

TÀI LIỆU BÁO CÁO PHẦN MỀM SCORE SCHOOL SYSTEM

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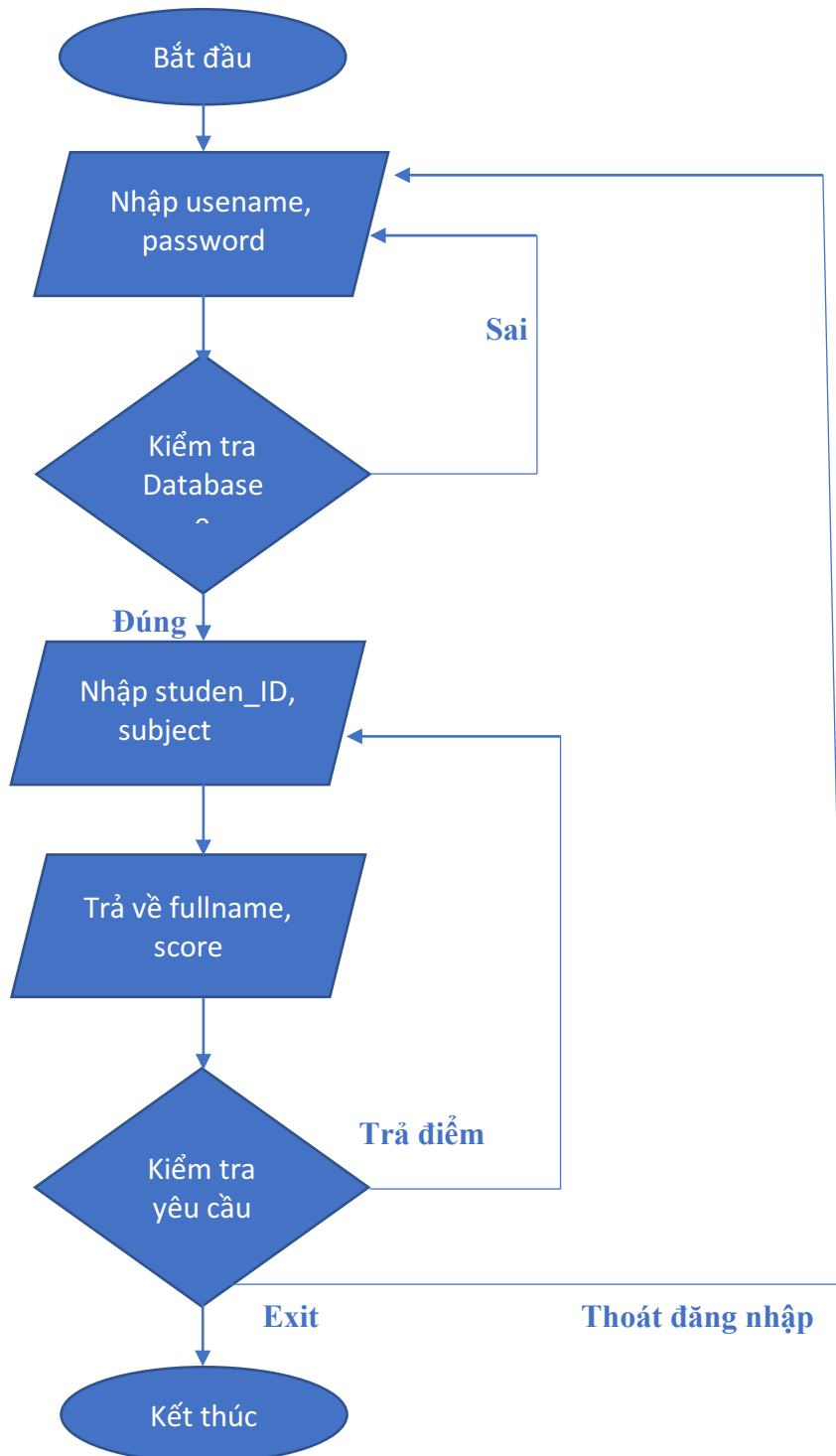
