

## Q. TCP server-client implementation in c.

tcp\_serv.c

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <arpa/inet.h>

int main(){

    char *ip = "127.0.0.1";
    int port = 4995;

    int server_sock, client_sock;
    struct sockaddr_in server_addr, client_addr;
    socklen_t addr_size;
    char buffer[1024];
    int n;

    server_sock = socket(AF_INET, SOCK_STREAM, 0);
    if(server_sock < 0){
        perror("[-]socket Error");
        exit(1);
    }

    printf("[+]TCP Server Socket Created.\n");

    memset(&server_addr, '0', sizeof(server_addr));
    server_addr.sin_family = AF_INET;
    server_addr.sin_port = port;
    server_addr.sin_addr.s_addr = inet_addr(ip);

    n = bind(server_sock, (struct sockaddr*)&server_addr, sizeof(server_addr));
    if(n < 0){
        perror("[-]Bind Error");
        exit(1);
    }
    printf("[+]Bind to the Port Number: %d\n", port);

    listen(server_sock, 5);
    printf("Listening...\n");

    while(1){
        client_sock = accept(server_sock, (struct sockaddr*)&client_addr, &addr_size);
        printf("[+]Client Connected.%d\n", client_sock);

        bzero(buffer, 1024);
```

```

recv(client_sock, buffer, sizeof(buffer), 0);
printf("Client: %s\n",buffer);

bzero(buffer, 1024);
strcpy(buffer, "HI!.. THIS IS THE SERVER.");
printf("Server: %s\n",buffer);
send(client_sock, buffer, strlen(buffer), 0);

close(client_sock);
printf("[+]Client Disconnected.\n\n");
}

return 0;
}

```

tcp\_cli.c

```

#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <arpa/inet.h>

int main(){

    char *ip = "127.0.0.1";
    int port = 4995;
    int sock;
    struct sockaddr_in addr;
    socklen_t addr_size;
    char buffer[1024];
    int n;

    sock = socket(AF_INET, SOCK_STREAM, 0);
    if(sock < 0){
        perror("[-]socket Error");
        exit(1);
    }

    printf("[+]TCP Server Socket Created.\n");

    memset(&addr, '0', sizeof(addr));
    addr.sin_family = AF_INET;
    addr.sin_port = port;
    addr.sin_addr.s_addr = inet_addr(ip);

    connect(sock, (struct sockaddr*)&addr, sizeof(addr));

```

```
printf("CONNECTED TO THE SERVER\n");

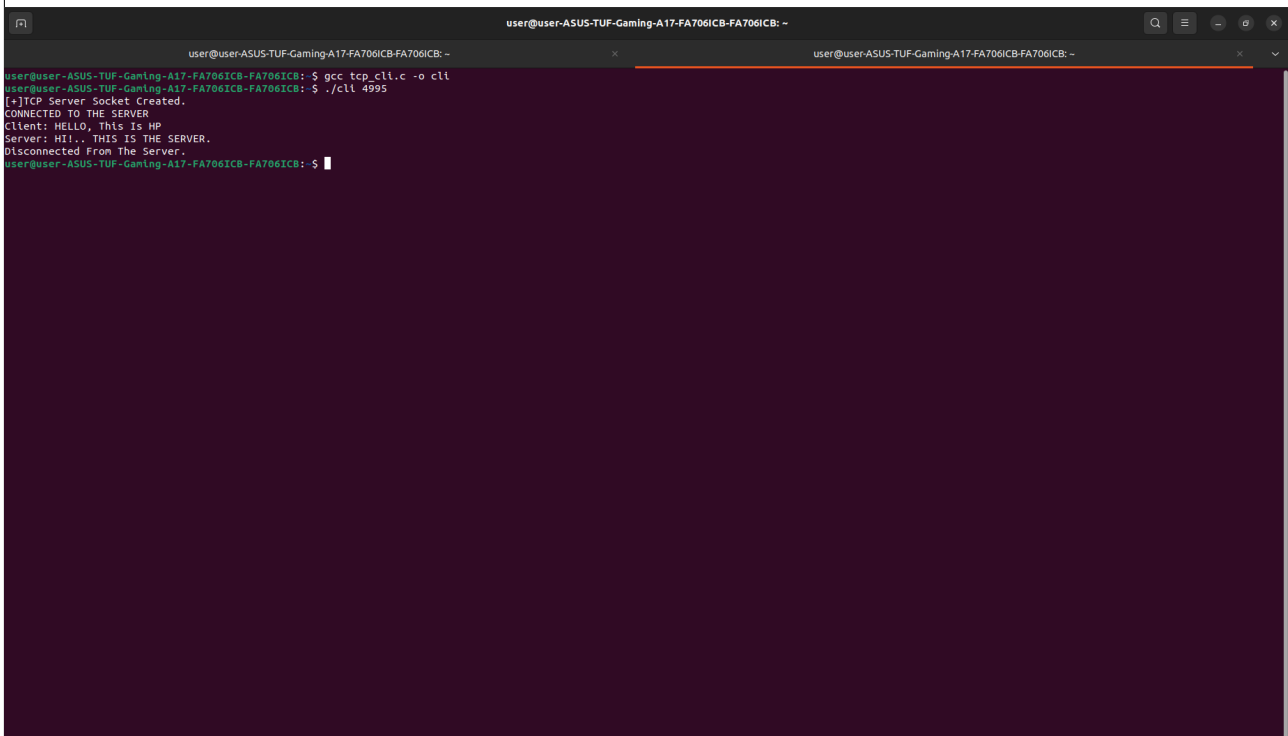
bzero(buffer, 1024);
strcpy(buffer, "HELLO, This Is HP");
printf("Client: %s\n",buffer);
send(sock, buffer, strlen(buffer), 0);

