CS550(PA#3)-Maintaining File Consistency in Your hierarchical Gnutella-Style P2P System

Manual

The Peer to Peer File Sharing System is developed using Java RMI. So to run this system, Java needs to installed in the machine. Once Java is installed and JAVA_HOME is set with path updated, the following steps need to followed to run the project.
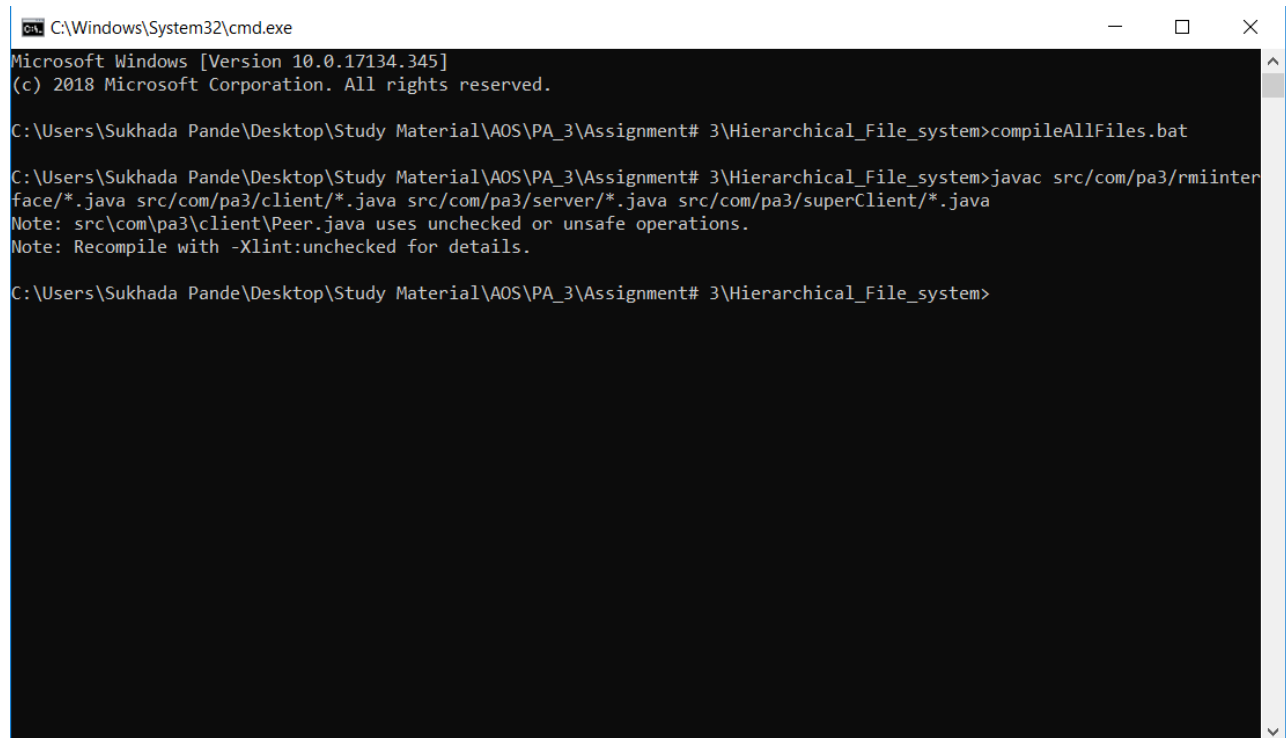
The entire project is compressed and can be downloaded in zip format.

The source code and batch files are placed in "Hierarchical_File_system" Folder. Download the whole zip file and place it in the desired location.

To run the system,

Step – 1: Open command prompt and navigate to Hierarchical_File_system folder.

