GEBZE TECHNICAL UNIVERSITY
COMPUTER ENGINEERING

SYSTEM PROGRAMING(CSE 344)
FINAL PROJECT

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Problem Defination

In this project, your task is to implement a simplified version of Dropbox. The server side should be capable of handling multiple clients simultaneously, functioning as a multi-threaded internet server. Upon establishing a connection with the server, the directories on both the server and client sides need to be synchronized. This means that any new file created, deleted, or updated on the server should reflect the same changes on the client side, and vice versa.

Unlike the official Dropbox service, your server should also maintain a logfile under the respective client's directory. This logfile should record the names and access times of created, deleted, and updated files. Additionally, it is important to handle SIGINT signal on both the server and client sides.

An example call for the server should be in the following format:

BibakBOXServer [directory] [threadPoolSize] [portnumber]

where the directory is the server's specific area for file operations, threadPoolSize is the maximum number of threads active at a time, and portnumber is the port the server will wait for connection.

An example call from the client might be in the following format:

BibakBOXClient [dirName] [portnumber]

where dirName is the name of the directory on the server side, and portnumber is the connection port of the server.

Note that the client should return with a proper message when the server is down, and the server should prompt a message when a client connection is accepted (with the address of the connection) to the screen.

Test your code with multiple (10, 20, 50) clients, reconnect to see if the server updates the client information properly. Check what happens when a new file is added, edited, or removed on the client side when the client-server connection is still active. Write a report examining at least 5 different cases. Make sure to include testing scenarios where the server and client are running on separate machines.

How to Run the Program

Client

Compile

- gcc -o BibakBOXClient BibakBOXClient.c

Run

- ./BibakBOXClient /home/berkan/Desktop/Final/client/test 4545

Server

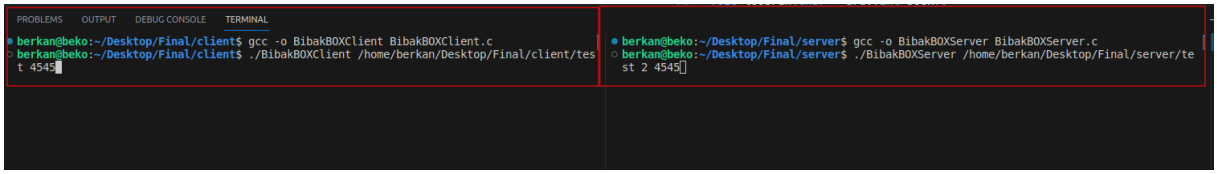
Compile

- gcc -o BibakBOXServer BibakBOXServer.c

Run

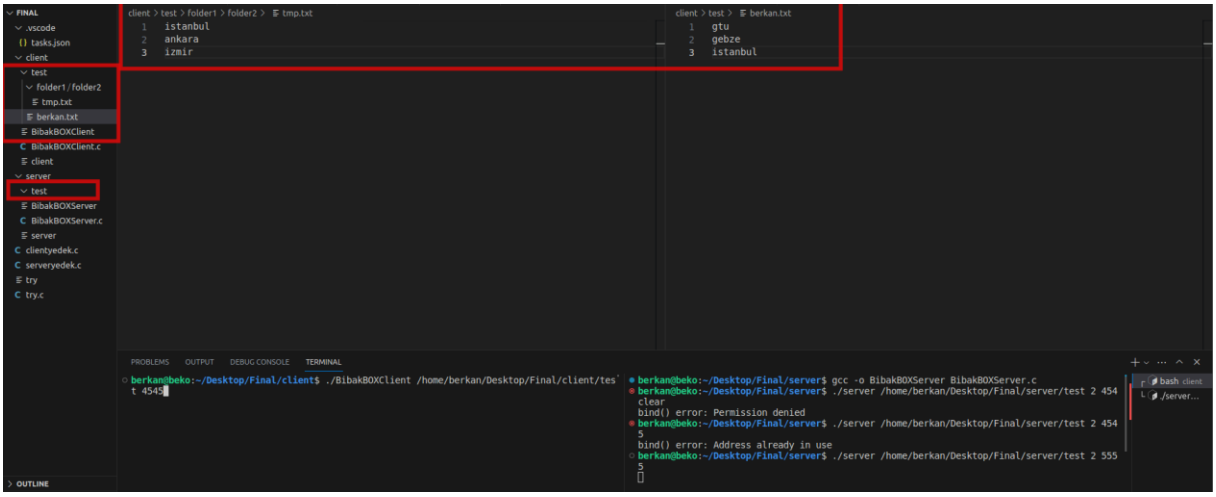
- ./BibakBOXServer /home/berkan/Desktop/Final/server/test 2 4545