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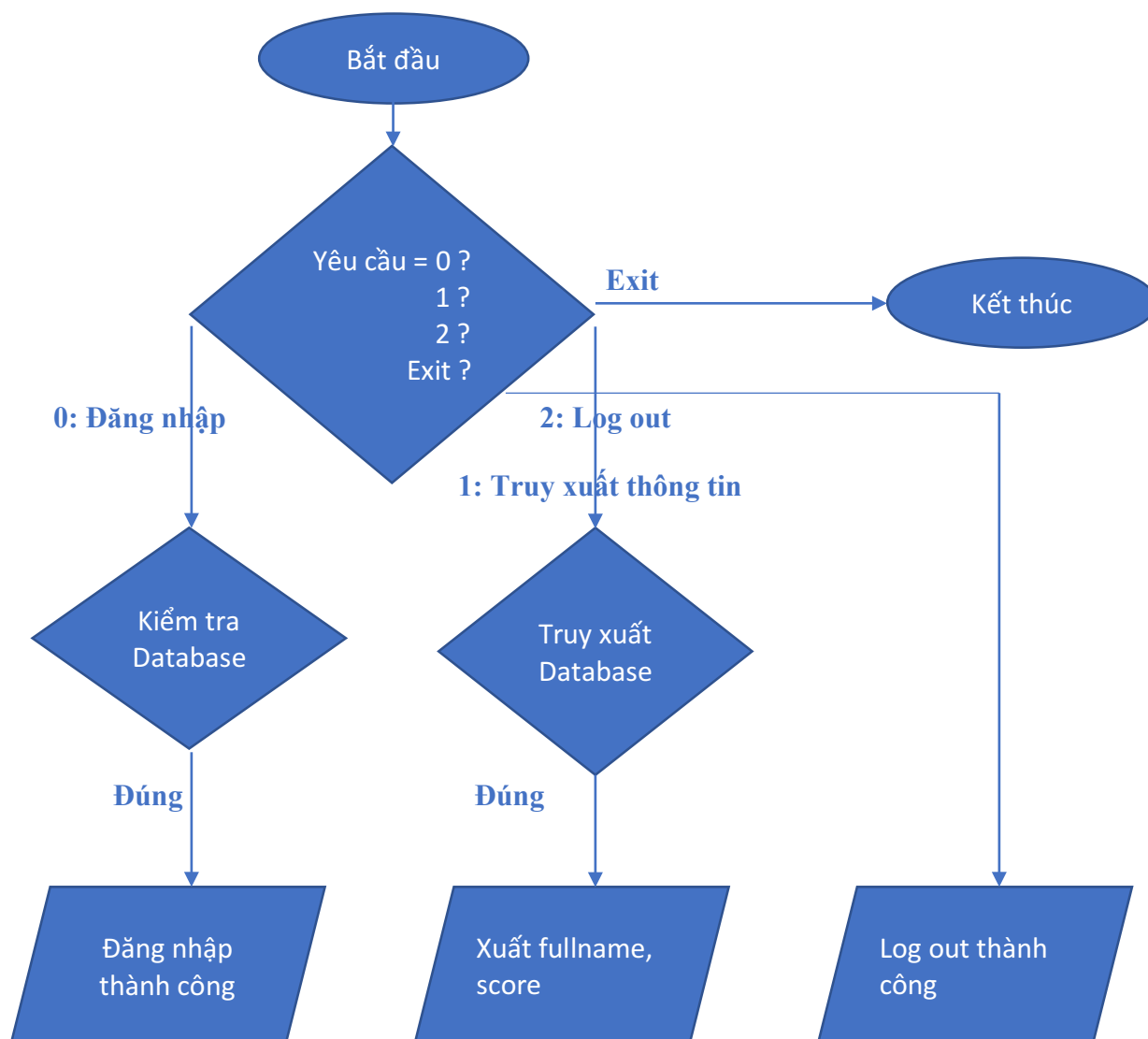
1. SƠ ĐỒ KHỐI GIẢI THUẬT

