

## CONNECTING MULTIPLE CLIENTS WITH A SINGLE SERVER USING SOCKETS TO PERFORM ARITHMETIC OPERATIONS

### SERVER.C

```
1  #include <stdio.h>
2  #include <stdlib.h>
3  #include <sys/types.h>
4  #include <sys/socket.h>
5  #include <netinet/in.h>
6  #include <unistd.h>
7  #include <string.h>
8  #include <time.h>
9
10 int main() {
11     int server_socket;
12     server_socket = socket(AF_INET, SOCK_STREAM, 0);
13     struct sockaddr_in server_address;
14     server_address.sin_family = AF_INET;
15     server_address.sin_port = htons(8389);
16     server_address.sin_addr.s_addr = INADDR_ANY;
17     bind(server_socket, (struct sockaddr *) &server_address, sizeof(server_address));
18     listen(server_socket, 3);
19     int client_socket, client_ind = 1;
20     struct sockaddr_in newAddr;
21     pid_t cp;
22     while(1) {
23         client_socket = accept(server_socket, NULL, NULL);
24         if(client_socket < 0) {
25             exit(0);
26         }
27         time_t t;
28         time(&t);
29         printf("Socket Connection Established with Client %d on %s \n", client_ind, ctime(&t));
30         cp = fork();
31         if(cp == 0) {
32             int a, b, mul, add, div, sub;
33             close(server_socket);
34
35             read(client_socket, &a, sizeof(a));
36             read(client_socket, &b, sizeof(b));
37
38             add = a+b;
39             sub = a-b;
40             mul = a*b;
41             div = a/b;
42
43             printf("The Result of Arithmetic Operations for Client %d are : \n", client_ind);
44             printf("Addition : %d \n", add);
45             printf("Subtraction : %d \n", sub);
46             printf("Multiplication : %d \n", mul);
47             printf("Division : %d \n", div);
48
49             printf("\n");
50             write(client_socket, &add, sizeof(add));
51             write(client_socket, &sub, sizeof(sub));
52             write(client_socket, &mul, sizeof(mul));
53             write(client_socket, &div, sizeof(div));
54         }
55         client_ind++;
56     }
57     return 0;
58 }
```

## CLIENT.C

```
1  #include <stdio.h>
2  #include <stdlib.h>
3  #include <sys/types.h>
4  #include <sys/socket.h>
5  #include <netinet/in.h>
6  #include <unistd.h>
7  #include <string.h>
8  #include <time.h>
9
10 int main() {
11     int client_socket;
12     client_socket = socket(AF_INET, SOCK_STREAM, 0);
13     char buffer[256];
14     struct sockaddr_in server_address;
15     server_address.sin_family = AF_INET;
16     server_address.sin_port = htons(8389);
17     server_address.sin_addr.s_addr = INADDR_ANY;
18     int conn_status = connect(client_socket, (struct sockaddr *) &server_address, sizeof(server_address));
19     if(conn_status == -1) {
20         printf("Socket Connection Failed\n");
21         exit(0);
22     }
23     else {
24         time_t t;
25         time(&t);
26         printf("Socket Connection Established on %s \n", ctime(&t));
27     }
28     int a,b;
29     printf("Enter any 2 numbers \n");
30     scanf("%d",&a);
31     scanf("%d",&b);
32
33     write(client_socket,&a,sizeof(a));
34     write(client_socket,&b,sizeof(b));
35
36     int add,sub,div,mul;
37     read(client_socket,&add,sizeof(add));
38     read(client_socket,&sub,sizeof(sub));
39     read(client_socket,&mul,sizeof(mul));
40     read(client_socket,&div,sizeof(div));
41
42     printf("The Result from the Server is : \n");
43     printf("Addition : %d\n",add);
44     printf("Subtraction : %d\n",sub);
45     printf("Division : %d\n",div);
46     printf("Multiplication : %d \n",mul);
47
48     close(client_socket);
49
50     return 0;
51 }
```

## OUTPUT

### CLIENT 1 :-

```
[s2019103573@centos8-linux Wed Sep 22 07:02 PM spot]$ ./client
Socket Connection Established on Wed Sep 22 19:02:14 2021

Enter any 2 numbers
10
5
The Result from the Server is :
Addition : 15
Subtraction : 5
Division : 2
Multiplication : 50
[s2019103573@centos8-linux Wed Sep 22 07:03 PM spot]$
```

### CLIENT 2 :-

```
[s2019103573@centos8-linux Wed Sep 22 07:02 PM spot]$ ./client
Socket Connection Established on Wed Sep 22 19:02:27 2021

Enter any 2 numbers
176
40
The Result from the Server is :
Addition : 216
Subtraction : 136
Division : 4
Multiplication : 7040
[s2019103573@centos8-linux Wed Sep 22 07:04 PM spot]$
```

### CLIENT 3 :-

```
[s2019103573@centos8-linux Wed Sep 22 07:02 PM spot]$ ./client
Socket Connection Established on Wed Sep 22 19:02:42 2021

Enter any 2 numbers
38
4
The Result from the Server is :
Addition : 42
Subtraction : 34
Division : 9
Multiplication : 152
[s2019103573@centos8-linux Wed Sep 22 07:03 PM spot]$
```

## SERVER :-

```
[s2019103573@centos8-linux Wed Sep 22 07:01 PM spot]$ ./server
Socket Connection Established with Client 1 on Wed Sep 22 19:02:14 2021

Socket Connection Established with Client 2 on Wed Sep 22 19:02:27 2021

Socket Connection Established with Client 3 on Wed Sep 22 19:02:42 2021

The Result of Arithmetic Operations for Client 1 are :
Addition : 15
Subtraction : 5
Multiplication : 50
Division : 2

The Result of Arithmetic Operations for Client 3 are :
Addition : 42
Subtraction : 34
Multiplication : 152
Division : 9

The Result of Arithmetic Operations for Client 2 are :
Addition : 216
Subtraction : 136
Multiplication : 7040
Division : 4
```