Example

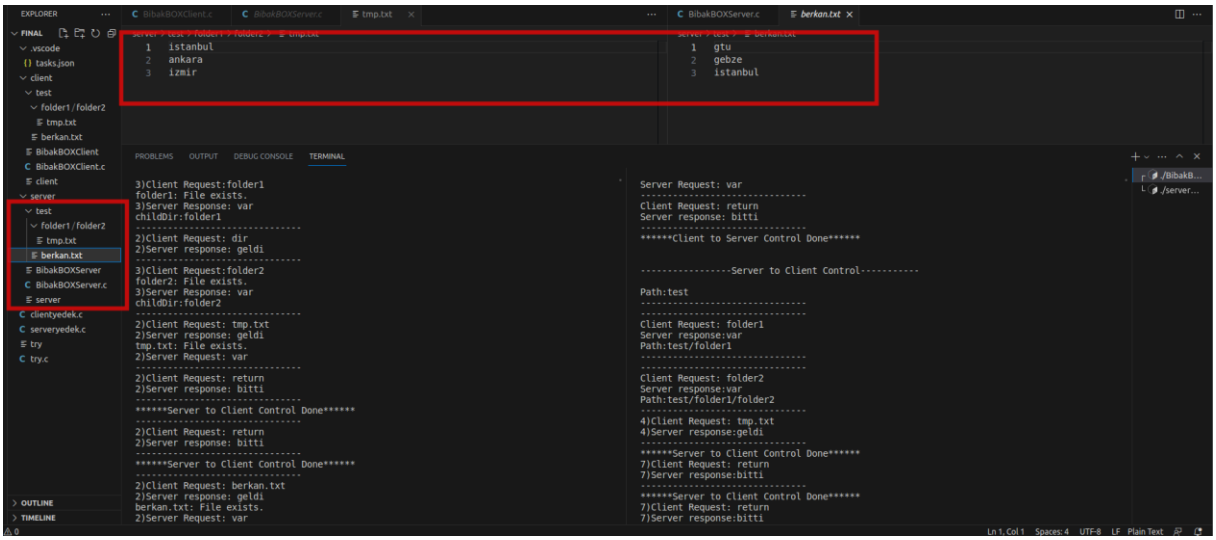


Requirements and Test Case

1) Copying files from client to server.
Copying the contents of the **test** directory on the client to the **test** directory on the server
First Situation in server test folder

