

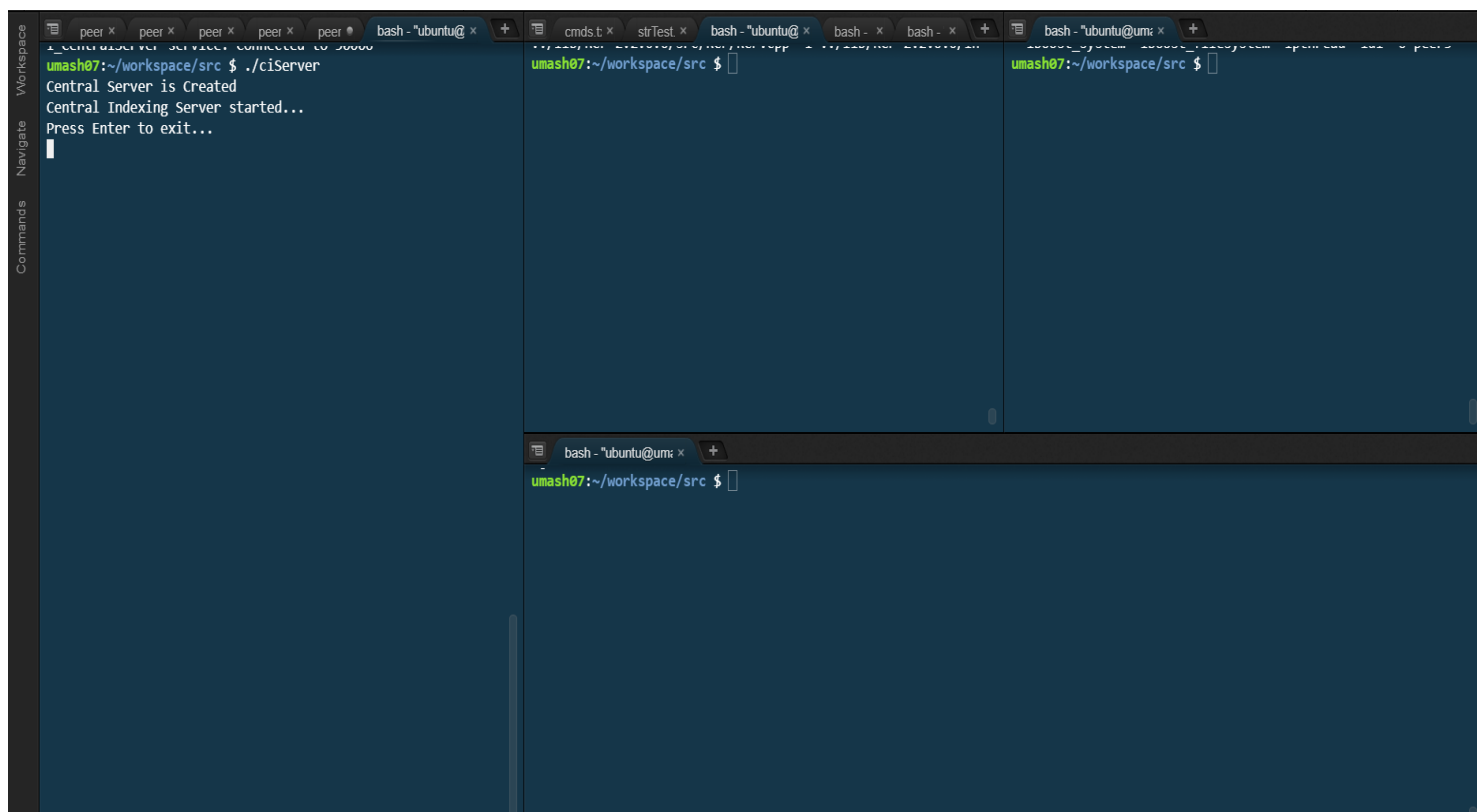
# CS 550 Programming Assignment – 1

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## Output Snapshots for Peer to Peer Network