1.1 Phía Client



Hình 1.1: Sơ đồ khối giải thuật phía Client

1.2 Phía Server



Hình 1.2: Sơ đồ giải thuật phía Server

2 CÁC THƯ VIỆN VÀ HÀM CHÍNH

2.1 Các thư viện chính

- Ngôn ngữ sử dụng: C

- Các thư viện chuẩn của C như:

Thư viện vào ra chuẩn: **<stdio.h>**

Thư viện định nghĩa 4 kiểu biến, macro và các hàm đa dạng để thực hiện các tính năng chung:

<stdlib.h>

Thư viện xử lý chuỗi: **<string.h>**

- Bộ thư viện TCP trên hệ điều hành Linux (Ubuntu) như:

<sys/socket.h> Thư viện tạo socket, kết nối giữa Client và Server.

<unistd.h> Thư viện hàm đọc, ghi bản tin giữa Client và Server.

...

2.2 Các hàm chính

2.2.1 Hàm xử lý kết nối Client - Server cơ bản

- **Server**

+ Server đợi kẻ nối và hồi đáp lại Client

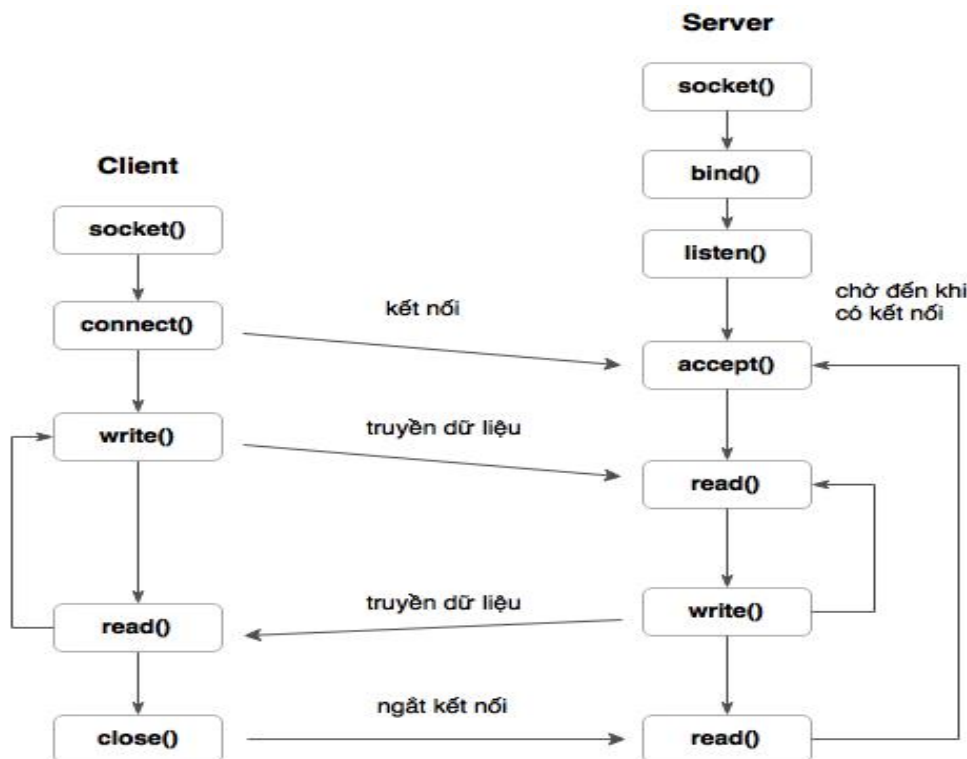
+ Server được kết nối bị động

- **Client**

+ Khởi tạo kết nối

+ Phải biết địa chỉ và cổng kết nối của Server

+ Xác định kết nối



Hình 2.1 Mô hình kết nối Client – Server (TCP)

socket

```
#include <sys/socket.h>
```

```
int socket (int family, int type, int protocol)
```

```
// Return: non-negative descriptor if OK, -1 on error
```

connect

```
#include <sys/socket.h>
```

```
int connect(int sockfd, const struct sockaddr *servaddr, socklen_t addrlen);
```

```
// Return: 0 if OK, -1 on error
```

bind

```
#include <sys/socket.h>
```

```
int bind(int sockfd, const struct sockaddr *myaddr, socklen_t addrlen);
```

```
// Return: 0 if OK, -1 on error
```

listen

```
#include <sys/type.h>
```

```
#include <sys/socket.h>
```

```
int listen(int sockfd, int backlog)
```

accept

```
#include <sys/socket.h>
```

```
int accept(int sockfd, struct sockaddr *cliaddr, socklen_t *addrlen);
```

```
// Return: non-negative descriptor if OK, -1 on error
```

write

```
#include <unistd.h>
```

```
ssize_t write(int fd, const void *buf, size_t count);
```

read

```
#include <unistd.h>
```

```
ssize_t read(int fd, const void *buf, size_t count);
```

2.2.4 Hàm xử lý yêu cầu đăng nhập

```
int checkAccount(student st[], int quantity, char *message);
```

2.2.5 Hàm xử lý yêu cầu truy xuất thông tin và điểm số

```
void handlingScore(student st[], int quantity, char *message, int index, int sd);
```

2.2.6 Hàm xử lý yêu cầu thoát đăng nhập

```
else if (buffer[0] == '2') {
    if (logged == 0) {
        send(sd, RepeatLogIn_Message, strlen(RepeatLogIn_Message), 0);
    }
    else {
        // Exit. Log out
        int j=0;
        for (i=0; i < sizeof(buffer); i++) {
            message[j]=buffer[i+1];
            j++;
        }

        index=-1;
        logged=0;
        send(sd, LogOutSuccess_Message, strlen(LogOutSuccess_Message), 0);
    }
}
```

2.2.7. Hàm xử lý yêu cầu ngắt kết nối Client – Servers

```
else if (strcmp(buffer, "exit")) {
    send(sd, exitClient, strlen(exitClient), 0);
}
```

