1", then do "touch disk/shared/h2", then do "quota hook", then do "quota –g neverland", then do "exit", then do "quotaoff disk", then do "du –h disk"

   - Take a screenshot

```
⊗ ⊙ ⊚   root@toystory: /home/kbkim/homework4
File Edit View Terminal Help
root@toystory:/home/kbkim/homework4# su hook
hook@toystory:/home/kbkim/homework4$ touch disk/shared/h1
hook@toystory:/home/kbkim/homework4$ touch disk/shared/h2
touch: cannot touch `disk/shared/h2': Disk quota exceeded
hook@toystory:/home/kbkim/homework4$ quota hook
Disk quotas for user hook (uid 1002):
     Filesystem  blocks   quota   limit   grace   files   quota   limit   grace
     /dev/loop0        0       2       4                       1       2       4
hook@toystory:/home/kbkim/homework4$ quota -g neverland
Disk quotas for group neverland (gid 1003):
     Filesystem  blocks   quota   limit   grace   files   quota   limit   grace
     /dev/loop0        1       4       6                      6*       4       6   6days
hook@toystory:/home/kbkim/homework4$ exit
exit
root@toystory:/home/kbkim/homework4# quotaoff disk
root@toystory:/home/kbkim/homework4# du -h disk
12K     disk/lost+found
1.0K    disk/shared
28K     disk
root@toystory:/home/kbkim/homework4# ▯
```

   - What happens during creating h1 and h2? Why?

   ➔ **hook can create the file h1, but cannot create file h2. Even though hook still has enough quota, the group neverland exhausts all the quota and other members of neverland including hook cannot create files.**
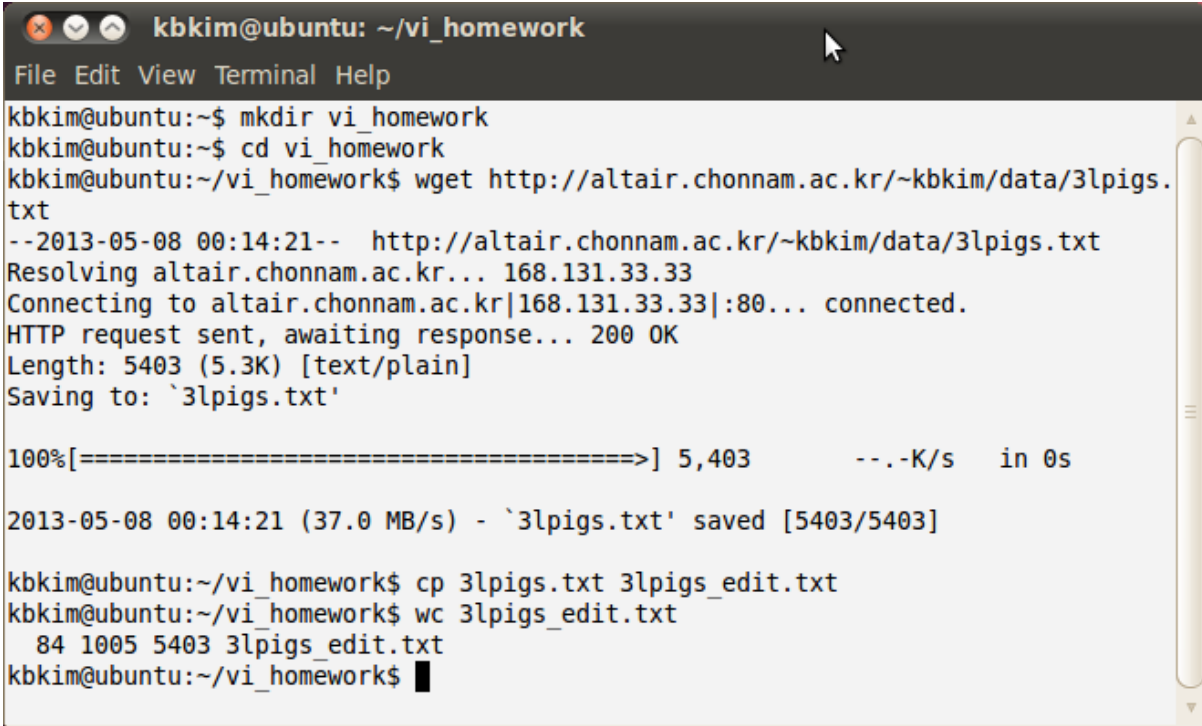
   - What is the command "du" for?

   ➔ **display the usage of the filesystem.**

5. Do "cd ~", then do "mkdir vi_homework", then do "cd vi_homework", then do "wget http://altair.chonnam.ac.kr/~kbkim/data/3lpigs.txt" (your PC needs to connect to Internet before doing this), then do "cp 3lpigs.txt 3lpigs_edit.txt", then do "wc 3lpigs_edit.txt"

- Take a screenshot 📷
- What is the result of the command "wc"? Explain the result.