bzero(buffer, 1024);
recv(sock, buffer, sizeof(buffer), 0);
printf("Server: %s\n",buffer);

close(sock);
printf("Disconnected From The Server.\n");

return 0;
}
```

OUTPUT:-



```
user@user-ASUS-TUF-Gaming-A17-FA706ICB-FA706ICB: ~
user@user-ASUS-TUF-Gaming-A17-FA706ICB-FA706ICB: ~
user@user-ASUS-TUF-Gaming-A17-FA706ICB-FA706ICB: $ gcc tcp_cli.c -o cli
user@user-ASUS-TUF-Gaming-A17-FA706ICB-FA706ICB: $ ./cli 4995
[+]TCP Server Socket Created.
CONNECTED TO THE SERVER
Client: HELLO, This Is HP
Server: HI!.. THIS IS THE SERVER.
Disconnected From The Server.
user@user-ASUS-TUF-Gaming-A17-FA706ICB-FA706ICB: $
```

```
user@user-ASUS-TUF-Gaming-A17-FA706ICB-FA706ICB: ~  
user@user-ASUS-TUF-Gaming-A17-FA706ICB-FA706ICB: $ gcc tcp_serv.c -o serv  
user@user-ASUS-TUF-Gaming-A17-FA706ICB-FA706ICB: $ ./serv 4995  
[+]TCP Server Socket Created.  
[+]Bind to the Port Number: 4995  
Listening...  
[+]client connected.4  
Client: HELLO, This Is HP  
Server: HI!.. THIS IS THE SERVER.  
[-]Client Disconnected.
```

Q. TCP server-client mathematical expression solved .  
tcpserv.c

```
#include <stdio.h>  
#include <stdlib.h>  
#include <string.h>  
#include <unistd.h>  
#include <sys/types.h>  
#include <sys/socket.h>  
#include <netinet/in.h>  
#include <arpa/inet.h>  
int term();  
int mukdiv();  
int addsub();  
char buffer[1024];  
int pos=0;  
void toString(int num)  
{  
int t,rem,len=0,g;  
g=num;  
while(g!=0)  
{  
len++;  
g/=10;  
}  
for(t=0;t<len;t++)  
{  
rem=num%10;  
num=num/10;  
buffer[len-(t+1)]=rem+'0';
```

```

}
buffer[len]='\0';
}
int term()
{
int n=0;

if(buffer[pos]=='(')
{
pos++;
n=addsub();
if(buffer[pos]==')')
{
pos++;
return n;
}
}
else
{
while('0'<=buffer[pos] && buffer[pos]<='9'){
n=n*10+(buffer[pos] - '0');
pos++;
}
}
return n;

}
int muldiv()
{
int first,second;
first=term();
for(;;)
{
if(buffer[pos]=='*')
{
pos++;
second=term();
first=first*second;
}
else if(buffer[pos]=='/')
{
pos++;
second=term();
first=first/second;
}
else
{
return first;
}
}
}

```