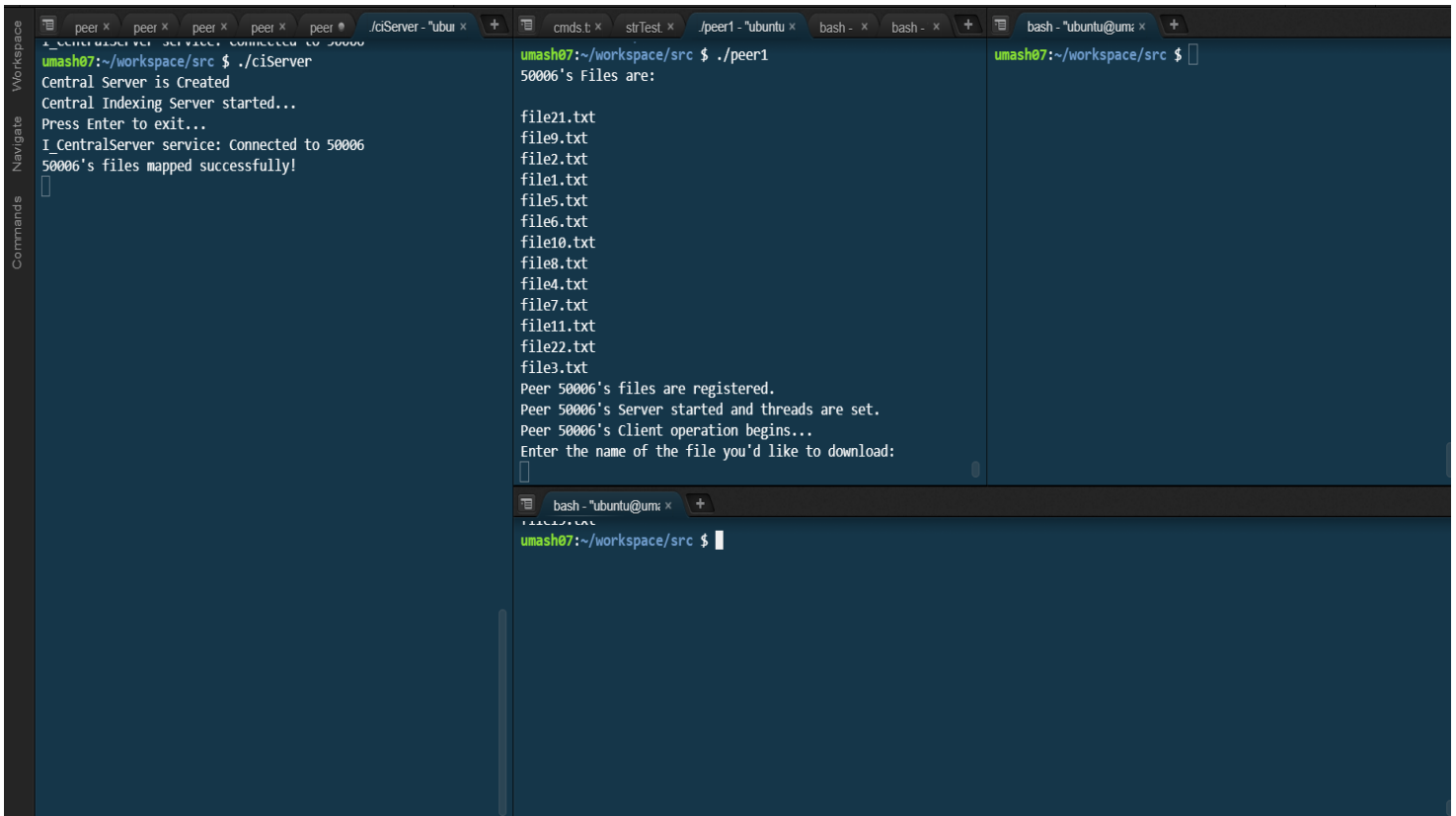
Following are the screenshots taken during the p2p system run:

### 1) Central Indexing Server begins:



- The left pane shows the beginning of Central Indexing Server just when it is executed with its binary (`ciServer`). The rest of the tabs show the peers, with their binaries ready to execute.