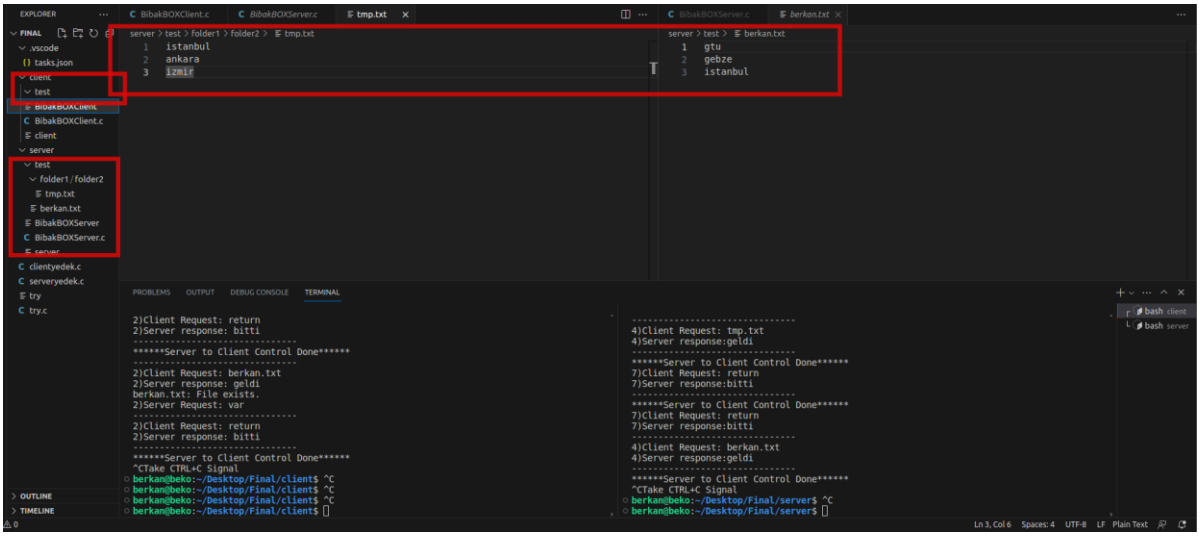


Last Situation in server test folder

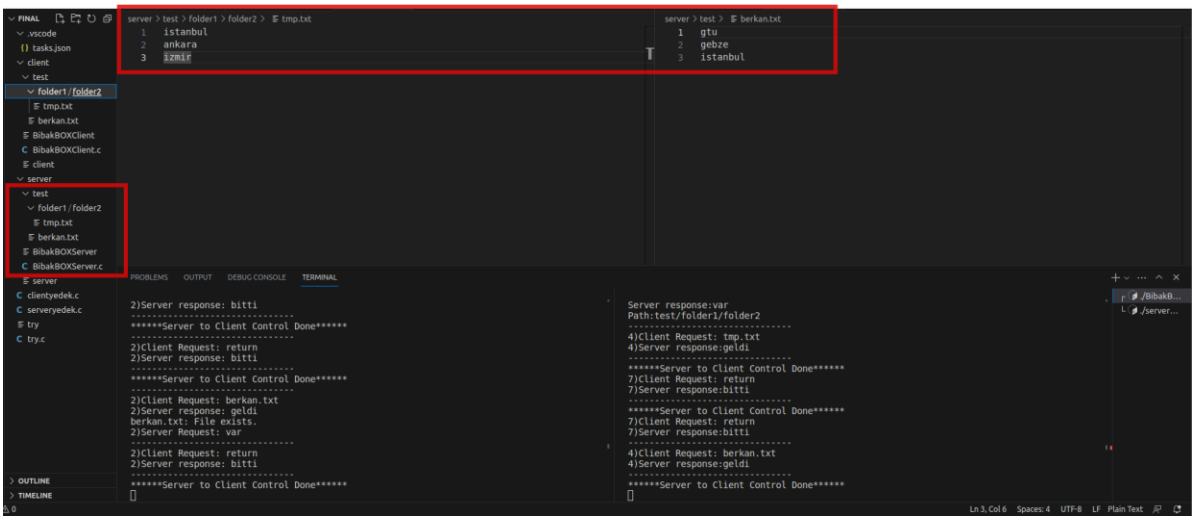


2) Copying files from server to client.
Copying the contents of the test directory on the server to the test directory on the client