3 HƯỚNG DẪN CÀI ĐẶT

3.1 Cài đặt phía Server

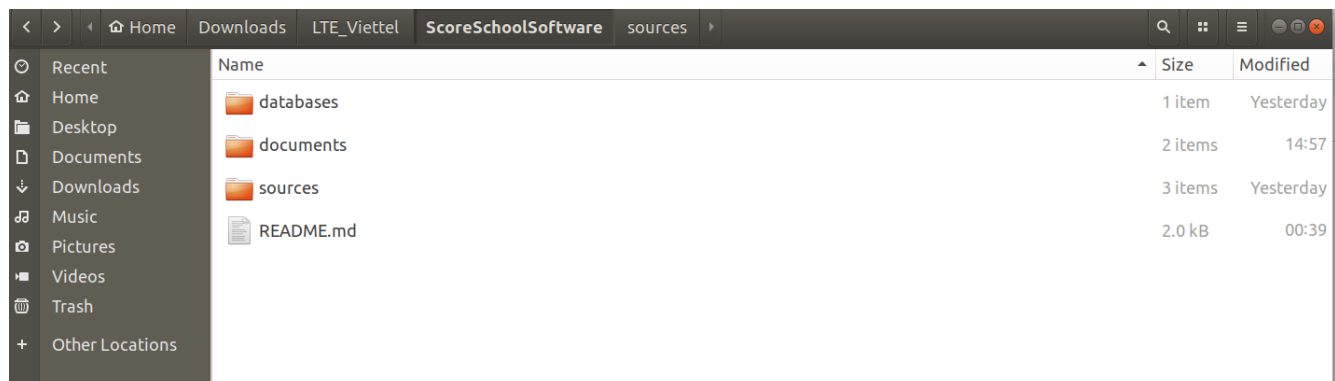
Môi trường Commamd Line, Linux (Ubuntu 18.04.2 LTS, core i5, ram 8G)

B1: Vào giao diện Commad Line

Mở Terminal lên và đi tới thư mục chứa source code bằng lệnh “cd”

Bạn có thể đi tới thư mục chứa source code, rồi nhấn chuột phải, chọn “Open in Terminal”

Note: Bạn cần nhập đúng cú pháp của bản tin để chương trình chạy đúng yêu cầu (Cú pháp đã được nhắc đến trong “Tài liệu thiết kế phần mềm” - design) !



```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Help
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$
```

B2: Thực hiện chạy file .c bằng gcc

Gõ theo cú pháp:

```
gcc server.c -o server
./server
```

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Help
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1.c client2.c server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc server.c -o server
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./server
Waiting for connections ...
```

3.2 Cài đặt phía Client

Hoàn toàn tương tự như cài đặt phía Server, chỉ khác là chạy file “client1.c” hoặc “client2.c” tương ứng với chạy Client 1 hoặc Client2

Hình ảnh phía Client 1

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Scor... x dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Scor... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc client1.c -o client1
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./client1
Socket successfully created..
Connected to the server..
From Server : Hi, I'm a Server. Please log in to continue! [0Username:Password]
Enter the string : █
```

Hình ảnh phía Client 2

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Dow... x dinhnam@dinhnam-MacBookPro: ~/Dow... x dinhnam@dinhnam-MacBookPro: ~/Dow... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1 client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc client2.c -o client2
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./client2
Socket successfully created..
Connected to the server..
From Server : Hi, I'm a Server. Please log in to continue! [0Username:Password]
Enter the string : █
```

4 HƯỚNG DẪN CHẠY VÀ KẾT QUẢ

4.1 Chạy Client 1

- Nhập tài khoản và nhận thông báo thành công

Hình ảnh phía Client 1

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSch... x dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSch... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc client1.c -o client1
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./client1
Socket successfully created..
Connected to the server..
From Server : Hi, I'm a Server. Please log in to continue! [0Username:Password]
Enter the string : 0DinhNamHMU:mainam231299
From Server : Congratulations. Successful login. Can I help you, please! Nguyen Dinh Nam, B15DCVT262.
Enter the string : █
```


Hình ảnh phía Server

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSch... x dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSch... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1.c client2.c server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc server.c -o server
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./server
Waiting for connections ...
New connection!

From Client: 0DinhNamHMU:mainam231299
Username: DinhNamHMU
Password: mainam231299

```

-Nếu tài khoản không đúng sẽ nhận được thông báo lỗi

Hình ảnh phía Client 1

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSch... x dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSch... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc client1.c -o client1
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./client1
Socket successfully created..
Connected to the server..
From Server : Hi, I'm a Server. Please log in to continue! [0Username:Password]
Enter the string : 0DinhNam:mainam231299
From Server : Username or password incorrect. Please log in to continue! [0Username:Password]
Enter the string : 

```

Hình ảnh phía Server

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSch... x dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSch... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc server.c -o server
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./server
Waiting for connections ...
New connection!

From Client: 0DinhNam:mainam231299
Username: DinhNam
Password: mainam231299

```

- Nhập yêu cầu truy xuất thông tin và điểm số

Hình ảnh phía Client 1

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1 client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc client1.c -o client1
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./client1
Socket successfully created..
Connected to the server..
From Server : Hi, I'm a Server. Please log in to continue! [0Username:Password]
Enter the string : 0DinhNamHMMU:mainam231299
From Server : Congratulations. Successful login. Can I help you, please! Nguyen Dinh Nam, B15DCVT262.
Enter the string : 1B15DCVT262:Physic
From Server : Your full name: Nguyen Dinh Nam; Your student ID: B15DCVT262; Physic: 8 score.
Enter the string : █
```

Hình ảnh phía Server

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1 client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc server.c -o server
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./server
Waiting for connections ...
New connection!

