Ex7-Full Duplex Communication Using TCP/IP

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SERVER CODE:

```
#include <sys/types.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <arpa/inet.h>
#include <netdb.h>
#include <stdio.h>
#include <unistd.h>
#include <strings.h>
#include <string.h>
#define MAX_MSG 100
#define SERVER_ADDR "127.0.0.1"
#define SERVER_PORT 3786


 main ( ) {

  int sd, newSd, cliLen, n,num1,num2,sum;

  struct sockaddr_in cliAddr, servAddr;
```

```
char line[MAX_MSG],line1[MAX_MSG],line2[MAX_MSG];
bzero((char *)&servAddr, sizeof(servAddr));
servAddr.sin_family = AF_INET;
servAddr.sin_addr.s_addr = inet_addr(SERVER_ADDR);
servAddr.sin_port = htons(SERVER_PORT);
sd = socket(AF_INET, SOCK_STREAM, 0);
printf("successfully created stream socket \n");
bind(sd, (struct sockaddr *) &servAddr, sizeof(servAddr));
printf("bound local port successfully\n");
listen(sd,5);


while(1) {

 printf("waiting for client connection on port TCP %u\n",SERVER_PORT);
 cliLen = sizeof(cliAddr);
 newSd = accept(sd, (struct sockaddr *) &cliAddr, &cliLen);

 printf("received connection from host [IP %s ,TCP port %d]\n",
        inet_ntoa(cliAddr.sin_addr), ntohs(cliAddr.sin_port));
 do{
  memset(line,0x0,MAX_MSG);
```

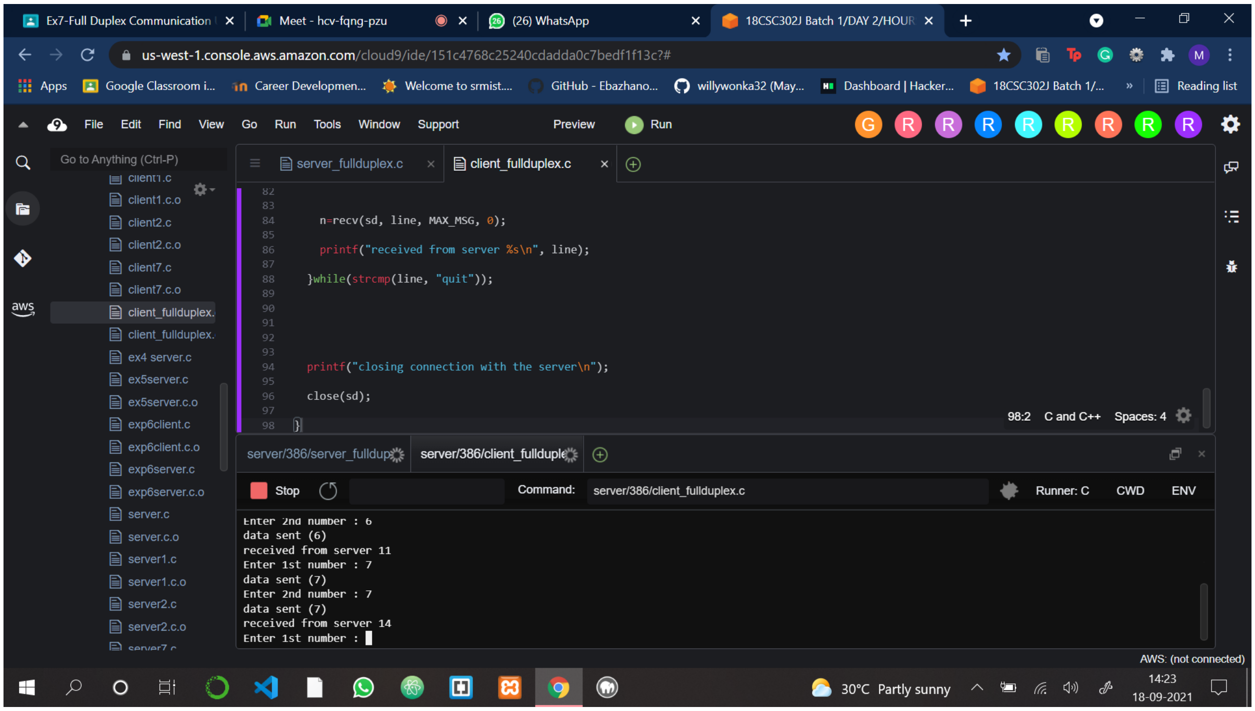
```
    n=recv(newSd, line, MAX_MSG, 0);
    num1=atoi(line);

    n=recv(newSd, line, MAX_MSG, 0);
    num2=atoi(line);


    sum=num1+num2;

    sprintf(line1,"%d",sum);


    printf("received from host [IP %s ,TCP port %d] : %s\n",
               inet_ntoa(cliAddr.sin_addr), ntohs(cliAddr.sin_port), line1);
send(newSd, line1, strlen(line1) + 1, 0);

  }while(abs(strcmp(line, "quit")));
  printf("closing connection with host [IP %s ,TCP port %d]\n",
               inet_ntoa(cliAddr.sin_addr), ntohs(cliAddr.sin_port));

  close(newSd);
  }
}
```