## 2) Peer 1 registers with the CI server:



The screenshot shows a terminal window with multiple tabs. The active tab is titled 'peer1 - ubuntu'. The terminal output is as follows:

```
umash07:~/workspace/src $ ./ciServer
Central Server is Created
Central Indexing Server started...
Press Enter to exit...
I CentralServer service: Connected to 50006
50006's files mapped successfully!

```

The terminal then displays a list of files registered to Peer 50006:

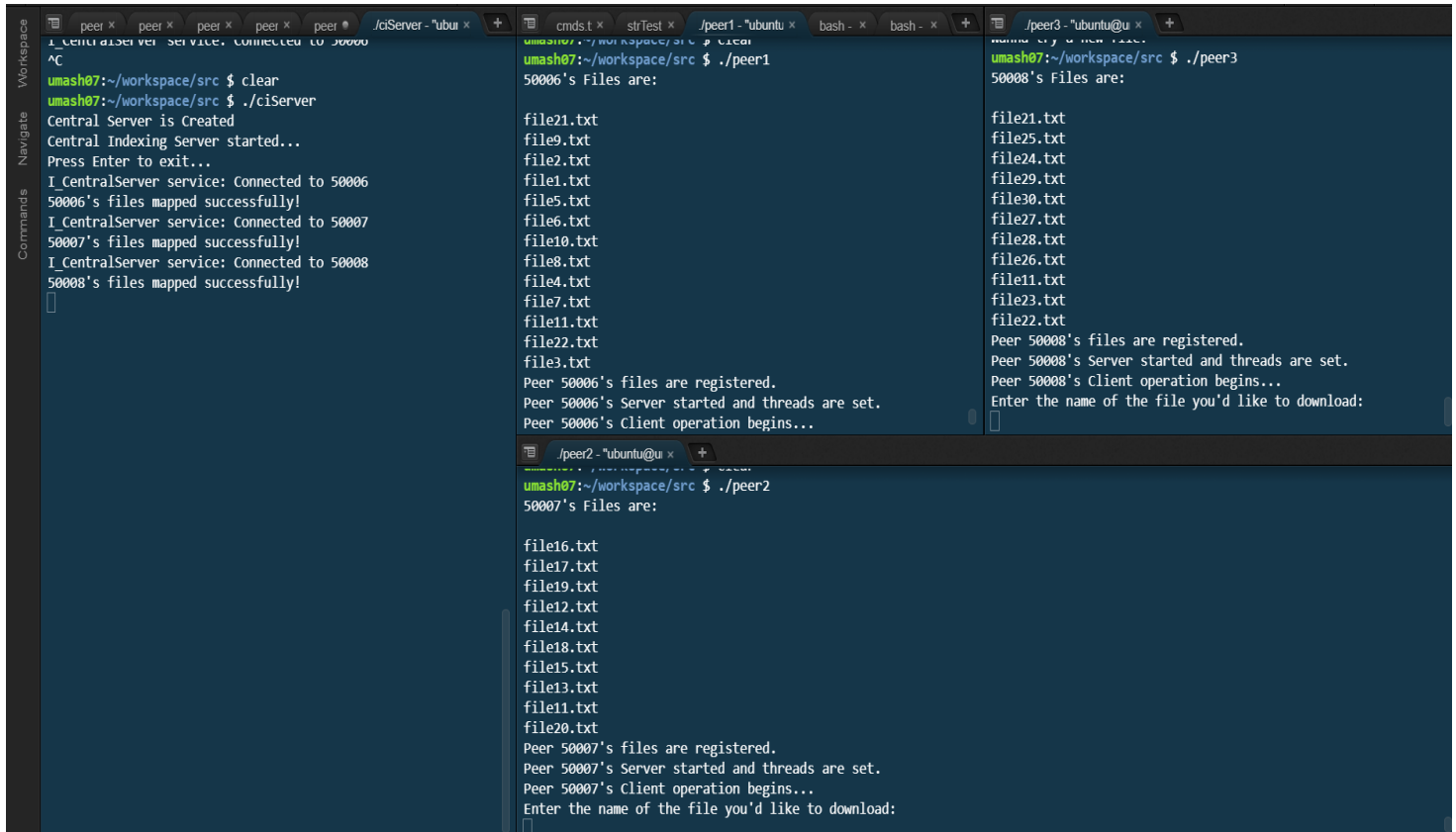
```
50006's Files are:
file21.txt
file9.txt
file2.txt
file1.txt
file5.txt
file6.txt
file10.txt
file8.txt
file4.txt
file7.txt
file11.txt
file22.txt
file3.txt
Peer 50006's files are registered.
Peer 50006's Server started and threads are set.
Peer 50006's Client operation begins...
Enter the name of the file you'd like to download:

