GEBZE TECHNICAL UNIVERSITY COMPUTER ENGINEERING

SYSTEM PROGRAMMING LECTURE

FINAL

FINAL REPORT

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JUNE 17

Design Decisions and Problem Solved Part:

SERVER

After the threads are created in the server part, the server opens the socket and waits for the coming accepts connections. Threads are waiting at the synchronization barrier, just like the client. In order not to lose each incoming connection, we queue it. Since the queue object is global, we ensure synchronization with the mutex. After it is sent to the queue, we send a signal (not broadcast) to enable one of the threads to pull this connection from the thread and take action. With the received request, we look at which servant is working in which interval and if there is city information, we connect to the relevant servant and send the request. If there is no city information, we send the request to all servants and forward the incoming data to the client.

SERVANT

According to the information given from the console in the server, we learn which city range to look at and read from the file. Then we save this data to the directory structure and hashmap. We get the city names as hashmap keys and the structure of the relevant city as value. First of all, the Servant connects to the server and sends its IP address, port number, information about which cities it is

responsible for, and its id. Then it opens a socket and waits for the connections to come from the server. It creates a new thread according to the incoming connects and handles that request. The necessary information is obtained by comparing the information of the cities where the incoming request and the servant are related, and it returns the answer to the server. The server takes the last result and sends it to the client.

CLIENT

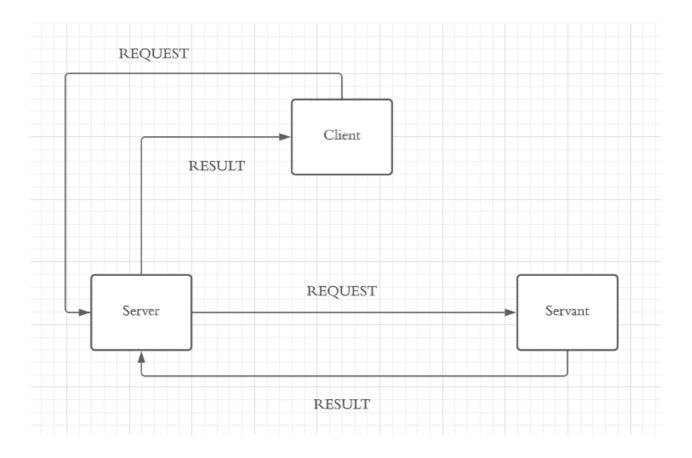
First of all, the request file was read in the client.c file and the data was saved. Then threads are created. The threads were kept in the synchronization barrier. After all the threads reached the barrier, they all worked at once. Then they made a connection with the server and forwarded the requests to the server and began to wait for the response.

Which requirements I achieved:

I followed the instructions in the pdf. I learned sockets, I gained practicality in thread and mutex.

Which requirements I failed:

There is memory leak because of the scandir function in servant.c file.