First Situation



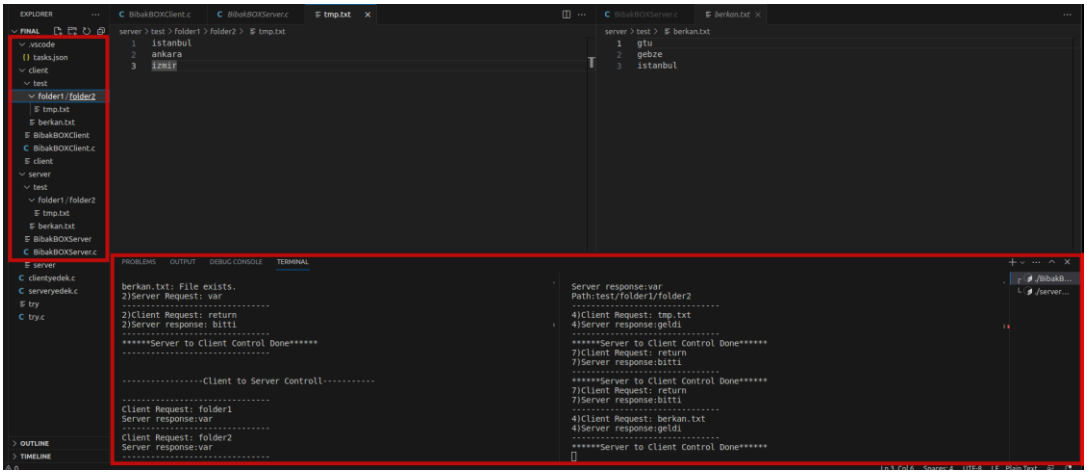
Last Situation



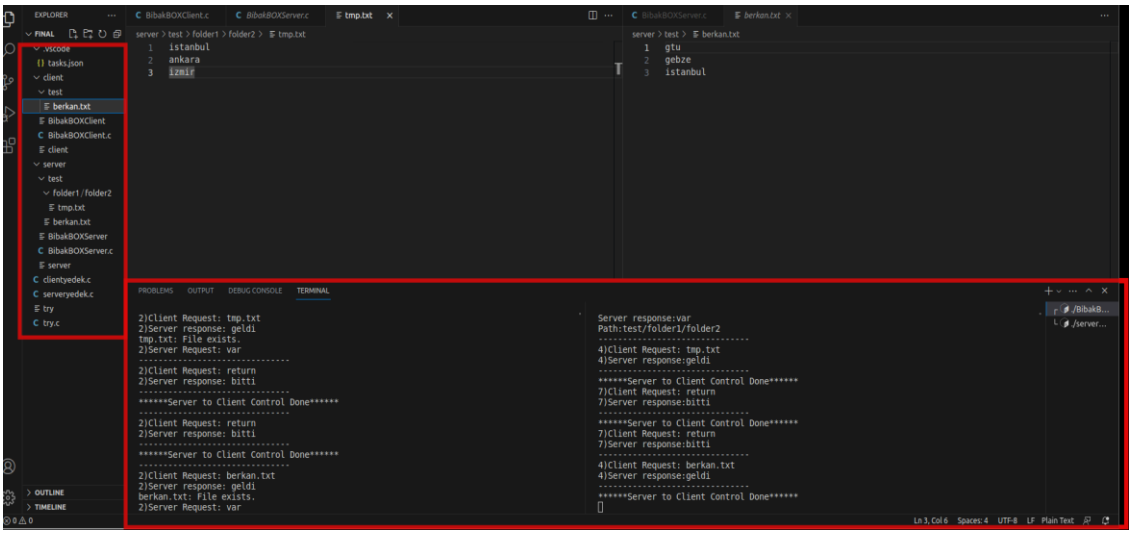
3) Copying Files While the Program is Running

During the execution of the program, the files in the test directory where the client is running were deleted. They were then copied again with the files received from the server.