Step – 2: Now run compileAllFiles.bat . The screenshot below shows how to run the batch file and results after running. This batch file compiles all the Java source code.
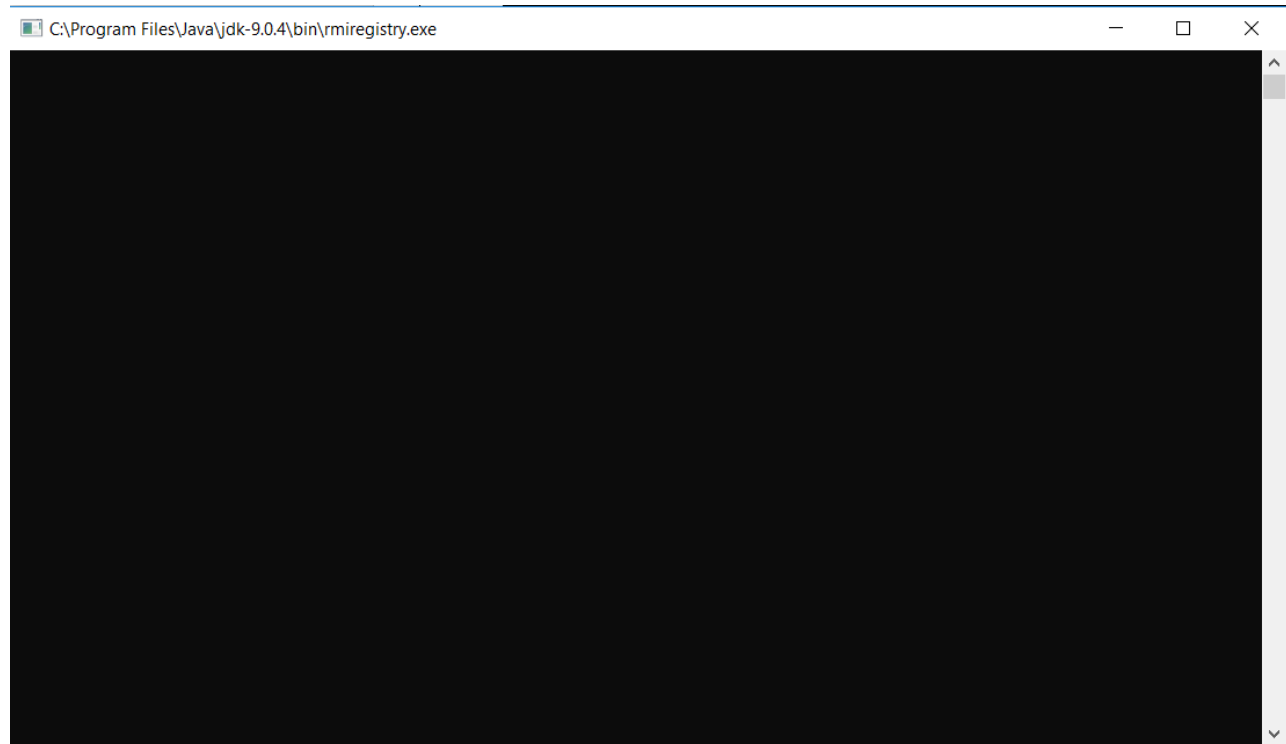

Step- 3: Open another command prompt , run startRegistry.bat to start the rmiregistry. An blank window pops up starting the rmi registry.

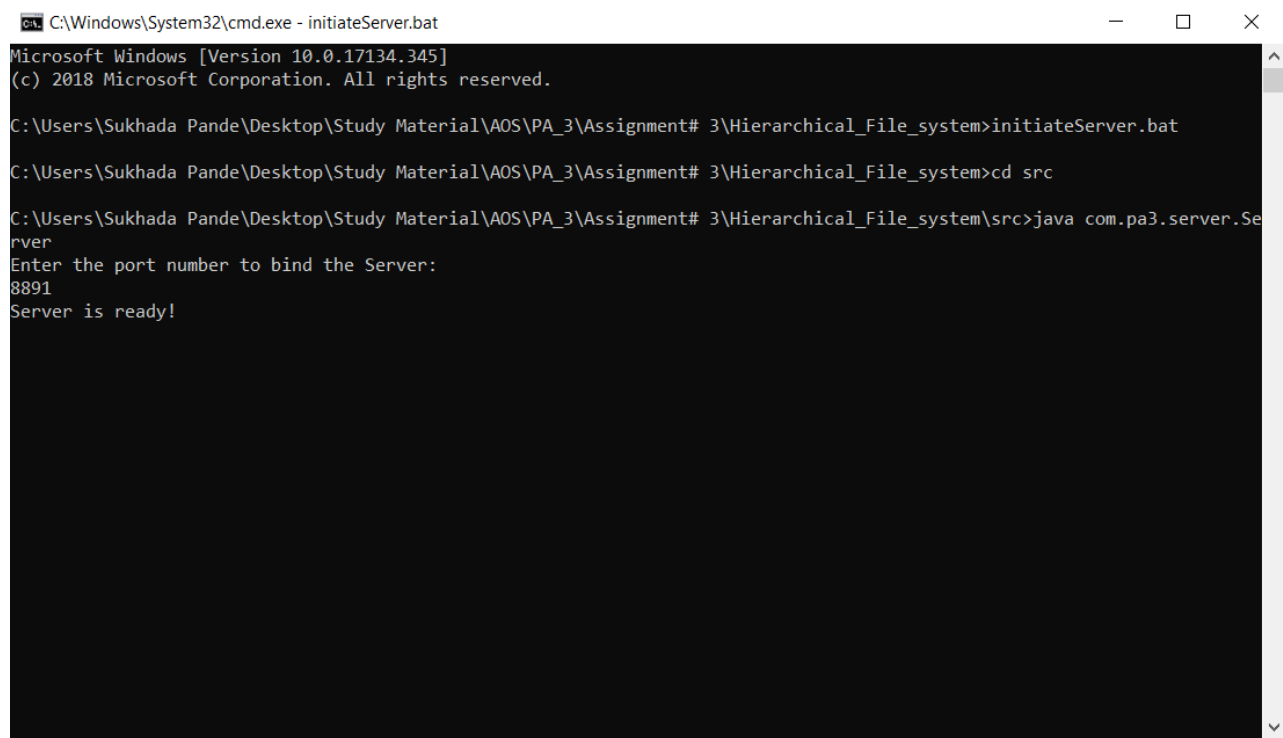C:\Program Files\Java\jdk-9.0.4\bin\rmiregistry.exe