```

int addsub()
{
int first,second;
first=muldiv();
for(;;)
{
if(buffer[pos]=='+')
{
pos++;
second=muldiv();
first=first+second;
}
else if(buffer[pos]=='-')
{
pos++;
second=muldiv();
first=first-second;
}
else
{
return first;
}
}
}
int main(){

    char *ip = "127.0.0.1";
    int port = 4995;

    int server_sock, client_sock;
    struct sockaddr_in server_addr, client_addr;
    socklen_t addr_size;
    //char buffer[1024];
    int n;

    server_sock = socket(AF_INET, SOCK_STREAM, 0);
    if(server_sock < 0){
        perror("[-]socket Error");
        exit(1);
    }

    printf("[+]TCP Server Socket Created.\n");

    memset(&server_addr, '0', sizeof(server_addr));
    server_addr.sin_family = AF_INET;
    server_addr.sin_port = port;
    server_addr.sin_addr.s_addr = inet_addr(ip);

    n = bind(server_sock, (struct sockaddr*)&server_addr, sizeof(server_addr));
    if(n < 0){
        perror("[-]Bind Error");
        exit(1);
    }

```

```

    }
    printf("[+]Bind to the Port Number: %d\n", port);

    listen(server_sock, 5);
    printf("Listening...\n");

    while(1){
        client_sock = accept(server_sock, (struct sockaddr*)&client_addr, &addr_size);
        printf("[+]Client Connected.%d\n",client_sock);

        bzero(buffer, 1024);
        recv(client_sock, buffer, sizeof(buffer), 0);
        printf("Client: %s\n",buffer);
        int res=addsub();
        printf("Server: %d\n",res);

        bzero(buffer, 1024);
        tostring(res);
        //strcpy(buffer, "HI!.. THIS IS THE SERVER.");
        printf("Server: %s\n",buffer);
        send(client_sock, buffer, strlen(buffer), 0);

        close(client_sock);
        printf("[-]Client Disconnected.\n\n");
    }

    return 0;
}

```

tcpcli.c

```

#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include<arpa/inet.h>

int main(){

    char *ip = "127.0.0.1";
    int port = 4995;
    int sock;
    struct sockaddr_in addr;
    socklen_t addr_size;
    char buffer[1024];
    int n;

```

```

sock = socket(AF_INET, SOCK_STREAM, 0);
if(sock < 0){
    perror("[-]socket Error");
    exit(1);
}

printf("[+]TCP Server Socket Created.\n");

memset(&addr, '0', sizeof(addr));
addr.sin_family = AF_INET;
addr.sin_port = port;
addr.sin_addr.s_addr = inet_addr(ip);

connect(sock, (struct sockaddr*)&addr, sizeof(addr));
printf("CONNECTED TO THE SERVER\n");

bzero(buffer, 1024);
strcpy(buffer, "9+6+(5*2)-5");
printf("Client: %s\n",buffer);
send(sock, buffer, strlen(buffer), 0);

bzero(buffer, 1024);
recv(sock, buffer, sizeof(buffer), 0);
printf("Server: %s\n",buffer);

close(sock);
printf("Disconnected From The Server.\n");

return 0;
}

```

OUTPUT:-



```
user@user-ASUS-TUF-Gaming-A17-FA706ICB-FA706ICB: ~  
user@user-ASUS-TUF-Gaming-A17-FA706ICB-FA706ICB: ~  
user@user-ASUS-TUF-Gaming-A17-FA706ICB-FA706ICB: $ gcc tcpcli.c -o cli  
user@user-ASUS-TUF-Gaming-A17-FA706ICB-FA706ICB: $ ./cli 4995  
[+]TCP Server Socket Created.  
CONNECTED TO THE SERVER  
Client: 9+6*(5*2)-5  
Server: 20  
Disconnected From The Server.  
user@user-ASUS-TUF-Gaming-A17-FA706ICB-FA706ICB: $
```

```
user@user-ASUS-TUF-Gaming-A17-FA706ICB-FA706ICB: ~  
user@user-ASUS-TUF-Gaming-A17-FA706ICB-FA706ICB: ~  
user@user-ASUS-TUF-Gaming-A17-FA706ICB-FA706ICB: $ gcc tcpserv.c -o serv  
user@user-ASUS-TUF-Gaming-A17-FA706ICB-FA706ICB: $ ./serv 4995  
[+]TCP Server Socket Created.  
[+]Bind to the Port Number: 4995  
Listening...  
[+]Client Connected.  
Client: 9+6*(5*2)-5  
Server: 20  
Server: 20  
[-]Client Disconnected.
```