

9331 Assignment

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Program design process:

I follow the instructions showed in the slides because these commands have the sequential order, and some have similar logic.

- Implement one command, test it thoroughly, move to the next
- Suggest the following order: XIT, CRT, LST, MSG, RDT, EDT, DLT, UPD, DWN, RMV, SHT

I didn't implement functionality for handling multiple concurrent clients.

For most command cases, I make sub-functions to ease the code quantity.

I first implemented 'XIT' which means client disconnects while server is still on.

Then, I implemented 'CRT' which first check if thread already exist, and if not, it will create a new empty thread with the format of txt file.

```
z5239803@vx8:/tmp_and/glass/export,z5239803@vx8:/tmp_and/glass/export/glass/1/z5239803/Desktop/9331 Lab/exercise$ p
python Server.py 2000 love      ython Client.py 127.0.0.1 2000
Waiting for clients             Enter username: laifu
Client connected                Enter password: laifu
laifu successful login           Welcome to the forum
laifu issued CRT command        Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
Thread 123 created              , XIT, SHT: CRT 123
laifu issued CRT command        Thread 123 created
Thread 123 exists               Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
                                , XIT, SHT: CRT 123
                                Thread 123 exists
                                Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
                                , XIT, SHT: █
```

I implemented 'LST' which scans the folder to find active threads, which have been posted.

```
laifu issued LST command        Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
                                , XIT, SHT: LST 123
                                Incorrect syntax for LST
                                Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
                                , XIT, SHT: LST
                                The list of active threads:
                                9331
                                331
                                89
                                123
                                Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
                                , XIT, SHT: █
```

For 'MSG', 'RDT', server need to ensure whether the target thread exist, if so, then the server post message in target thread when 'MSG' and server display all the information in target thread when 'RDT'.

RDT 3 cases: 1. incorrect syntax 2. empty thread 3. thread with content

```
z5239803@vx8:/tmp_and/glass/export/glass/1/z5239803/Desktop/9331 Lab/exercise$ p
python Server.py 2000 love      ython Client.py 127.0.0.1 2000
Waiting for clients             Enter username: laifu
Client connected                Enter password: laifu
laifu successful login           Welcome to the forum
laifu issued RDT command        Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
Thread 123 read                  , XIT, SHT: RDT
laifu issued RDT command        Incorrect syntax for RDT
Thread 331 read                  Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
                                , XIT, SHT: RDT 123
                                Thread 123 is empty
                                Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
                                , XIT, SHT: RDT 331
                                1 laifu: haolaifu
                                laifu uploaded index.jpeg
```

For 'MSG', I only consider one case as the specification says:

MSG threadname message, if the command contains MSG but not in the standard form, It will not work.

```
laifu issued MSG command        Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
laifu posted to 123 thread      , XIT, SHT: RDT 123
laifu issued RDT command        Thread 123 is empty
Thread 123 read                  Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
                                , XIT, SHT: MSG 123 laifu good cat
                                Message posted to 123 thread
                                Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
                                , XIT, SHT: RDT 123
                                1 laifu: laifu good cat
```

For 'EDT' and 'DLT', it's bit more complicated than others.

For 'EDT', there are four cases: 1. thread doesn't exist

2. the message number is invalid (generally larger than existing numbers)

3. the number matches, but the message is posted by others

4. msg number matches and username matches

```
laifu issued EDT command        Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
Thread does not exist            , XIT, SHT: EDT 555 1 memes
laifu issued EDT command        The thread does not exist
Message number invalid           Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
laifu issued EDT command        , XIT, SHT: EDT 9331 6 memes
Message cannot be edited         The message number is invalid
laifu issued EDT command        Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
Message has been edited          , XIT, SHT: EDT 9331 2 memes
                                The message belongs to another user and cannot be edited
                                Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
                                , XIT, SHT: EDT 9331 4 memes
                                The message has been edited
                                Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
                                , XIT, SHT: █
```

For 'DLT', the four cases are similar with 'EDT':

1. thread doesn't exist
2. the message number is invalid (generally larger than existing numbers)
3. the number matches, but the message is posted by others
4. msg number matches and username matches

One of the main differences between 'EDT' and 'DLT' is when dealing with lines, 'EDT' use expected message to overwrite previous message, while 'DLT' use blank " " to overwrite previous message. The logic behind these two functions is very similar.

```
Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
, XIT, SHT: RDT 9331
1 Yoda: cute laifu
2 Yoda: QT laifu
3 niuniu: haolaifu
4 laifu: memes

Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
, XIT, SHT: DLT 931 1
The thread does not exist
Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
, XIT, SHT: DLT 9331 6
The message number is invalid
Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
, XIT, SHT: DLT 9331 2
The message belongs to another user and cannot be deleted
Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
, XIT, SHT: DLT 9331 4
The message has been deleted
Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
, XIT, SHT: RDT 9331
1 Yoda: cute laifu
2 Yoda: QT laifu
3 niuniu: haolaifu
```

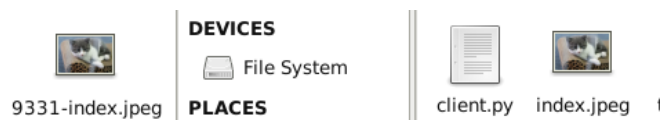
Then I did the 'UPD' and 'DWN'. These two functions have similar logic, and the main difference is reversing sender and receiver.