Step – 4 :Open another command prompt and run the initiateServer.bat. This batch file starts the server as shown below. On the server command prompt it will ask you the port number you want your server to bind to , here is the screenshot for the same:

C:\Windows\System32\cmd.exe - initiateServer.bat

```
Microsoft Windows [Version 10.0.17134.345]
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C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\Assignment# 3\Hierarchical_File_system>initiateServer.bat

C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\Assignment# 3\Hierarchical_File_system>cd src

C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\Assignment# 3\Hierarchical_File_system\src>java com.pa3.server.Se
rver
Enter the port number to bind the Server:
```
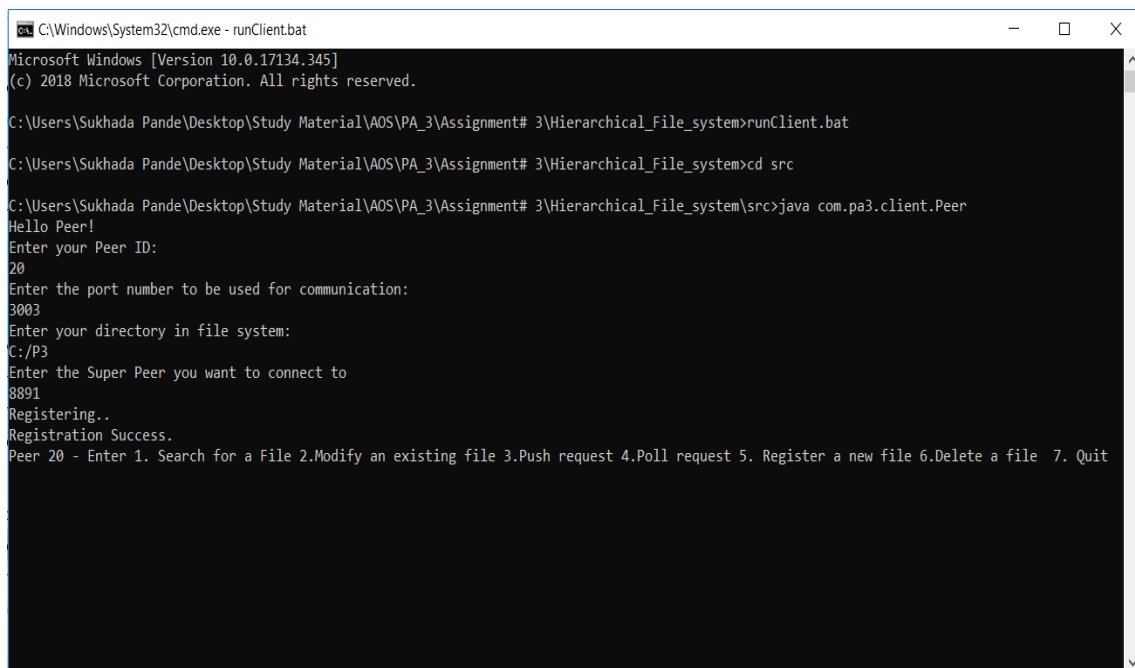
Step - 4: Enter the port number for which server needs to be bind and press Enter.
Make sure you use the same port numbers as configured in the config.properties file.

