

Final Project Report - CSE344

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1 Composition

For this project I used multiple files for readability purposes. There is main.c, parsearg.c, parsearg.h, utils.c, utils.h, types.h, queue.c and queue.h

2 Database functions

This project is separated into 3 parts. One part of it is the part that deals with the database. In There all of the required functions are implemented. Data is stored in a structure. This structure looks as follows.

```
typedef struct Cell{
    char* value;
    struct Cell* next; /*going downwards*/
}Cell;

typedef struct Column{
    char* attr_name;
    Cell* cells;
    struct Column* next_attr;
}Column;

typedef struct Table{
    Column* col_first;
    int attr_n;
}Table;
```

This database has one main function callse **QuerySQL** which is used when a query is processed and is Redirecting the query to either SELECT, SELECT DISTINCT or UPDATE

2.1 Database tests

Here I am showing the output when I tested the database functions

I also performed couple of Updates along the way

```
Output for 'SELECT DISTINCT City FROM TABLE'
City
Berlin
Mexico
London
Lulea

Output for 'SELECT City, Contact, Address, PostalCode FROM TABLE'
City    Contact Address PostalCode
Podgorica Maria Anders Obere Str. 57 12209
Mexico Ana Trujillo Avda. de la Const. 5021
Mexico Antonio Moreno Mataders 2312 5023
London Thomas Hardy 120 Hanover Sq. WA1 1DP
Lulea Christina Berguvsvagen 9 S-928 22

Output for 'SELECT DISTINCT City, Contact, Address, PostalCode FROM TABLE'
City    Contact Address PostalCode
Podgorica Maria Anders Obere Str. 57 12209
Mexico Ana Trujillo Avda. de la Const. 5021
London Antonio Moreno Mataders 2312 5023
Lulea Thomas Hardy 120 Hanover Sq. WA1 1DP
Christina Berguvsvagen 9 S-928 22
PRINTING THE TABLE!!!

Output for 'SELECT * FROM TABLE'
ID      Customer name  Contact Address City    PostalCode    Country
1      Alfreds Maria Anders Obere Str. 57 Podgorica 12209 Germany
2      Ana Trujillo Ana Trujillo Avda. de la Const. Podgorica 5021 Mexico
3      Antonio Moreno Antonio Moreno Mataders 2312 Istanbul 5023 Mexico
4      Around the Hord Thomas Hardy 120 Hanover Sq. London WA1 1DP UK
5      Berglunds Christina Berguvsvagen 9 Lulea S-928 22 Sweden
```

3 Client

I have a client whose job is pretty simple.

All it does is load the queries that are of its own and stores it in a variable.

After that it establishes the connection with the server.

Now it is ready and will send queries to the server. It will wait for the responses. It reads the response in the chunks of data and exits when the value read is smaller than the maximum value that can be read.

After this it finished and exits.

4 Server

Server is a daemon process. In it there will be a main loop in which connections will be established. When the connection is established, the file descriptor returned is stored in a queue and the signal is sent through a monitor so that an available thread could execute queries sent by that user.

The thread takes the query from the client and depending on the command that is sent it executes either Reader() or Writer(). If the query is 'Select', reader will be executed and if the query is 'Update' than the writer will be executed. Reader Writer paradigm is simply implemented using 4 variable AW WW AR WR. Also conditional variables and mutexes are also used here as we did this in the pseudocode in our class.

Also it is worthy to mention that server doesn't terminate unless that is manually permormed since it is a daemon process. Client terminates on its own of course.

Unfortunately Server sinde of this homework was not implemented correctly and I didn't have time to fix all those bugs. Database and client are working without any problems, only the Server has issues and I don't have time to solve all of them right now. Main logic for the Server is Correct.

5 Tests

Unfortunately, this time my program ended up being very buggy because of the bugs I had in my server.c program so I decided not to put screenshots since the output is not the desired one. Hope I get some well deserved points.