First Situation

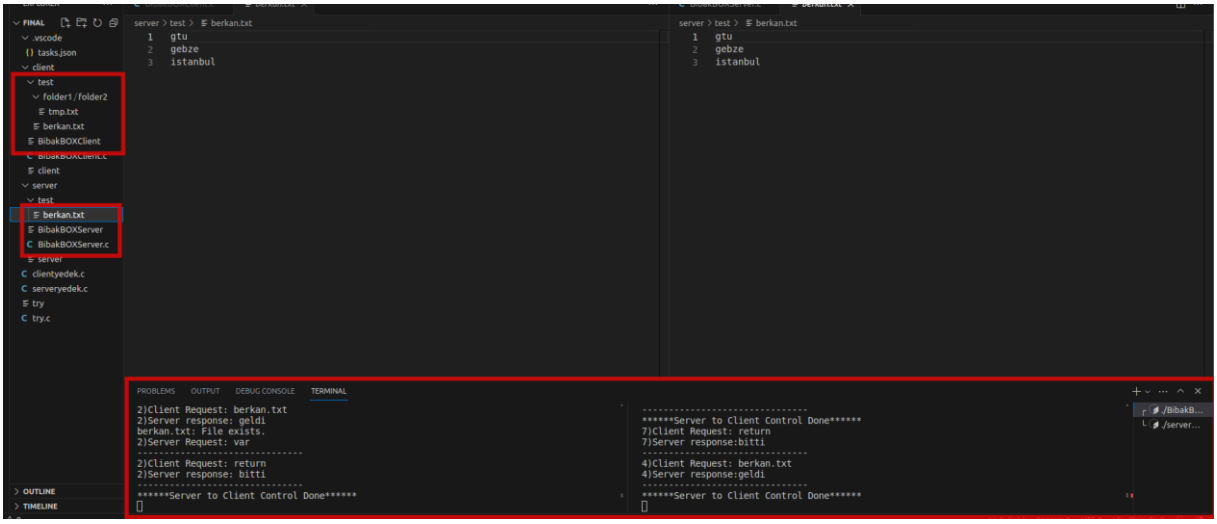


Last Situation

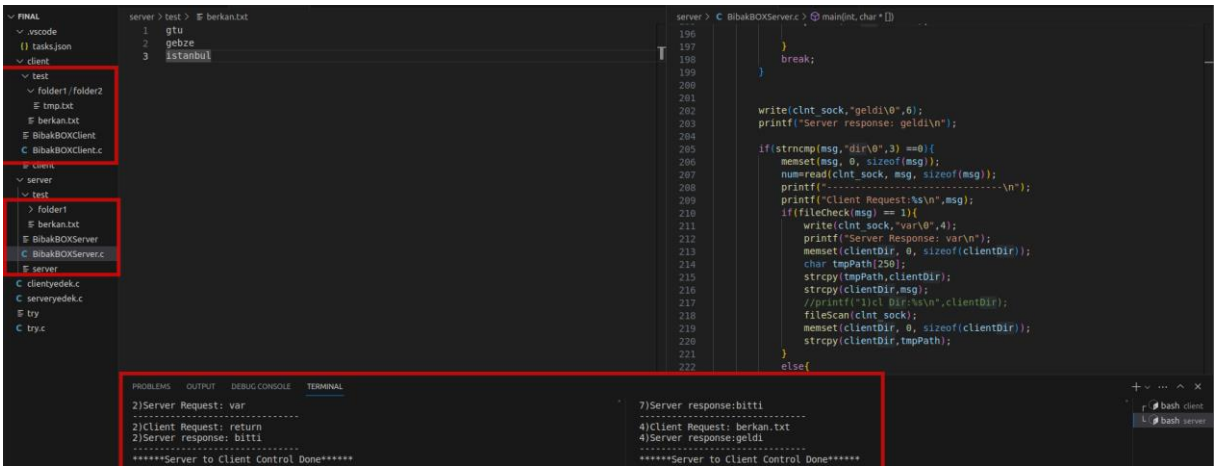


The files that were deleted from the server's test directory are being placed back in the same location.