Step -5: Now it should show the display saying "Server is Ready!"
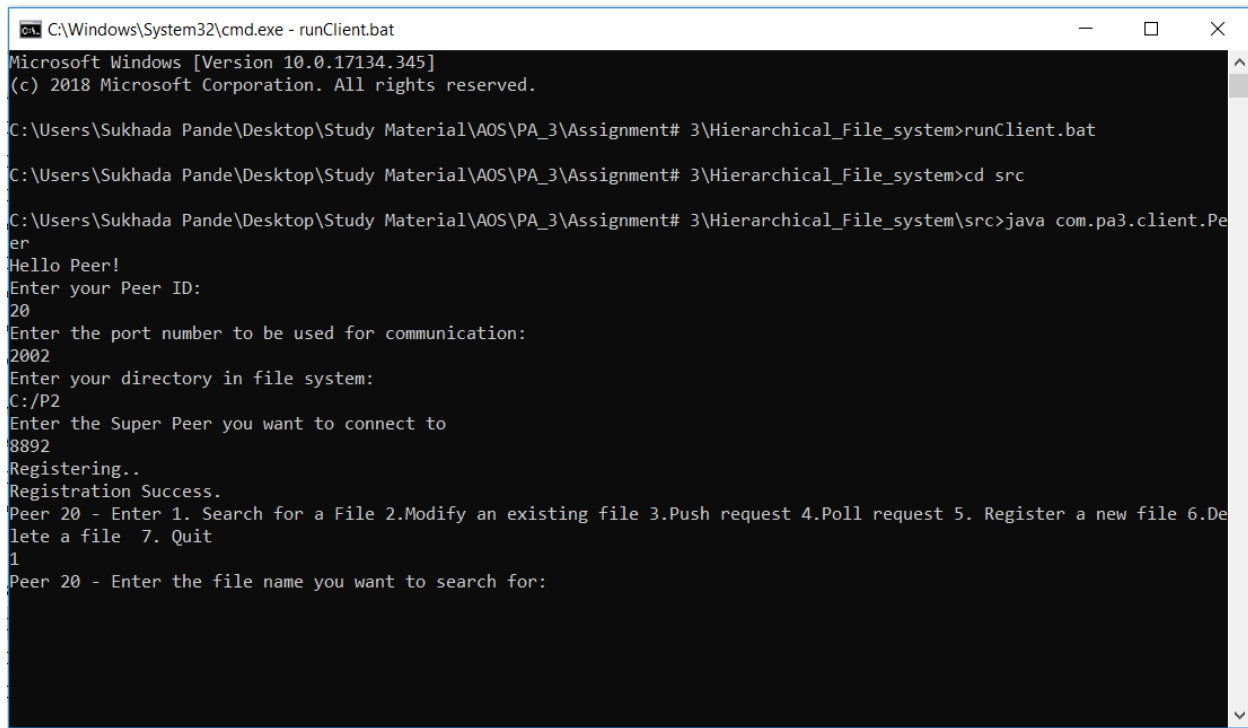


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C:\Windows\System32\cmd.exe - initiateServer.bat                          —    □    ✕

Microsoft Windows [Version 10.0.17134.345]
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C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\Assignment# 3\Hierarchical_File_system>initiateServer.bat

C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\Assignment# 3\Hierarchical_File_system>cd src