From Client: 0DinhNamHMMU:mainam231299
Username: DinhNamHMMU
Password: mainam231299
From Client: 1B15DCVT262:Physic
█
```

- Điểm của tất cả các môn

Hình ảnh phía Client 1

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1 client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc client1.c -o client1
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./client1
Socket successfully created..
Connected to the server..
From Server : Hi, I'm a Server. Please log in to continue! [0Username:Password]
Enter the string : 0DinhNamHMMU:mainam231299
From Server : Congratulations. Successful login. Can I help you, please! Nguyen Dinh Nam, B15DCVT262.
Enter the string : 1B15DCVT262:Physic
From Server : Your full name: Nguyen Dinh Nam; Your student ID: B15DCVT262; Physic: 8 score.
Enter the string : 1B15DCVT262:All
From Server : Math: 7 score; Physic: 8 score; Chemistry: 9 score.
Enter the string : █
```

Hình ảnh phía server

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1 client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc server.c -o server
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./server
Waiting for connections ...
New connection!

From Client: 0DinhNamHMMU:mainam231299
Username: DinhNamHMMU
Password: mainam231299
From Client: 1B15DCVT262:Physic
From Client: 1B15DCVT262:All
█
```

- Thoát đăng nhập

Hình ảnh phía Client 1

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1 client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc client1.c -o client1
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./client1
Socket successfully created..
Connected to the server..
From Server : Hi, I'm a Server. Please log in to continue! [0Username:Password]
Enter the string : 0DinhNamHMMU:mainam231299
From Server : Congratulations. Successful login. Can I help you, please! Nguyen Dinh Nam, B15DCVT262.
Enter the string : 1B15DCVT262:Physic
From Server : Your full name: Nguyen Dinh Nam; Your student ID: B15DCVT262; Physic: 8 score.
Enter the string : 1B15DCVT262:All
From Server : Math: 7 score; Physic: 8 score; Chemistry: 9 score.
Enter the string : 2
From Server : You have logged out. Please log in to continue! [0Username:Password]
Enter the string : █
```

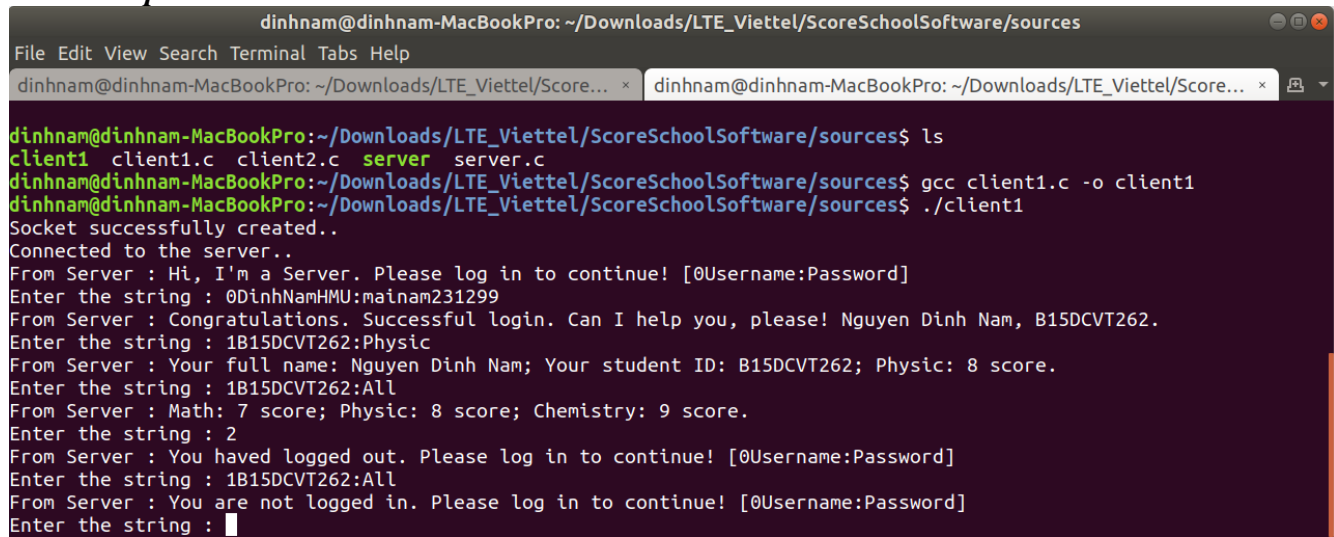
Hình ảnh phía Server

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1 client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc server.c -o server
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./server
Waiting for connections ...
New connection!