➔

```
kbkim@ubuntu: ~/vi_homework
File Edit View Terminal Help
kbkim@ubuntu:~$ mkdir vi_homework
kbkim@ubuntu:~$ cd vi_homework
kbkim@ubuntu:~/vi_homework$ wget http://altair.chonnam.ac.kr/~kbkim/data/3lpigs.
txt
--2013-05-08 00:14:21--  http://altair.chonnam.ac.kr/~kbkim/data/3lpigs.txt
Resolving altair.chonnam.ac.kr... 168.131.33.33
Connecting to altair.chonnam.ac.kr|168.131.33.33|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 5403 (5.3K) [text/plain]
Saving to: `3lpigs.txt'

100%[======================================>] 5,403       --.-K/s   in 0s

2013-05-08 00:14:21 (37.0 MB/s) - `3lpigs.txt' saved [5403/5403]

kbkim@ubuntu:~/vi_homework$ cp 3lpigs.txt 3lpigs_edit.txt
kbkim@ubuntu:~/vi_homework$ wc 3lpigs_edit.txt
  84 1005 5403 3lpigs_edit.txt
kbkim@ubuntu:~/vi_homework$ 
```
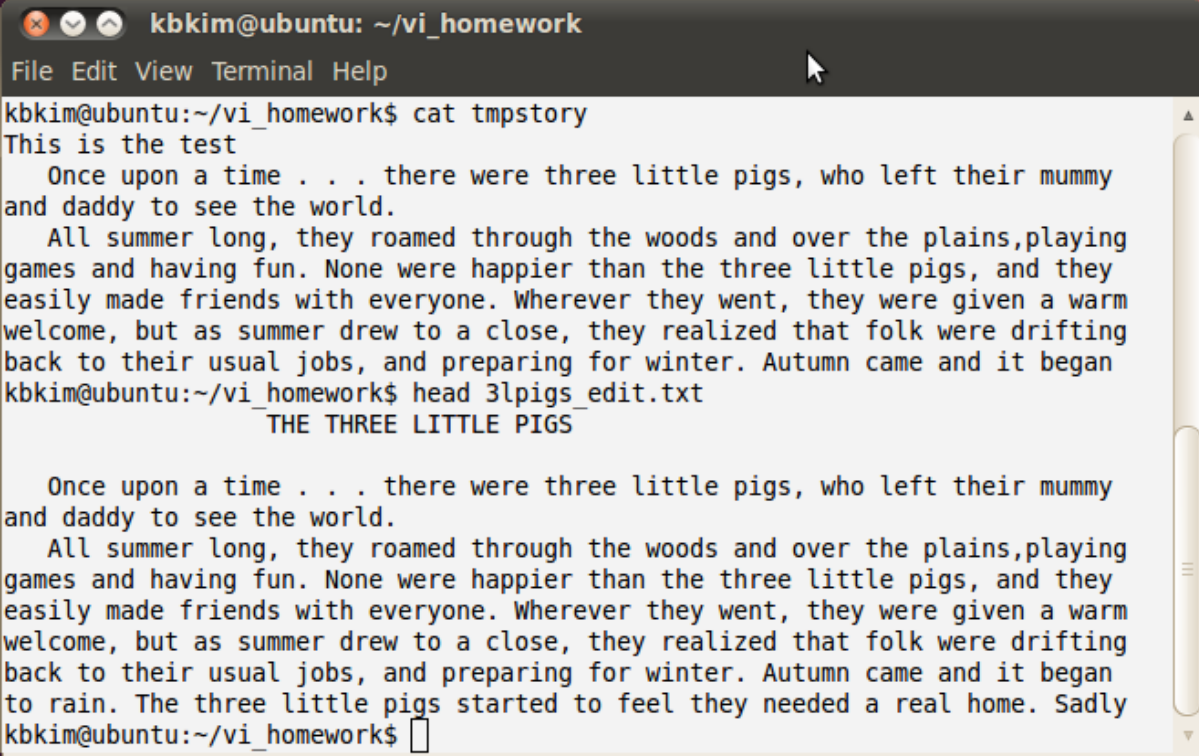
The file "3lpigs_edit.txt" is composed of 84 lines, 1005 words, and 5403 characters.