C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\Assignment# 3\Hierarchical_File_system\src>java com.pa3.server.Se
rver
Enter the port number to bind the Server:
8891
Server is ready!
```

Step -6 : Open up as many servers as much super-peers you want to launch.

Launching Clients:

Step-1 : To start a peer leaf-node . Launch another command prompt window and run runClient.bat file. We get the following instructions:

- Enter the Peer id : Peer id on which you want peer to be launched on. E.g. . 10 .Remember this should be unique
- Enter the Port no for communication .E.g. 1001. Remember this should be unique.
- Enter your directory in file system: Enter the directory whose file you want to register to your super peer. This should be in your file system. E.g. C/P1
- Enter the Super Peer you want to connect to: Enter the port number of super-peer you want to connect to. Make sure the server with that port is already launch.
- If is registration is successful we get "Registration Success" message.
- Further we get the options to perform the "Search a file " , "Modify a file ","Push request", "Pull request", "Register a file" , "Delete a file" , or "Quit".
-

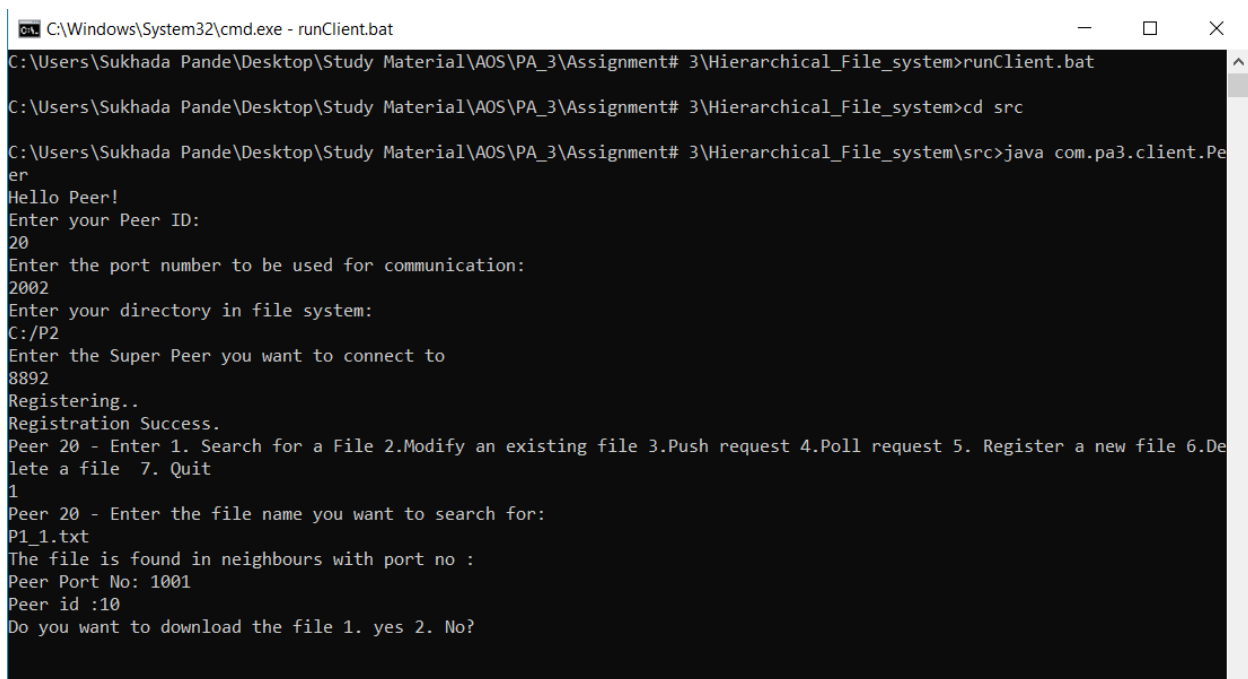Step-2 :By selecting option "1" , if want you can search for a file .

Step-3 : Enter the file you want to search E.g. P1_2.txt. Make a note that the peer should know which file it is searching for and file name is case sensitive.
Once we search for the file it returns the port no and leaf peer id where the file is available.

Step -4: It gives you two options, to download the file or not. Once you select to download.

```
C:\Windows\System32\cmd.exe - runClient.bat                                              —    □    X

C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\Assignment# 3\Hierarchical_File_system>runClient.bat

C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\Assignment# 3\Hierarchical_File_system>cd src

C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\Assignment# 3\Hierarchical_File_system\src>java com.pa3.client.Pe
er
Hello Peer!
Enter your Peer ID:
20
Enter the port number to be used for communication:
2002
Enter your directory in file system:
C:/P2
Enter the Super Peer you want to connect to
8892
Registering..
Registration Success.
Peer 20 - Enter 1. Search for a File 2.Modify an existing file 3.Push request 4.Poll request 5. Register a new file 6.De
lete a file  7. Quit
1
Peer 20 - Enter the file name you want to search for:
P1_1.txt
The file is found in neighbours with port no :
Peer Port No: 1001
Peer id :10
Do you want to download the file 1. yes 2. No?
1
Enter the peer port from which you want to download the file:
```

Step- 5: Enter the port number from where we want to download the file . E.g. 1001.