RESULTS

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Servant 384: loaded dataset, cities ADANA-ARDAHAN
Time 02:49:36:846 :Servant 384 present at port 46823 handling cities ADANA-ARDAHAN
Servant 384: listening at port 46823
Servant 387: loaded dataset, cities EDIRNE-HAKKARI
Servant 385: loaded dataset, cities ARTVIN-BITLIS
Servant 385: listening at port 37535
Time 02:49:36:846 :Servant 387 present at port 33301 handling cities EDIRNE-HAKKARI
Time 02:49:36:846 :Servant 385 present at port 37535 handling cities ARTVIN-BITLIS
Servant 387: listening at port 33301
Servant 390: loaded dataset, cities MALATYA-ORDU
Time 02:49:36:849 :Servant 390 present at port 49029 handling cities MALATYA-ORDU
Servant 390: listening at port 49029
Servant 389: loaded dataset, cities KASTAMONU-KUTAHYA
Servant 391: loaded dataset, cities OSMANIYE-SIVAS
Servant 389: listening at port 48075
Time 02:49:36:849 :Servant 389 present at port 48075 handling cities KASTAMONU-KUTAHYA
Servant 391: listening at port 50917
Time 02:49:36:849 :Servant 391 present at port 50917 handling cities OSMANIYE-SIVAS
Servant 392: loaded dataset, cities TEKIRDAG-ZONGULDAK
Servant 392: listening at port 39539
Time 02:49:36:852 :Servant 392 present at port 39539 handling cities TEKIRDAG-ZONGULDAK
Servant 388: loaded dataset, cities HATAY-KARS
Servant 388: listening at port 48273
Time 02:49:36:853 :Servant 388 present at port 48273 handling cities HATAY-KARS
Servant 386: loaded dataset, cities BOLU-DUZCE
Servant 386: listening at port 36623
Time 02:49:36:855 :Servant 386 present at port 36623 handling cities BOLU-DUZCE
Client: I have loaded 10 requests and I'm creating 10 threads.
Client-Thread-0: Thread-0 has been created
Client-Thread-0: I am requesting "transactionCount TARLA 01-01-2073 30-12-2074 ADANA"
Client-Thread-2: Thread-2 has been created
Client-Thread-3: Thread-3 has been created
Client-Thread-1: Thread-1 has been created
Client-Thread-4: Thread-4 has been created
Client-Thread-4: I am requesting "transactionCount FIDANLIK 02-09-2016 12-09-2081 BALIKESIR"
Client-Thread-5: Thread-5 has been created
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Client-Thread-9: Thread-9 has been created
Client-Thread-9: I am requesting "transactionCount IMALATHANE 04-06-2004 11-11-2011 ISPARTA"
Time 02:49:39:829 :Request arrived "transactionCount IMALATHANE 04-06-2004 11-11-2011 ISPARTA"
Time 02:49:39:829 :Contacting servant 48273
Time 02:49:39:829 :Request arrived "transactionCount FABRIKA 22-07-2004 11-05-2072 ANKARA"
Time 02:49:39:829 :Contacting servant 46823
Time 02:49:39:829 :Request arrived "transactionCount VILLA 22-04-2049 20-03-2061"
Time 02:49:39:829 :Contacting ALL Servants
Time 02:49:39:829 :Request arrived "transactionCount BAG 01-12-2004 27-09-2089 ADIYAMAN"
Time 02:49:39:830 :Contacting servant 46823
Time 02:49:39:830 :Response received: 4, forwarded to client
Client-Thread-9: The server's response to "transactionCount IMALATHANE 04-06-2004 11-11-2011 ISPARTA" is
Client-Thread-9: Terminating
Time 02:49:39:830 :Response received: 4, forwarded to client
Time 02:49:39:830 :Request arrived "transactionCount MERA 03-02-2018 09-11-2050"
Time 02:49:39:830 :Request arrived "transactionCount BAHCE 02-03-2005 17-01-2084"
Time 02:49:39:830 :Request arrived "transactionCount TARLA 01-01-2073 30-12-2074 ADANA"
Client-Thread-6: The server's response to "transactionCount FABRIKA 22-07-2004 11-05-2072 ANKARA" is 4
Time 02:49:39:830 :Request arrived "transactionCount DUKKAN 20-04-2000 23-01-2031 KILIS"
Client-Thread-6: Terminating
Time 02:49:39:830 :Time 02:49:39:830 :Response received: 5, forwarded to client
Contacting ALL Servants
Time 02:49:39:830 :Contacting servant 48075
Time 02:49:39:830 :Contacting ALL Servants
Client-Thread-3: The server's response to "transactionCount BAG 01-12-2004 27-09-2089 ADIYAMAN" is 5
Client-Thread-3: Terminating
Time 02:49:39:830 :Contacting ALL Servants
Time 02:49:39:830 :Contacting servant 46823
Time 02:49:39:830 :Request arrived "transactionCount AMBAR 28-01-2044 13-09-2050 AKSARAY"
Time 02:49:39:830 :Contacting servant 46823
Time 02:49:39:830 :Response received: 1, forwarded to client
Client-Thread-2: The server's response to "transactionCount DUKKAN 20-04-2000 23-01-2031 KILIS" is 1
Time 02:49:39:830 :Request arrived "transactionCount FIDANLIK 02-09-2016 12-09-2081 BALIKESIR"
Client-Thread-2: Terminating
Time 02:49:39:830 :Contacting servant 37535
Time 02:49:39:830 :Response received: 0, forwarded to client
Client-Thread-7: The server's response to "transactionCount AMBAR 28-01-2044 13-09-2050 AKSARAY" is 0
Time 02:49:39:830 :Contacting ALL Servants
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Time 02:49:39:830 :Response received: 3, forwarded to client
Client-Thread-4: The server's response to "transactionCount FIDANLIK 02-09-2016 12-09-2081 BALIKESIR" is 3
Client-Thread-4: Terminating
Time 02:49:39:830 :Contacting ALL Servants
Time 02:49:39:830 :Response received: 3, forwarded to client
Client-Thread-0: The server's response to "transactionCount TARLA 01-01-2073 30-12-2074 ADANA" is 3
Client-Thread-0: Terminating
Time 02:49:39:831 :Contacting ALL Servants
Time 02:49:39:832 :Response received: 29, forwarded to client
Time 02:49:39:832 :Contacting ALL Servants
Client-Thread-8: The server's response to "transactionCount VILLA 22-04-2049 20-03-2061" is 29
Client-Thread-8: Terminating
Time 02:49:39:832 :Response received: 342, forwarded to client
Client-Thread-5: The server's response to "transactionCount BAHCE 02-03-2005 17-01-2084" is 342
Time 02:49:39:832 :Response received: 158, forwarded to client
Client-Thread-5: Terminating
Client-Thread-1: The server's response to "transactionCount MERA 03-02-2018 09-11-2050" is 158
Client-Thread-1: Terminating
Client: All threads have terminated
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