CLIENT CODE:

```
#include <sys/types.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <arpa/inet.h>
#include <netdb.h>
#include <stdio.h>
#include <unistd.h>
#include <string.h>
#include <strings.h>
#define MAX_MSG 100
#define SERVER_ADDR "127.0.0.1"
#define CLIENT_ADDR "127.0.0.1"
#define SERVER_PORT 3786
#define CLIENT_PORT 8229
 main () {
  int sd, rc, i,n;
  struct sockaddr_in clientAddr, servAddr;
  char line[MAX_MSG];
  bzero((char *)&servAddr, sizeof(servAddr));
```

```
servAddr.sin_family = AF_INET;

servAddr.sin_addr.s_addr = inet_addr(SERVER_ADDR);

servAddr.sin_port = htons(SERVER_PORT);
bzero((char *)&clientAddr, sizeof(clientAddr));

clientAddr.sin_family = AF_INET;

clientAddr.sin_addr.s_addr = INADDR_ANY;

clientAddr.sin_port = htons(0);

sd = socket(AF_INET, SOCK_STREAM, 0);

printf("successfully created stream socket \n");
bind(sd, (struct sockaddr *) &clientAddr, sizeof(clientAddr));

printf("bound local port successfully\n");
connect(sd, (struct sockaddr *) &servAddr, sizeof(servAddr));

printf("connected to server successfully\n");

do{

  printf("Enter 1st number : ");

  scanf("%s", line);



  send(sd, line, strlen(line) + 1, 0);

  printf("data sent (%s)\n", line);

  printf("Enter 2nd number : ");

  scanf("%s", line);

  send(sd, line, strlen(line) + 1, 0);

  printf("data sent (%s)\n", line);
  n=recv(sd, line, MAX_MSG, 0);

  printf("received from server %s\n", line);

 }while(strcmp(line, "quit"));




 printf("closing connection with the server\n");

 close(sd);

}
```

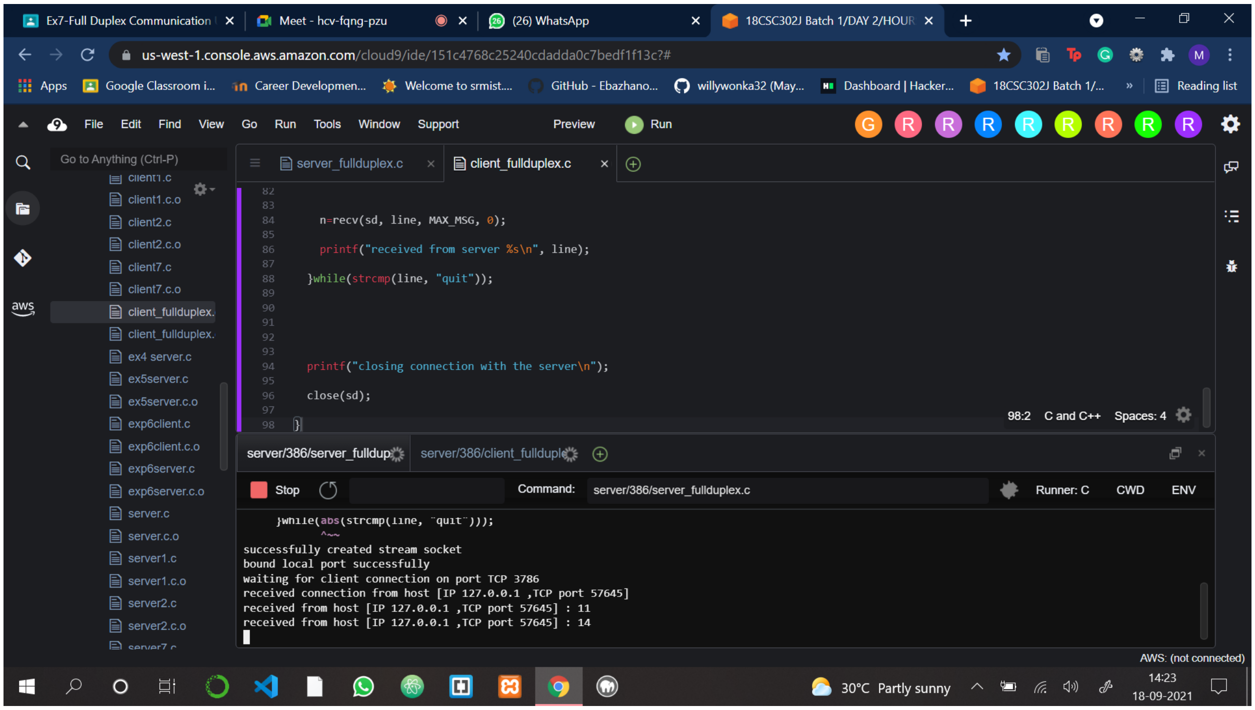
<u>OUTPUT:</u>



```
  n=recv(sd, line, MAX_MSG, 0);

  printf("received from server %s\n", line);

 }while(strcmp(line, "quit"));




 printf("closing connection with the server\n");

 close(sd);

}
```

Command: server/386/client_fullduplex.c

```
Enter 2nd number : 6
data sent (6)
received from server 11
Enter 1st number : 7
data sent (7)
Enter 2nd number : 7
data sent (7)
received from server 14
Enter 1st number :
```



```
    n=recv(sd, line, MAX_MSG, 0);

    printf("received from server %s\n", line);

  }while(strcmp(line, "quit"));




  printf("closing connection with the server\n");

  close(sd);

}
```

Command: server/386/server_fullduplex.c

```
     }while(abs(strcmp(line, "quit")));
               ^~~
successfully created stream socket
bound local port successfully
waiting for client connection on port TCP 3786
received connection from host [IP 127.0.0.1 ,TCP port 57645]
received from host [IP 127.0.0.1 ,TCP port 57645] : 11
received from host [IP 127.0.0.1 ,TCP port 57645] : 14
```