```
C:\Windows\System32\cmd.exe - runClient.bat                                              —    □    X

C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\Assignment# 3\Hierarchical_File_system\src>java com.pa3.client.Pe
er
Hello Peer!
Enter your Peer ID:
20
Enter the port number to be used for communication:
2002
Enter your directory in file system:
C:/P2
Enter the Super Peer you want to connect to
8892
Registering..
Registration Success.
Peer 20 - Enter 1. Search for a File 2.Modify an existing file 3.Push request 4.Poll request 5. Register a new file 6.De
lete a file  7. Quit
1
Peer 20 - Enter the file name you want to search for:
P1_1.txt
The file is found in neighbours with port no :
Peer Port No: 1001
Peer id :10
Do you want to download the file 1. yes 2. No?
1
Enter the peer port from which you want to download the file:
1001
20
File successfully downloaded !!
```

The file is successfully downloaded to the folder of peer from which we sent the request.

Modify file :

Step 1: Select the option 2 to modify only file from the leaf-peer.

Step 2: Enter the file you want to modify. Note : Make sure you modify the file content in the file system and save it .

Once you modify the file you will get the following modified file message on the peer and the below message on their Super-Peer to which the peer is connected to :

Step 3: It gives you option to Push the modified file changes to the other leaf-node ,and make the invalid.

If you try to modify a file not owned by the Super-peer of to which leaf node is connected to , you will receive a message saying "File not owned by server cannot modify"

Push Approach :

Once you have modified a file , we get an option where if you want to Push the message throughout the leaf-peers to invalidate the file which are of different version than that of the original file .

Select 1 , to send a invalidate message to all the peers connected in the network.
Once the push message is propagated throughout the network we get a message as in the below screenshot.

And the server where the file version is old we get a message with the version no. of the file as below .

Refresh Scheduler :

Follow the Step 1 -2 of modification of file.

Step 1: Launch another command prompt window and run Refreshscheduler.bat file. This will trigger a scheduler which will mark all the downloaded file in any peer , as Time-to-refresh true , if the time they have been downloaded and the standard time to refresh that file is expired.

We will get the Super-peer which are connected port no:

On the Super-peer to where the file needs to be refreshed , we receive a message saying Time to refresh "Filename" and of which leaf-node it needs to be updated.

For eg in our case we had downloaded P1_1.txt from Peer Id:10 in leaf-node with Peer id: 20 , Then modified the file from Peer id :10 , thus we receive a message on the super-peer of peer id:20 , to refresh the corresponding file.

```
C:\Windows\System32\cmd.exe - initiateServer.bat                          —    □    ×

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C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\530_updated\Hierarchical_File_system>initiateServer.bat

C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\530_updated\Hierarchical_File_system>cd src