```

The terminal is currently waiting for user input.

- Now the peer1 binary gets executed and connects with the CI server.
- The CI server acknowledges the connection with the peer1's endpoint (50006) and informs that file indexing is successful.
- Peer (client) prompts the user to input any filename to search for.
- Other two peers are yet to run.

### 3) All peers connect with the CI server:



```
peer x peer x peer x peer x peer x /ciServer - "ubu x +
I_CentralServer service: Connected to 50006
AC
umash07:~/workspace/src $ clear
umash07:~/workspace/src $ ./ciServer
Central Server is Created
Central Indexing Server started...
Press Enter to exit...
I_CentralServer service: Connected to 50006
50006's files mapped successfully!
I_CentralServer service: Connected to 50007
50007's files mapped successfully!
I_CentralServer service: Connected to 50008
50008's files mapped successfully!
[]

cmdst x strTest x /peer1 - "ubuntu x bash - x bash - x +
umash07:~/workspace/src $ ./peer1
50006's Files are:
file21.txt
file9.txt
file2.txt
file1.txt
file5.txt
file6.txt
file10.txt
file8.txt
file4.txt
file7.txt
file11.txt
file22.txt
file3.txt
Peer 50006's files are registered.
Peer 50006's Server started and threads are set.
Peer 50006's Client operation begins...

/peer2 - "ubuntu@u x +
umash07:~/workspace/src $ ./peer2
50007's Files are:
file16.txt
file17.txt
file19.txt
file12.txt
file14.txt
file18.txt
file15.txt
file13.txt
file11.txt
file20.txt
Peer 50007's files are registered.
Peer 50007's Server started and threads are set.
Peer 50007's Client operation begins...
Enter the name of the file you'd like to download:

/peer3 - "ubuntu@u x +
umash07:~/workspace/src $ ./peer3
50008's Files are:
file21.txt
file25.txt
file24.txt
file29.txt
file30.txt
file27.txt
file28.txt
file26.txt
file11.txt
file23.txt
file22.txt
Peer 50008's files are registered.
Peer 50008's Server started and threads are set.
Peer 50008's Client operation begins...
Enter the name of the file you'd like to download:
[]
```

- All the three peers are connected to the server by executing their respective binaries and each prompting the user to enter the filename to look up and download it.
- Endpoints (Peer1 – 50006, Peer2 – 50007, Peer3 – 50008) are connected with the CI server successfully.
- The peers' files are indexed at the CI server successfully.