For 'UPD', I consider there are two cases:

1. Thread does not exist
2. Thread exists, and client can upload

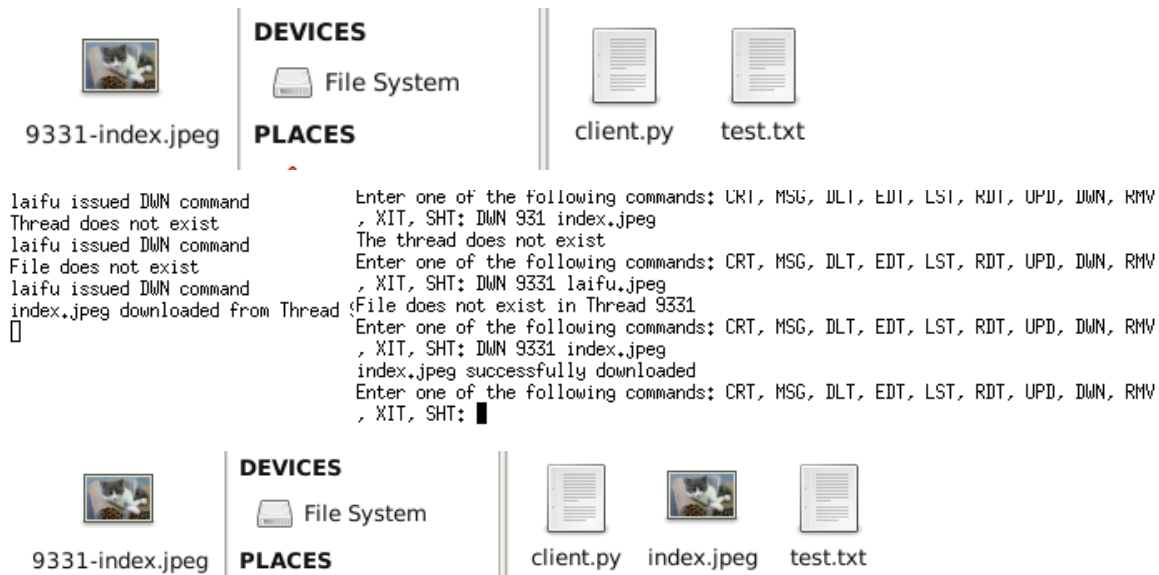
```
laifu issued UPD command
Thread does not exist
laifu issued UPD command
uploaded
]

Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
, XIT, SHT: UPD 931 index.jpeg
The thread does not exist
Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
, XIT, SHT: UPD 9331 index.jpeg
index.jpeg uploaded to 9331 thread
Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV
, XIT, SHT: █
```



For 'DWN', there are three cases:

1. Thread does not exist
2. Thread exists but file doesn't exist
3. Both thread and file exist, and the client can download



Because I have to break the connection after client/server uploaded, and ensure that information in the socket is the file uploaded or downloaded, instead of later commands. After disconnection, I reconnected the client and server.

For 'RMV', it has three cases:

1. Thread does not exist
2. Thread exists but it was created by others (no qualification to remove)
3. Thread exists and qualified to remove.

One thing I almost neglect at the very beginning is when the thread is deleted, the specific document which records the creation should also be removed.

```
laifu issued RMV command
Thread does not exist
laifu issued RMV command
Thread 9331 cannot be removed
laifu issued RMV command
Thread 123 removed
[]
```

Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV, XIT, SHT: RMV 1234
The thread does not exist
Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV, XIT, SHT: RMV 9331
The thread was created by another user and cannot be removed
Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV, XIT, SHT: RMV 123
The thread has been removed
Enter one of the following commands: CRT, MSG, DLT, EDT, LST, RDT, UPD, DWN, RMV, XIT, SHT: █

For the last command 'SHT', there are three possible cases:

1. User types only 'SHT' without password.
2. User types wrong password.
3. User types correct password and system will shut down.

For other unknown commands, it will prompt 'Invalid command'.

Possible improvements

Because Some sub-functions have similar logic, I wrote different definitions for them. In fact, there should be approaches to find common sub-functions which many command functions can call. That will shorten the code and make it efficient.

Besides, for some commands, I only considered the standard form without adding tolerance for format error.

I didn't implement functionality for handling multiple concurrent clients.

I haven't learnt computer networks before. Comp9331 is quite a great course to get theoretical knowledge and practice.