C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\530_updated\Hierarchical_File_system\src>java com.pa3.server.Serv
er
Enter the port number to bind the Server:
8892
Server is ready!
Registering Peer 20
Successfully Registered peer 20
Loading the config file
Sending request to peerid.1 8891
Time to live 10
File Searched
File found in peer with Port No: 1001
Sending request to peerid.3 8893
Time to live 9
File Searched
 Downloaded [P1_1.txt] File added successfully
 Its time to refresh P1_1.txtof 20
```
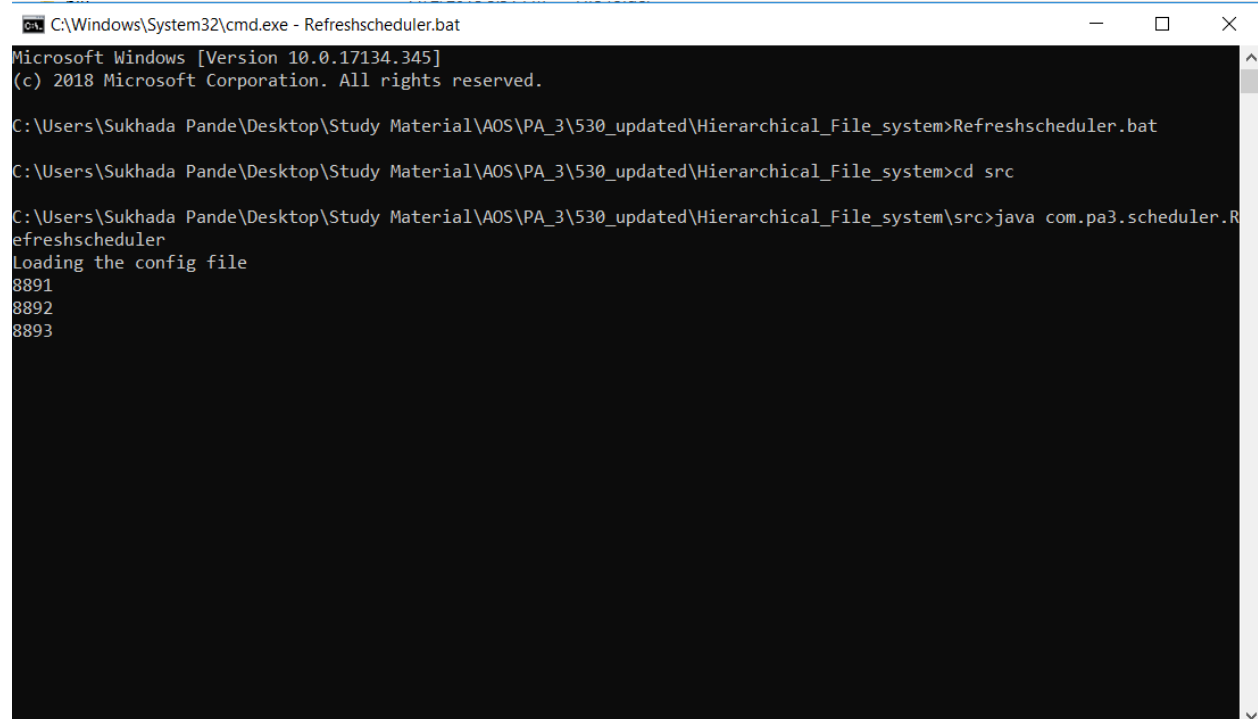
Pull type 1:
Here we use scheduler to check the version of all the file which have being marked as TTR expired.
Every super-peer if any file is TTR expired and will check its version with the respective super-peer, if the version is expired it will delete the cached version. For launching the scheduler follow below steps:

Step 1: Launch another command prompt window and run PullRequestScheduler.bat file

Once you have launched the scheduler it will discard all the downloaded files which were marked as TTR expired whose version is changed.

You will receive a message in the server indicating the file has being removed from the Super-peer whose version is different from that the one in the master copy.

You will receive a "File out of date is removed from list" , if in case you have any cached file.

```
C:\Windows\System32\cmd.exe - initiateServer.bat                              —    □    X
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C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\530_updated\Hierarchical_File_system>initiateServer.bat

C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\530_updated\Hierarchical_File_system>cd src

C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\530_updated\Hierarchical_File_system\src>java com.pa3.server.Serv
er
Enter the port number to bind the Server:
8892
Server is ready!
Registering Peer 20
Successfully Registered peer 20
Loading the config file
Sending request to peerid.1 8891
Time to live 10
File Searched
File found in peer with Port No: 1001
Sending request to peerid.3 8893
Time to live 9
File Searched
 Downloaded [P1_1.txt] File added successfully
 Its time to refresh P1_1.txtof 20
File out of date removed from the list
```

If you now search for the same file from other peer , you will find only results of file which are valid versions

```
C:\Windows\System32\cmd.exe - runClient.bat                                   —    □    X
Microsoft Windows [Version 10.0.17134.345]
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C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\530_updated\Hierarchical_File_system>runClient.bat

C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\530_updated\Hierarchical_File_system>cd src

C:\Users\Sukhada Pande\Desktop\Study Material\AOS\PA_3\530_updated\Hierarchical_File_system\src>java com.pa3.client.Peer