4) User at Peer1 window enters a filename (file1.txt) though it already has:

```
cmd5.t x  strTest x  /peer1 - "ubuntu x  bash - x  bash - x  +
file4.txt
file7.txt
file11.txt
file22.txt
file3.txt
Peer 50006's files are registered.
Peer 50006's Server started and threads are set.
Peer 50006's Client operation begins...
Enter the name of the file you'd like to download:
^C
umash07:~/workspace/src $ clear
umash07:~/workspace/src $ clear
umash07:~/workspace/src $ ./peer1
50006's Files are:

file21.txt
file9.txt
file2.txt
file1.txt
file5.txt
file6.txt
file10.txt
file8.txt
file4.txt
file7.txt
file11.txt
file22.txt
file3.txt
Peer 50006's files are registered.
Peer 50006's Server started and threads are set.
Peer 50006's Client operation begins...
Enter the name of the file you'd like to download:
file1.txt
file1.txt already exists for client 50006! Try another file..
#-----
Wanna try a new file?
* Enter 1 to continue, Or else
* Enter 0 to exit.
```

- The file1.txt is already present at 50006 (Peer 1) endpoint. So, it informs the user that it already exists and prompts whether s/he would like to try some other files.

## 5) Peer2 downloads a file (file28.txt)

```
peer x peer x peer x peer x peer x .ciServer - "ubun... + .peer1 - "ubuntu... .peer2 - "ubuntu... .peer3 - "ubuntu...
I_CentralServer service: Connected to 50006
^C
umash07:~/workspace/src $ clear
umash07:~/workspace/src $ ./ciServer
Central Server is Created
Central Indexing Server started...
Press Enter to exit...
I_CentralServer service: Connected to 50006
50006's files mapped successfully!
I_CentralServer service: Connected to 50007
50007's files mapped successfully!
I_CentralServer service: Connected to 50008
50008's files mapped successfully!
I_CentralServer service: Connected to 50007
50007's files mapped successfully!
[]

umash07:~/workspace/src $ clear
umash07:~/workspace/src $ clear
umash07:~/workspace/src $ clear
umash07:~/workspace/src $ ./peer2
50007's Files are:
file16.txt
file17.txt
file19.txt
file12.txt
file14.txt
file18.txt
file15.txt
file13.txt
file11.txt
file20.txt
Peer 50007's files are registered.
Peer 50007's Server started and threads are set.
Peer 50007's Client operation begins...
Enter the name of the file you'd like to download:
file 37.txt
No seed sources for the given file! Try another file..
#-----
Wanna try a new file?
* Enter 1 to continue, Or else
* Enter 0 to exit.
1
Enter the name of the file you'd like to download:
file28.txt
The seed server(s) containing file28.txt is/are:
50008
$$ Client 50007 has got file28.txt from Peer 50008 $$
Download Success!
Peer 50007's files are registered.
#-----
Wanna try a new file?
* Enter 1 to continue, Or else
* Enter 0 to exit.
```

- Peer2 (50007) has downloaded a file (file28.txt) which is available at Peer3 (50008).
- After the successful download, it re-registers its files with the CI client.