6. Do "vi 3lpigs_edit.txt", then do ":3" in vi, then press "O", then type "This is the test.", then press ESC key, then do ":3,10w tmpstory" in vi, then do ":q!" in vi, then do "clear", then do "cat tmpstory", then do "head 3lpigs_edit.txt"
   - Take a screen shot 📷
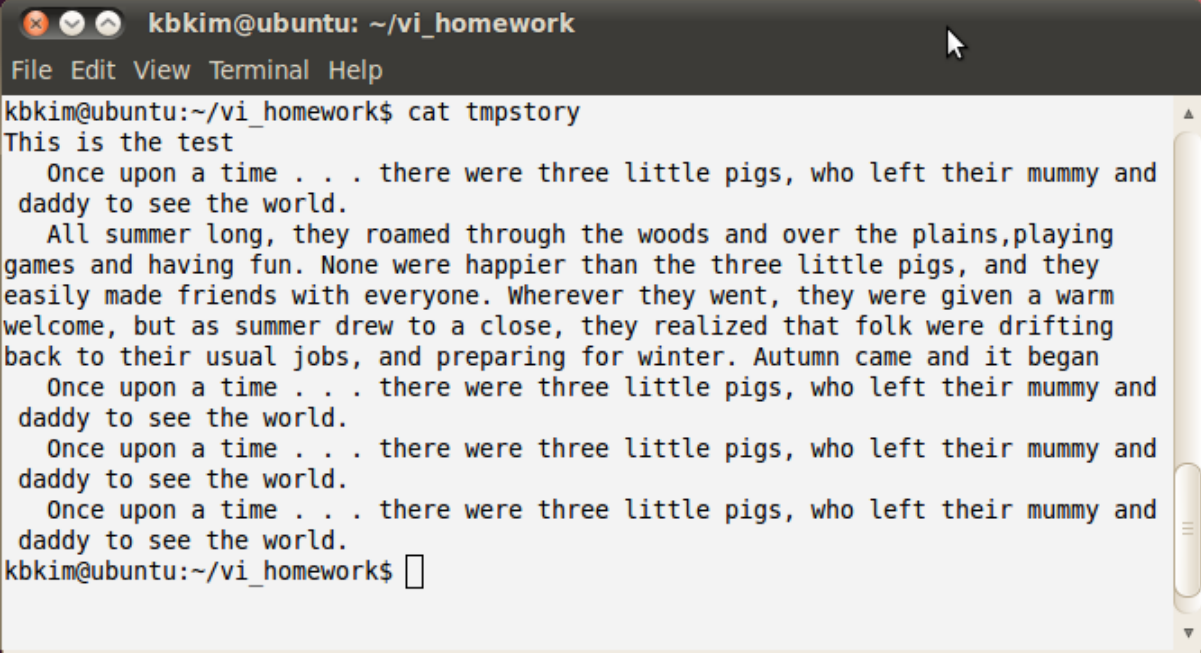   - Which file has the sentence "This is the test."? Why?

→

```
kbkim@ubuntu: ~/vi_homework

File  Edit  View  Terminal  Help

kbkim@ubuntu:~/vi_homework$ cat tmpstory
This is the test
    Once upon a time . . . there were three little pigs, who left their mummy
and daddy to see the world.
    All summer long, they roamed through the woods and over the plains,playing
games and having fun. None were happier than the three little pigs, and they
easily made friends with everyone. Wherever they went, they were given a warm
welcome, but as summer drew to a close, they realized that folk were drifting
back to their usual jobs, and preparing for winter. Autumn came and it began
kbkim@ubuntu:~/vi_homework$ head 3lpigs_edit.txt
                  THE THREE LITTLE PIGS

    Once upon a time . . . there were three little pigs, who left their mummy
and daddy to see the world.
    All summer long, they roamed through the woods and over the plains,playing
games and having fun. None were happier than the three little pigs, and they
easily made friends with everyone. Wherever they went, they were given a warm
welcome, but as summer drew to a close, they realized that folk were drifting
back to their usual jobs, and preparing for winter. Autumn came and it began
to rain. The three little pigs started to feel they needed a real home. Sadly
kbkim@ubuntu:~/vi_homework$
```

The file "tmpstory" has the sentence "This is the test". During editing with VI, "tmpstory" file is created and saved with 3~10 lines of "3lpigs_edit.txt" file including the inserted sentence "This is the test.". But, the change of "3lpigs_edit.txt" is not saved since VI is terminated with ":q!" command.

7. Do "vi tmpstory", then press "j" one time, then press "J" (capital letter of j), then press "yy" (press "y" two times), then press "G" (capital letter of g), then press "4p" (press 4 then press p), then press "dd" (press "d" two times), then do ":wq" in vi, then do "clear", then "cat tmpstory"
- Take a screen shot 📷
- What is "yy", "p", "dd" for in vi?