Hello Peer!
Enter your Peer ID:
30
Enter the port number to be used for communication:
3003
Enter your directory in file system:
C:/P3
Enter the Super Peer you want to connect to
8893
Registering..
Registration Success.
Peer 30 - Enter 1. Search for a File 2.Modify an existing file 3.Push request 4.Poll request 5. Register a new file 6.De
lete a file  7. Quit
1
Peer 30 - Enter the file name you want to search for:
P1_1.txt
The file is found in neighbours with port no :
Peer Port No: 1001
Peer id :10
Do you want to download the file 1. yes 2. No?
```
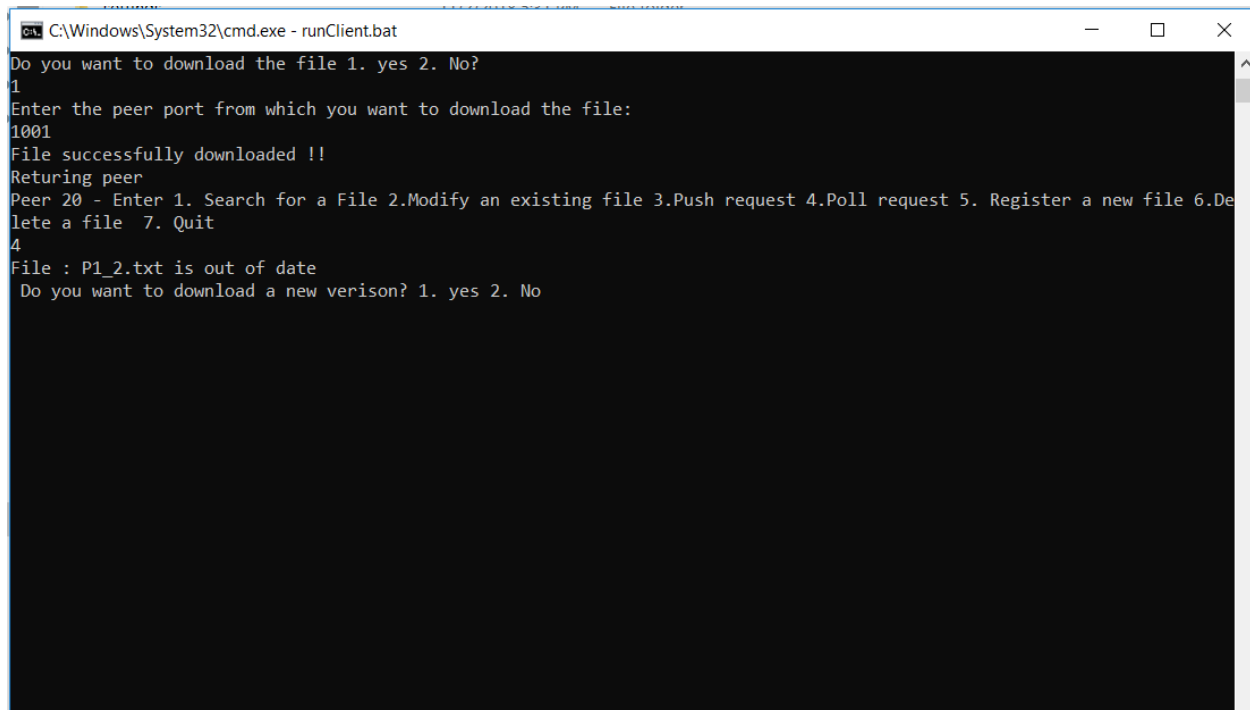
Pull type 2:

Here a Peer itself can ask for a Pull request to check if the file that he has downloaded is in valid version or not.

For that we have to modify a file as per the modification process and run Refreshscheduler.bat file same as Pull 1 approach.

Step-1 : Select option 4 , to send a poll request , this will let the peer check the version of the downloaded files , with the original owner of the file , if the version of file is different , it will return negative and give an option to download a new version of the file.

To download new version of the file , select option 1. Giving message "File successfully downloaded"

```
C:\Windows\System32\cmd.exe - runClient.bat                                          —    □    ×

Peer id :10
Do you want to download the file 1. yes 2. No?
1
Enter the peer port from which you want to download the file:
1001
File successfully downloaded !!
Returing peer
Peer 20 - Enter 1. Search for a File 2.Modify an existing file 3.Push request 4.Poll request 5. Register a new file 6.De
lete a file  7. Quit
1
Peer 20 - Enter the file name you want to search for:
P1_2.txt
The file is found in neighbours with port no :
Peer Port No: 1001
Peer id :10
Do you want to download the file 1. yes 2. No?
1
Enter the peer port from which you want to download the file:
1001
File successfully downloaded !!
Returing peer
Peer 20 - Enter 1. Search for a File 2.Modify an existing file 3.Push request 4.Poll request 5. Register a new file 6.De
lete a file  7. Quit
4
File : P1_2.txt is out of date
 Do you want to download a new verison? 1. yes 2. No
1
1001
File successfully downloaded !!
Returing peer
```