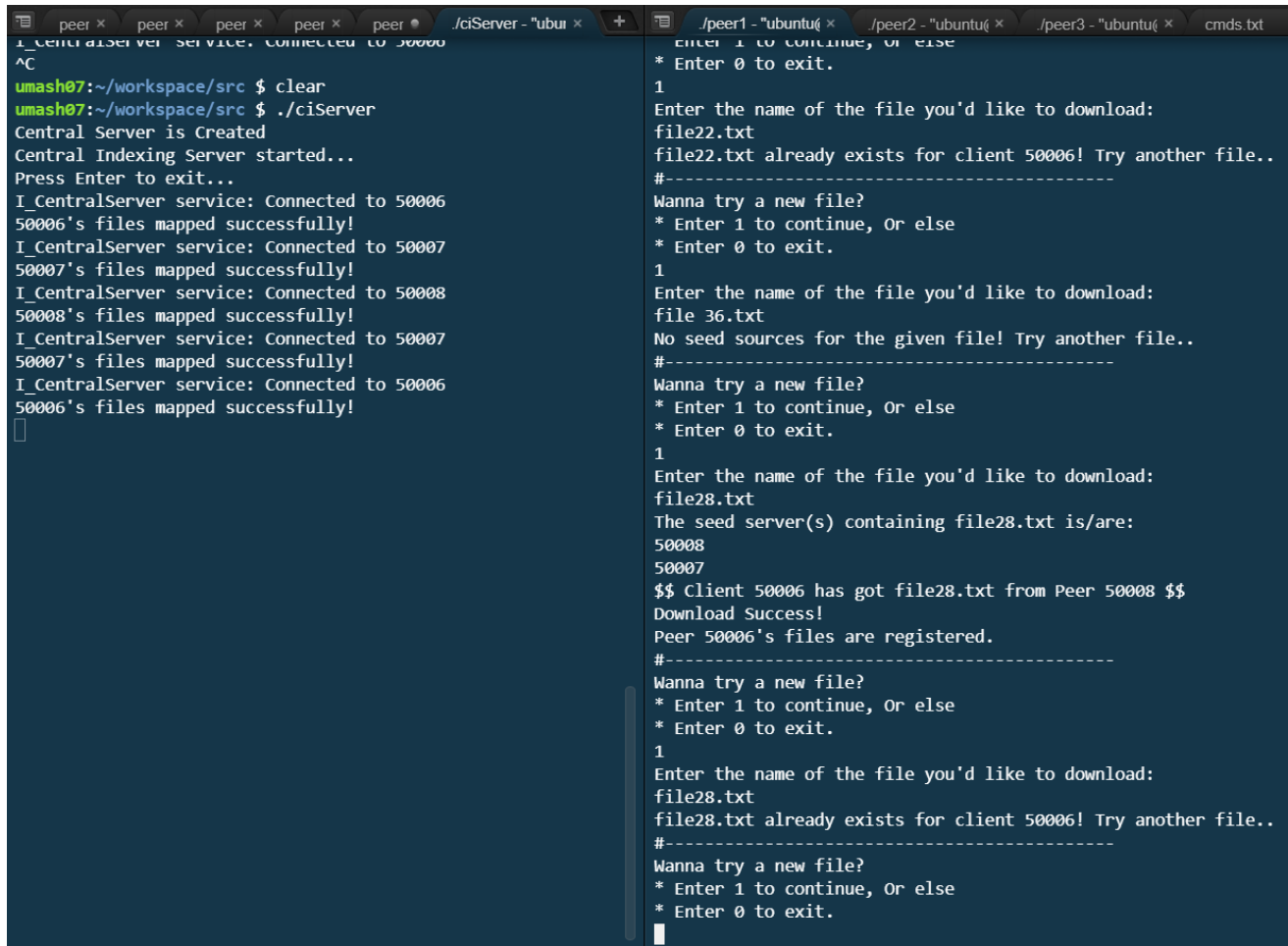
6) Peer1 downloads a file (file28.txt) that is now available at two peers:

```
peer x peer x peer x peer x peer x /ciServer - "ubun x + /peer1 - "ubuntu x /peer2 - "ubuntu x /peer3 - "ubuntu x
I_CentralServer service: Connected to 50006
^C
umash07:~/workspace/src $ clear
umash07:~/workspace/src $ ./ciServer
Central Server is Created
Central Indexing Server started...
Press Enter to exit...
I_CentralServer service: Connected to 50006
50006's files mapped successfully!
I_CentralServer service: Connected to 50007
50007's files mapped successfully!
I_CentralServer service: Connected to 50008
50008's files mapped successfully!
I_CentralServer service: Connected to 50007
50007's files mapped successfully!
I_CentralServer service: Connected to 50006
50006's files mapped successfully!
█

Peer 50006's files are registered.
Peer 50006's Server started and threads are set.
Peer 50006's Client operation begins...
Enter the name of the file you'd like to download:
file1.txt
file1.txt already exists for client 50006! Try another
#-----
Wanna try a new file?
* Enter 1 to continue, Or else
* Enter 0 to exit.
1
Enter the name of the file you'd like to download:
file22.txt
file22.txt already exists for client 50006! Try another
#-----
Wanna try a new file?
* Enter 1 to continue, Or else
* Enter 0 to exit.
1
Enter the name of the file you'd like to download:
file 36.txt
No seed sources for the given file! Try another file..
#-----
Wanna try a new file?
* Enter 1 to continue, Or else
* Enter 0 to exit.
1
Enter the name of the file you'd like to download:
file28.txt
The seed server(s) containing file28.txt is/are:
50008
50007
$$ Client 50006 has got file28.txt from Peer 50008 $$
Download Success!
Peer 50006's files are registered.
#-----
Wanna try a new file?
* Enter 1 to continue, Or else
* Enter 0 to exit.
█
```