➔

```
😕 😌 😊   kbkim@ubuntu: ~/vi_homework

File  Edit  View  Terminal  Help
kbkim@ubuntu:~/vi_homework$ cat tmpstory
This is the test
  Once upon a time . . . there were three little pigs, who left their mummy and
 daddy to see the world.
  All summer long, they roamed through the woods and over the plains,playing
games and having fun. None were happier than the three little pigs, and they
easily made friends with everyone. Wherever they went, they were given a warm
welcome, but as summer drew to a close, they realized that folk were drifting
back to their usual jobs, and preparing for winter. Autumn came and it began
  Once upon a time . . . there were three little pigs, who left their mummy and
 daddy to see the world.
  Once upon a time . . . there were three little pigs, who left their mummy and
 daddy to see the world.
  Once upon a time . . . there were three little pigs, who left their mummy and
 daddy to see the world.
kbkim@ubuntu:~/vi_homework$ ▯
```
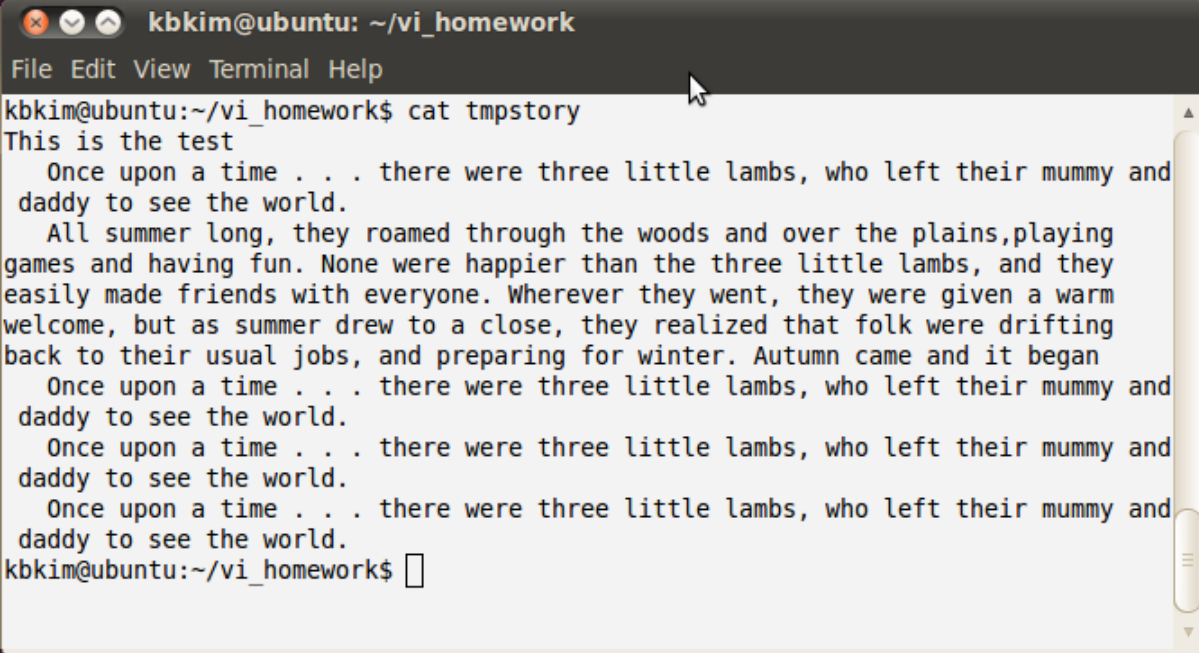
"yy" ➔ Copy a line into a clipboard.

"p" ➔ Paste a copied contents at the current position of the cursor

"dd" ➔ Remove one line and copy the line into a clipboard.

8. Do "vi tmpstory", then do "/pigs" in vi, then press "n" for five times, then do ":1,$s/pigs/lambs/g"
in vi, then press "ZZ", then do "clear", then do "cat tmpstory"
   - Take a screen shot 📷
   - What is the command ":1,$s/pigs/lambs/g" for?

➔

```
😣 😊 😊   kbkim@ubuntu: ~/vi_homework

File Edit View Terminal Help
kbkim@ubuntu:~/vi_homework$ cat tmpstory
This is the test
  Once upon a time . . . there were three little lambs, who left their mummy and
 daddy to see the world.
  All summer long, they roamed through the woods and over the plains,playing
games and having fun. None were happier than the three little lambs, and they
easily made friends with everyone. Wherever they went, they were given a warm
welcome, but as summer drew to a close, they realized that folk were drifting
back to their usual jobs, and preparing for winter. Autumn came and it began
  Once upon a time . . . there were three little lambs, who left their mummy and
 daddy to see the world.
  Once upon a time . . . there were three little lambs, who left their mummy and
 daddy to see the world.
  Once upon a time . . . there were three little lambs, who left their mummy and
 daddy to see the world.
kbkim@ubuntu:~/vi_homework$ ▯
```

":1,$s/pigs/lambs/g" is the command to globally replace a pattern "pigs" into a new pattern "lambs" from 1 to end of the file.