

# Computer Networks Programming Assignment 操作說明

圖資五 b05106010 黃冠文

- 執行環境：Ubuntu 20.04.1 LTS
- 程式語言：C++
- 作業處理邏輯說明：
  1. include 所需 libraries (共使用六個)：<stdio.h>、<stdlib.h>、<sys/socket.h>、<string.h>、<arpa/inet.h>、<unistd.h>
  2. 先建立一個要跟 server 建立連線的 socket：

```
8 int main(int argc , char *argv[])
9 {
10     int socket_desc;
11     struct sockaddr_in server;
12     bzero(&server, sizeof(server)); //initiation
13     char server_reply[2000];
14
15     //create socket
16     socket_desc = socket(AF_INET , SOCK_STREAM , 0);
17     if (socket_desc == -1)
18     {
19         printf("Could not create socket");
20     }
```

3. 接著分別以 port\_num 以及 server\_ip 存取 server 端的 port number 還有 server 的 ip：

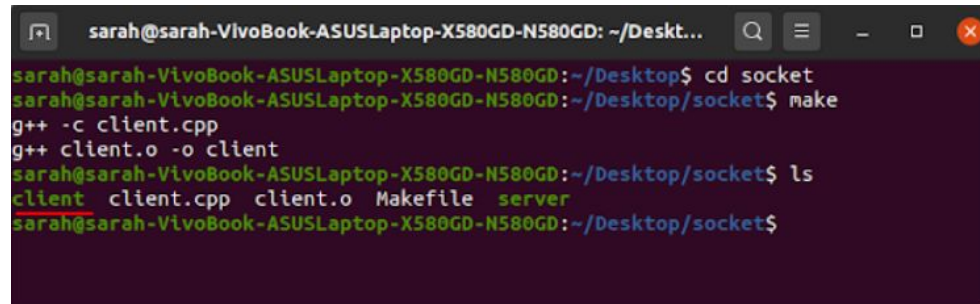
```
22 //inputs
23 int port_num;
24 char server_ip[20];
25 printf("_____\\nWelcome!\\nWhich server do you want to connect?\\n\\nIP address: ");
26 scanf("%s", server_ip);
27 printf("Port number: ");
28 scanf("%d", &port_num);
29 printf("_____\\n");
30
31 server.sin_addr.s_addr = inet_addr(server_ip);
32 server.sin_family = AF_INET;
33 server.sin_port = htons(port_num);
34
35 //connect to remote server
36 if(connect(socket_desc, (struct sockaddr*)&server, sizeof(server)) < 0){
37     puts("connect error");
38     return 1;
39 }
40
41 //receive a reply from the server
42 if(recv(socket_desc, server_reply, 2000, 0) < 0){
43     puts("receive failed");
44 }
45
46 puts(server_reply);
47 memset(&server_reply[0], 0, sizeof(server_reply));
```

4. 最後的部份便是 client 從 server 註冊、登入、查看清單以及離開的功能：

```
56 //Send some data
57 if( send(socket_desc , message , strlen(message) , 0) < 0)
58 {
59     puts("send failed");
60     return 1;
61 }
62
63 //Receive a reply from the server
64 if( recv(socket_desc, server_reply , 500 , 0) < 0)
65 {
66     puts("recv failed");
67 }
68 puts(server_reply);
69 memset(&server_reply[0], 0, sizeof(server_reply));
70 }
71
72 close(socket_desc);
73 return 0;
74 }
```

