DEPARTMENT OF COMPUTER & SOFTWARE ENGINEERING

COLLEGE OF E&ME, NUST, RAWALPINDI

Microprocessor and Microcontroller Based Design

Lab 01

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Submission Date: 24/10/2022

Tasks:
CODE:
SERVER.CPP

```cpp
#include <iostream>
#include <string.h>

#include <sys/socket.h>
#include <netinet/in.h>

#define SERVER_PORT_NO 80

using namespace std;

int main() {

    int fd = socket(AF_INET, SOCK_STREAM, 0);
    if (fd == -1) {
        perror("Socket Creation failed\n");
        return -1;
    }


    struct sockaddr_in addr;

    addr.sin_addr.s_addr    = INADDR_ANY;
    addr.sin_family = AF_INET;
    addr.sin_port        = htons(SERVER_PORT_NO);

    if (bind(fd, (struct sockaddr*) &addr, sizeof(addr)) == -1) {
        perror("Bind failed on socket\n");
        return -1;
    }


    int backlog = 10;
    if (listen(fd, backlog) == -1) {
        perror("Listen Failed on server: \n");
        return -1;
    }


    int connfd;
    struct sockaddr_in cliaddr;
    socklen_t cliaddr_len;
    connfd = accept(fd, (struct sockaddr *) &cliaddr, &cliaddr_len);
```

```cpp
    if (connfd <=0 ) {
        perror("accept failed on socket: ");
    }

    string send_data = "";
    char buffer[100];


    while(send_data != "1"){
        // Recieve Data From Client
        bzero(buffer, 100);
        recv(connfd, buffer, 100, 0);

        int len_in_data = strlen(buffer);
        send_data = "";
        for(int i = 0; i < len_in_data; i++){
            send_data += buffer[i];
        }
        if(send_data == "1"){
            cout << "Client left !!!\n";
            break;
        }

        cout<<"Client: "<< buffer << endl;
        cout << "Me:      ";

        // Return Msg
        getline(cin,send_data);

        // Check length
        int len = send_data.length();
        // Convert string to char
        char buff[len +1];
        strcpy(buff, send_data.c_str());
        // Send data
        send(connfd, buff, strlen(buff), 0);

        if(send_data == "1"){
            break;
        }

    }
    cout<<"Server Exiting!\n";
```

```cpp
        shutdown(fd,SHUT_WR);
        shutdown(connfd,SHUT_RDWR);
        return 0;
}
```

CLIENT.CPP

```cpp
#include <string.h>
#include <iostream>

#include <sys/socket.h>
#include <netinet/in.h>
#include <arpa/inet.h>

#define SERVER_PORT_NO 80

using namespace std;

int main() {

    int fd = socket(AF_INET, SOCK_STREAM, 0);
    if (fd == -1) {
        perror("Socket Creation failed\n");
        return -1;
    }


    struct sockaddr_in s_addr;

    s_addr.sin_family   = AF_INET;
    s_addr.sin_port = htons(80);
    inet_aton("127.0.0.1", &s_addr.sin_addr);
    if (connect(fd, (struct sockaddr *) &s_addr, sizeof(s_addr)) == -1) {
        perror("Socket Connect failed\n");
        return -1;
    }

    string send_data;
    char buff[100];
    int len_income_data;
    while(send_data != "1")
    {
        // Send data to Server
        cout << "Me:      ";
```

```cpp
        // Take Input from User
        getline(cin, send_data);

        // Convert String to char data type
        int n = send_data.length();
        char buffer[ n + 1];
        strcpy(buffer, send_data.c_str());

        // Now send to server
        send(fd, buffer, strlen(buffer), 0);

        // Check if you want to break loop
        if(send_data == "1"){
            break;
        }

        // Start recieving data;
        bzero(buff, 100);
        recv(fd, buff, 100, 0);

        send_data = "";
        // Check length of characters
        len_income_data = strlen(buff);

        // Store in String
        for (int i = 0; i < len_income_data; i++)
        {
            send_data += buff[i];
        }
        // Check if server left or not
        if(send_data == "1")
        {
            cout << "Server left!!! \n";
            break;
        }

        // Display server msg
        cout << "Server: " << buff << endl;
    }
    cout<<"Client Exiting!"<<endl;
    shutdown(fd,SHUT_RDWR);
    return 0;
}
```

OUTPUT:

```
Message Sent
Message Sent
Message Sent
Message Sent
M  Files  e Sent
Message Sent
Message Sent
Message Sent
Hello, This is a Sample Message from Client
age from Client
o, This is a Sample Message from Client
from Client
his is a Sample Message from Client
 Client
is a Sample Message from Client
ent
 Sample Message from Client
ple Message from Client
Message Sent
Message Sent
Message Sent
Message Sent
Message Sent
Message Sent
Message Sent
Message Sent
Message Sent
```

```
 Sample Message from Server
ple Message from Server
Message from Server
Hello, This is a Sample Message from Server
age from Server
o, This is a Sample Message from Server
from Server
his is a Sample Message from Server
 Server
is a Sample Message from Server
ver
 Sample Message from Server
ple Message from Server
Message Sent


 Sent
Message Sent


 Sent
Message Sent


 Sent
```