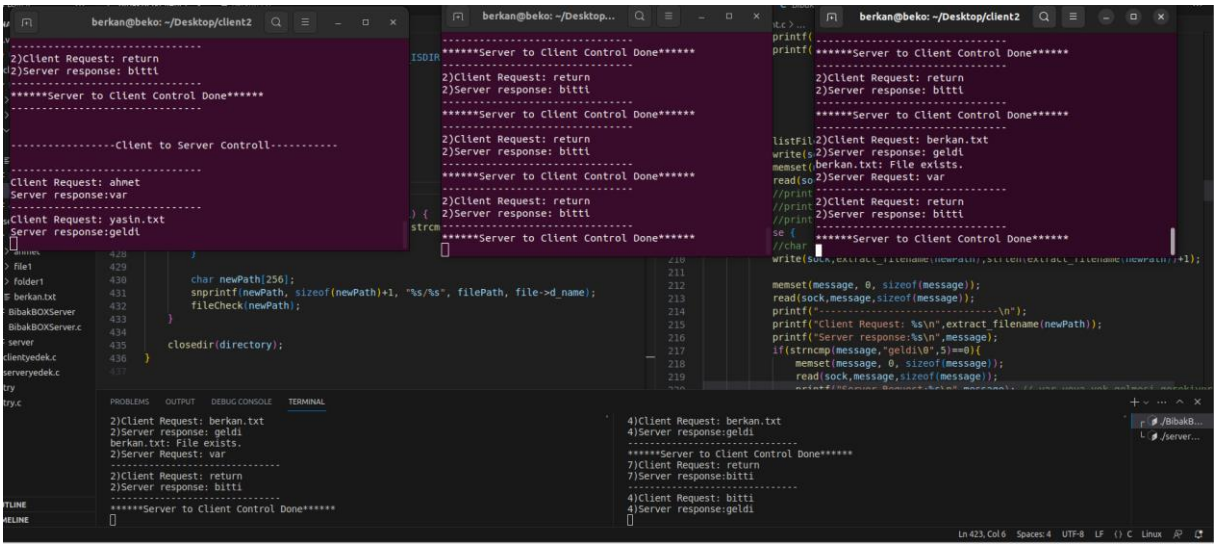
First Situation



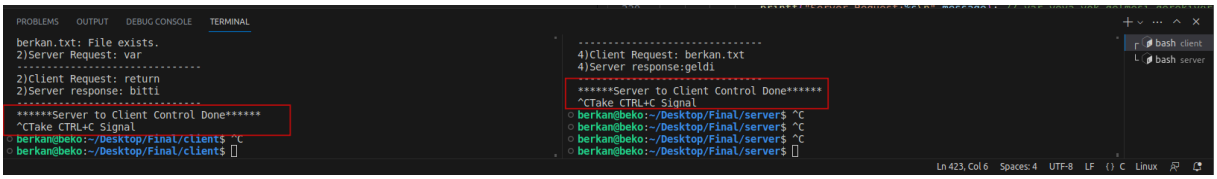
Last Situation



4) Multiple programs running at the same time.



5) Signal Handling



Code Snippet

```
void signal_handler(int signal_number) {
    if (signal_number == SIGINT) {
        printf("Take CTRL+C Signal \n");
        exit(0);
    }
}
```

6) Running 10, 20 and 50 programs simultaneously.

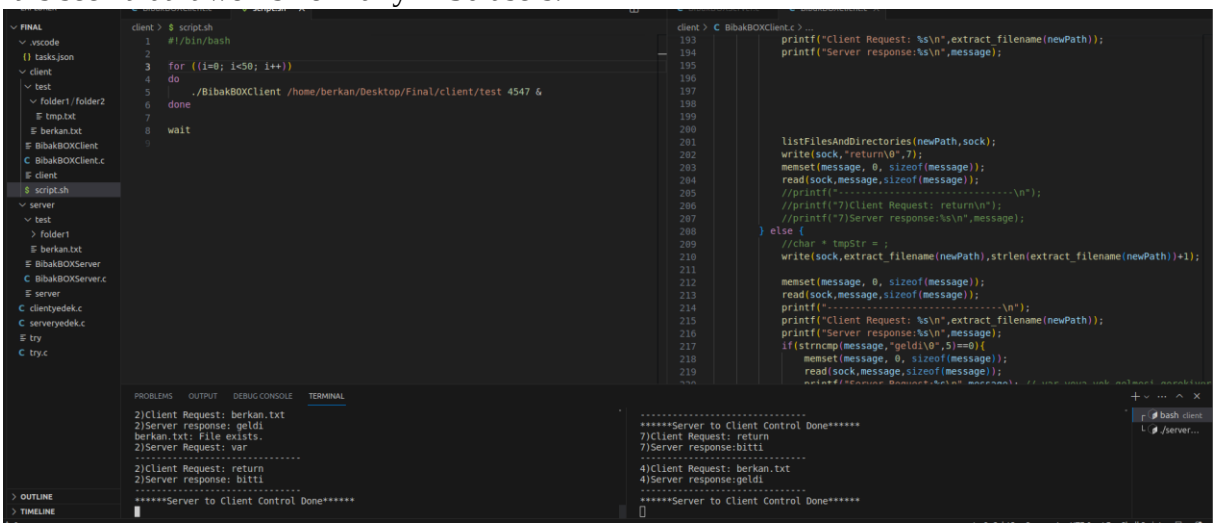
10, 20 and 50 programs were run at the same time and the server was able to respond to this client.

```
client > $ script.sh
#!/bin/bash

for ((i=0; i<10; i++))
do
    ./BibakBOXClient /home/berkan/Desktop/Final/client/test 4547 &
done

wait
```

```
nt > $ script.sh
#!/bin/bash

for ((i=0; i<20; i++))
do
    ./BibakBOXClient /home/berkan/Desktop/Final/client/test 4547 &
done

wait
```

```
ent > $ script.sh
#!/bin/bash

for ((i=0; i<50; i++))
do
    ./BibakBOXClient /home/berkan/Desktop/Final/client/test 4547 &
done

wait
```

It is seen that it works normally in 50 users.



Note

- update and delete operations are not done in the program