From Client: 0DinhNamHMMU:mainam231299
Username: DinhNamHMMU
Password: mainam231299
From Client: 1B15DCVT262:Physic
From Client: 1B15DCVT262:All
From Client: 2
█
```

- Sau khi thoát đăng nhập, yêu cầu truy xuất thông tin và điểm số, sẽ bắt đăng nhập lại để tiếp tục

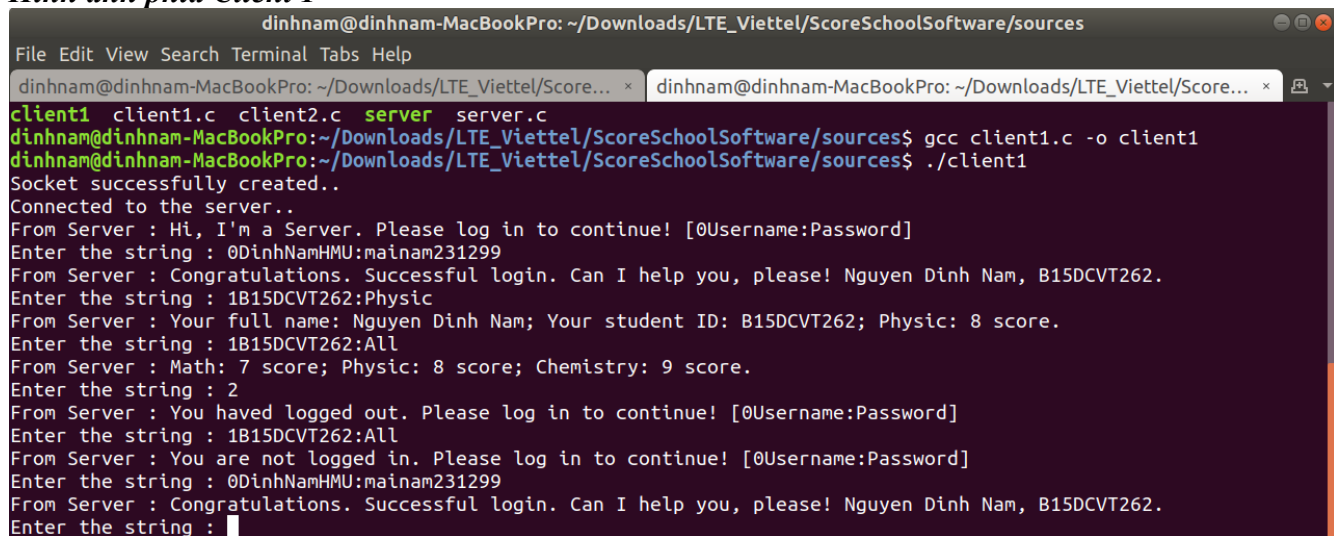
Hình ảnh phía Client 1



```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1 client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc client1.c -o client1
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./client1
Socket successfully created..
Connected to the server..
From Server : Hi, I'm a Server. Please log in to continue! [0Username:Password]
Enter the string : 0DinhNamHMMU:mainam231299
From Server : Congratulations. Successful login. Can I help you, please! Nguyen Dinh Nam, B15DCVT262.
Enter the string : 1B15DCVT262:Physic
From Server : Your full name: Nguyen Dinh Nam; Your student ID: B15DCVT262; Physic: 8 score.
Enter the string : 1B15DCVT262:All
From Server : Math: 7 score; Physic: 8 score; Chemistry: 9 score.
Enter the string : 2
From Server : You have logged out. Please log in to continue! [0Username:Password]
Enter the string : 1B15DCVT262:All
From Server : You are not logged in. Please log in to continue! [0Username:Password]
Enter the string : 
```

- Nếu muốn tiếp tục, Client 1 lại đăng nhập lại và gửi yêu cầu tới server như trên

Hình ảnh phía Client 1