- For the file file28.txt, Peer1 (50006)'s lookup finds the file is at Peer3 (50008) and Peer3 (50007).
- Then the file gets downloaded from the Peer3 (50008) successfully.
- After that, Peer1 re-registers its files with the CI server, to inform it about the new addition.

## 7) Peer1 tries to download a file for the second time:



```
peer x peer x peer x peer x peer x /ciServer - "ubun... + /peer1 - "ubuntu... /peer2 - "ubuntu... /peer3 - "ubuntu... cmds.txt
I_CentralServer service: Connected to 50006
^C
umash07:~/workspace/src $ clear
umash07:~/workspace/src $ ./ciServer
Central Server is Created
Central Indexing Server started...
Press Enter to exit...
I_CentralServer service: Connected to 50006
50006's files mapped successfully!
I_CentralServer service: Connected to 50007
50007's files mapped successfully!
I_CentralServer service: Connected to 50008
50008's files mapped successfully!
I_CentralServer service: Connected to 50007
50007's files mapped successfully!
I_CentralServer service: Connected to 50006
50006's files mapped successfully!
[
Enter 1 to continue, Or else
* Enter 0 to exit.
1
Enter the name of the file you'd like to download:
file22.txt
file22.txt already exists for client 50006! Try another file..
#-----
Wanna try a new file?
* Enter 1 to continue, Or else
* Enter 0 to exit.
1
Enter the name of the file you'd like to download:
file36.txt
No seed sources for the given file! Try another file..
#-----
Wanna try a new file?
* Enter 1 to continue, Or else
* Enter 0 to exit.
1
Enter the name of the file you'd like to download:
file28.txt
The seed server(s) containing file28.txt is/are:
50008
50007
$$ Client 50006 has got file28.txt from Peer 50008 $$
Download Success!
Peer 50006's files are registered.
#-----
Wanna try a new file?
* Enter 1 to continue, Or else
* Enter 0 to exit.
1
Enter the name of the file you'd like to download:
file28.txt
file28.txt already exists for client 50006! Try another file..
#-----
Wanna try a new file?
* Enter 1 to continue, Or else
* Enter 0 to exit.
```

- Peer1 has downloaded file28.txt just now. So, when the user asks to download it again, it now recognizes the new entry and informs the user of its availability.

8) Peer2 informs there are no sources for the given file name:

```
umash07:~/workspace/src $ ./peer2
50007's Files are:

file16.txt
file17.txt
file19.txt
file12.txt
file14.txt
file18.txt
file15.txt
file13.txt
file11.txt
file20.txt
Peer 50007's files are registered.
Peer 50007's Server started and threads are set.
Peer 50007's Client operation begins...
Enter the name of the file you'd like to download:
file 37.txt
No seed sources for the given file! Try another file..
#-----
Wanna try a new file?
* Enter 1 to continue, Or else
* Enter 0 to exit.
```

- When the user at Peer2 (50007)'s prompt enters file 37.txt it looks up with the CI server and as expected finds no seeds for downloading it.