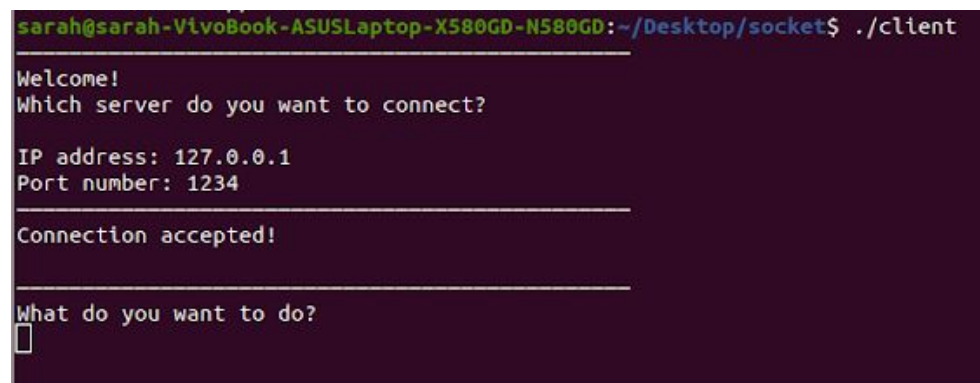
- 關於程式編譯與執行：

1. 將client.cpp以及Makefile放在同個資料夾，打開terminal並定位至該資料夾後，輸入make即可編譯程式：



```
sarah@sarah-VivoBook-ASUSLaptop-X580GD-N580GD: ~/Desk...
sarah@sarah-VivoBook-ASUSLaptop-X580GD-N580GD:~/Desktop$ cd socket
sarah@sarah-VivoBook-ASUSLaptop-X580GD-N580GD:~/Desktop/socket$ make
g++ -c client.cpp
g++ client.o -o client
sarah@sarah-VivoBook-ASUSLaptop-X580GD-N580GD:~/Desktop/socket$ ls
client client.cpp client.o Makefile server
sarah@sarah-VivoBook-ASUSLaptop-X580GD-N580GD:~/Desktop/socket$
```

2. client 即為程式執行檔，輸入 server 的 port number 和 ip 後即可得知是否成功連線：



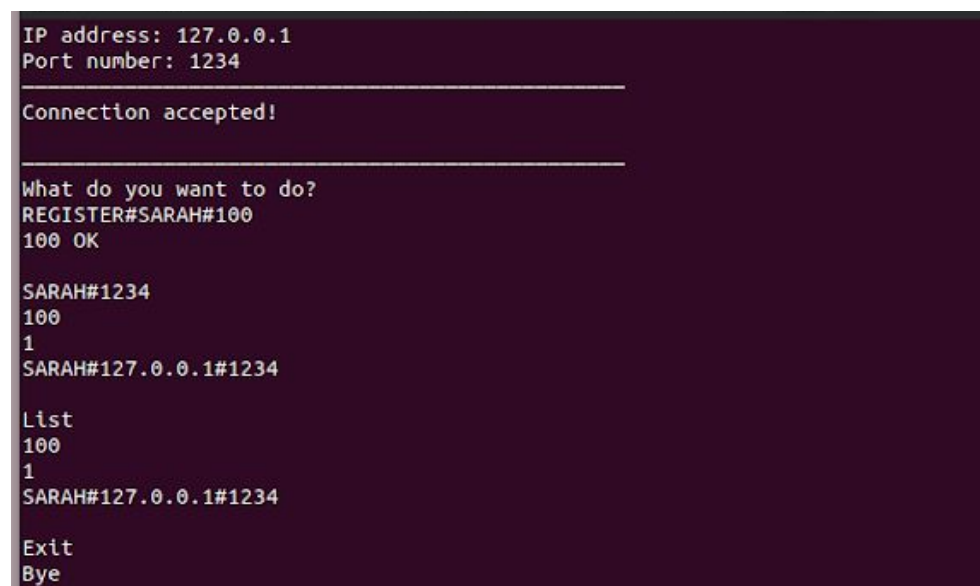
```
sarah@sarah-VivoBook-ASUSLaptop-X580GD-N580GD:~/Desktop/socket$ ./client
Welcome!
Which server do you want to connect?

IP address: 127.0.0.1
Port number: 1234

Connection accepted!

What do you want to do?
█
```

3. 成功連線後即可嘗試各項功能：



```
IP address: 127.0.0.1
Port number: 1234

Connection accepted!

What do you want to do?
REGISTER#SARAH#100
100 OK

SARAH#1234
100
1
SARAH#127.0.0.1#1234

List
100
1
SARAH#127.0.0.1#1234

Exit
Bye
```