```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x
client1 client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc client1.c -o client1
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./client1
Socket successfully created..
Connected to the server..
From Server : Hi, I'm a Server. Please log in to continue! [0Username:Password]
Enter the string : 0DinhNamHMMU:mainam231299
From Server : Congratulations. Successful login. Can I help you, please! Nguyen Dinh Nam, B15DCVT262.
Enter the string : 1B15DCVT262:Physic
From Server : Your full name: Nguyen Dinh Nam; Your student ID: B15DCVT262; Physic: 8 score.
Enter the string : 1B15DCVT262:All
From Server : Math: 7 score; Physic: 8 score; Chemistry: 9 score.
Enter the string : 2
From Server : You have logged out. Please log in to continue! [0Username:Password]
Enter the string : 1B15DCVT262:All
From Server : You are not logged in. Please log in to continue! [0Username:Password]
Enter the string : 0DinhNamHMMU:mainam231299
From Server : Congratulations. Successful login. Can I help you, please! Nguyen Dinh Nam, B15DCVT262.
Enter the string : 
```

- Hủy kết nối với Server

Hình ảnh phía Client 1

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc client1.c -o client1
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./client1
Socket successfully created..
Connected to the server..
From Server : Hi, I'm a Server. Please log in to continue! [0Username:Password]
Enter the string : 0DinhNamHMMU:mainam231299
From Server : Congratulations. Successful login. Can I help you, please! Nguyen Dinh Nam, B15DCVT262.
Enter the string : 1B15DCVT262:Physic
From Server : Your full name: Nguyen Dinh Nam; Your student ID: B15DCVT262; Physic: 8 score.
Enter the string : 1B15DCVT262:All
From Server : Math: 7 score; Physic: 8 score; Chemistry: 9 score.
Enter the string : 2
From Server : You havед logged out. Please log in to continue! [0Username:Password]
Enter the string : 1B15DCVT262:All
From Server : You are not logged in. Please log in to continue! [0Username:Password]
Enter the string : 0DinhNamHMMU:mainam231299
From Server : Congratulations. Successful login. Can I help you, please! Nguyen Dinh Nam, B15DCVT262.
Enter the string : exit
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$
```

Hình ảnh phía Server

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/Score... x
client1 client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc server.c -o server
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./server
Waiting for connections ...
New connection!
From Client: 0DinhNamHMMU:mainam231299
Username: DinhNamHMMU
Password: mainam231299
From Client: 1B15DCVT262:Physic
From Client: 1B15DCVT262:All
From Client: 2
From Client: 1B15DCVT262:All
From Client: 0DinhNamHMMU:mainam231299
Username: DinhNamHMMU
Password: mainam231299
From Client: exit
Host disconnected
```

4.2 Chạy Client 2

- Việc chạy Client 2 hoàn toàn tương tự như Client 1

4.3 Chạy đồng thời trên nhiều Thread

- Client 1 đăng nhập

Hình ảnh phía Client 1

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Dow... x dinhnam@dinhnam-MacBookPro: ~/Dow... x dinhnam@dinhnam-MacBookPro: ~/Dow... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1 client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc client1.c -o client1
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./client1
Socket successfully created..
Connected to the server..
From Server : Hi, I'm a Server. Please log in to continue! [0Username:Password]
Enter the string : 0DinhNamHMMU:mainam231299
From Server : Congratulations. Successful login. Can I help you, please! Nguyen Dinh Nam, B15DCVT262.
Enter the string : 
```

Hình ảnh phía Server

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Dow... x dinhnam@dinhnam-MacBookPro: ~/Dow... x dinhnam@dinhnam-MacBookPro: ~/Dow... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1 client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc server.c -o server
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./server
Waiting for connections ...
New connection!

From Client: 0DinhNamHMMU:mainam231299
Username: DinhNamHMMU
Password: mainam231299

```

- Client 2 đăng nhập

Hình ảnh phía Client 2

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Dow... x dinhnam@dinhnam-MacBookPro: ~/Dow... x dinhnam@dinhnam-MacBookPro: ~/Dow... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1 client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc client2.c -o client2
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./client2
Socket successfully created..
Connected to the server..
From Server : Hi, I'm a Server. Please log in to continue! [0Username:Password]
Enter the string : 0MaiMon:hongmai1993
From Server : Congratulations. Successful login. Can I help you, please! Nguyen Thi Hong Mai, D16DCVT267.
Enter the string : 
```

Hình ảnh phía Server

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Dow... x dinhnam@dinhnam-MacBookPro: ~/Dow... x dinhnam@dinhnam-MacBookPro: ~/Dow... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1 client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc server.c -o server
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./server
Waiting for connections ...
New connection!
From Client: 0DinhNamHMMU:mainam231299
Username: DinhNamHMMU
Password: mainam231299
New connection!
From Client: 0MaiMon:hongmai1993
Username: MaiMon
Password: hongmai1993

```

- Client 1 truy nhập thông tin và điểm số

Hình ảnh phía Client 1

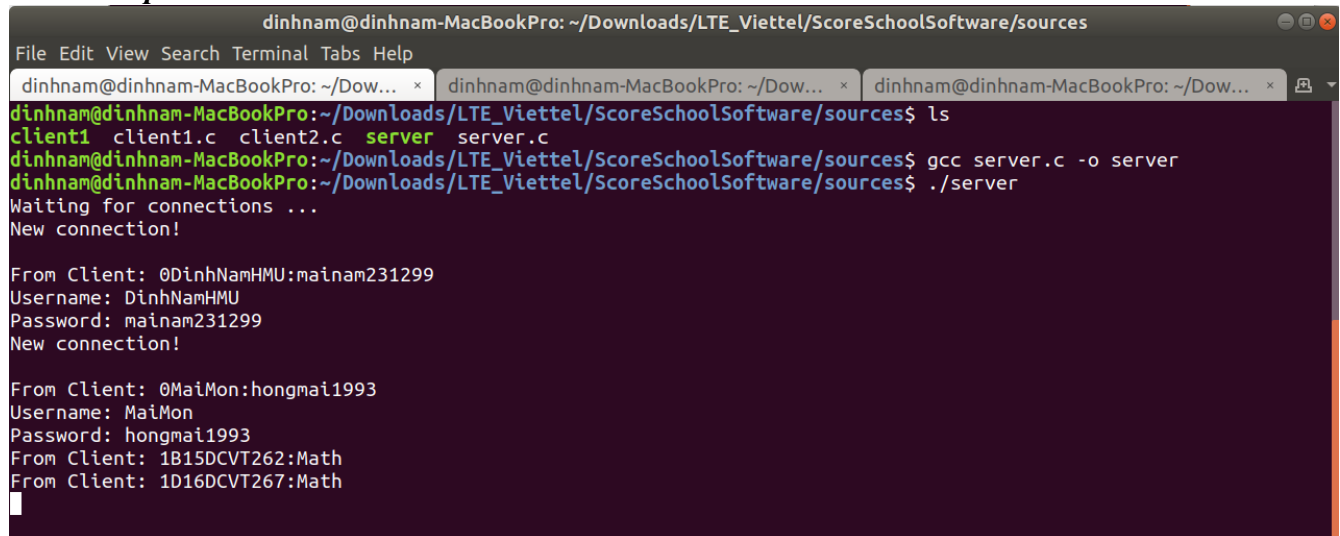
```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Dow... x dinhnam@dinhnam-MacBookPro: ~/Dow... x dinhnam@dinhnam-MacBookPro: ~/Dow... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1 client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc client1.c -o client1
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./client1
Socket successfully created..
Connected to the server..
From Server : Hi, I'm a Server. Please log in to continue! [0Username:Password]
Enter the string : 0DinhNamHMMU:mainam231299
From Server : Congratulations. Successful login. Can I help you, please! Nguyen Dinh Nam, B15DCVT262.
Enter the string : 1B15DCVT262:Math
From Server : Your full name: Nguyen Dinh Nam; Your student ID: B15DCVT262; Math: 7 score.
Enter the string : 
```

- Client 2 truy nhập thông tin và điểm số

Hình ảnh phía Client 2

```
dinhnam@dinhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhnam-MacBookPro: ~/Dow... x dinhnam@dinhnam-MacBookPro: ~/Dow... x dinhnam@dinhnam-MacBookPro: ~/Dow... x
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1 client1.c client2.c server server.c
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc client2.c -o client2
dinhnam@dinhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./client2
Socket successfully created..
Connected to the server..
From Server : Hi, I'm a Server. Please log in to continue! [0Username:Password]
Enter the string : 0MaiMon:hongmai1993
From Server : Congratulations. Successful login. Can I help you, please! Nguyen Thi Hong Mai, D16DCVT267.
Enter the string : 1D16DCVT267:Math
From Server : Your full name: Nguyen Thi Hong Mai; Your student ID: D16DCVT267; Math: 9 score.
Enter the string : 
```


Hình ảnh phía Server



```
dinhnam@dinhhnam-MacBookPro: ~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources
File Edit View Search Terminal Tabs Help
dinhnam@dinhhnam-MacBookPro: ~/Dow... x dinhnam@dinhhnam-MacBookPro: ~/Dow... x dinhnam@dinhhnam-MacBookPro: ~/Dow... x
dinhnam@dinhhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ls
client1 client1.c client2.c server server.c
dinhnam@dinhhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ gcc server.c -o server
dinhnam@dinhhnam-MacBookPro:~/Downloads/LTE_Viettel/ScoreSchoolSoftware/sources$ ./server
Waiting for connections ...
New connection!

From Client: 0DinhNamHMU:mainam231299
Username: DinhNamHMU
Password: mainam231299
New connection!

From Client: 0MaiMon:hongmai1993
Username: MaiMon
Password: hongmai1993
From Client: 1B15DCVT262:Math
From Client: 1D16DCVT267:Math
█
```

- Các thao tác khác tương tự như trên và được Client 1 và Client 2 truy vấn đồng thời tới Server.
- Không chỉ dừng lại ở 2 Client truy xuất yêu cầu tới Server. Phần mềm còn hỗ trợ nhiều hơn Client cùng làm việc đồng thời.

KẾT LUẬN

Phần mềm “Score School System ” đã đạt được các yêu cầu cơ bản của bài toán đặt ra. Đồng thời, có giao diện console khá đơn giản, thân thiện. Hy vọng trong tương lai, chúng tôi có thể phát triển phần mềm với nhiều chức năng hơn, hoàn thiện hơn nữa. Xin chân thành cảm ơn!

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