RA1811031010010
Experiment 6
Computer Networks

Half Duplex

Server Code

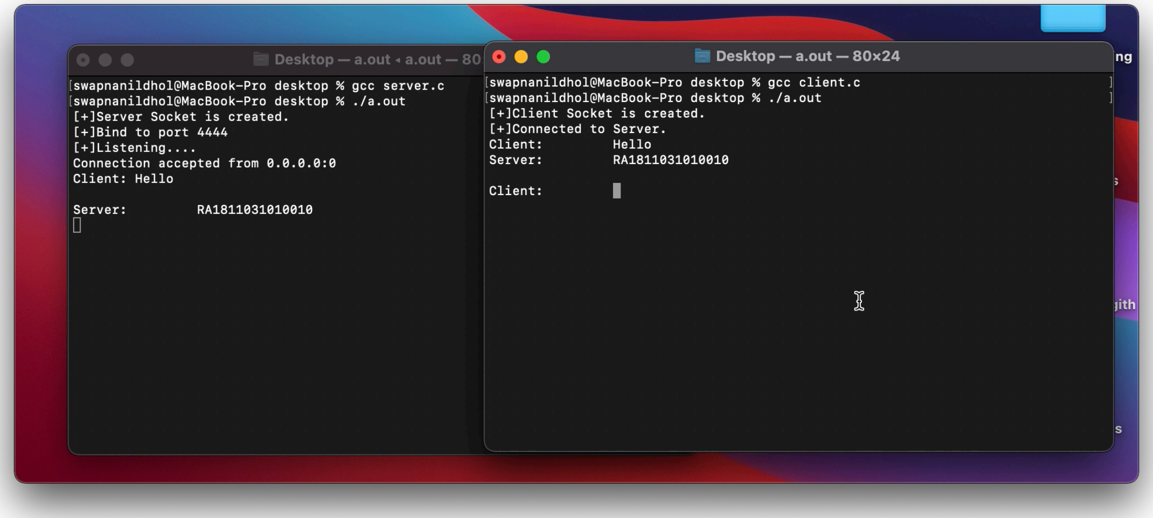
```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <sys/socket.h>
#include <sys/types.h>
#include <netinet/in.h>
#include <arpa/inet.h>

#define PORT 4444

int main(){
    char msg[1024];

    int sockfd, ret;
     struct sockaddr_in serverAddr;

    int newSocket;
    struct sockaddr_in newAddr;

    socklen_t addr_size;

    char buffer[1024];
    pid_t childpid;

    sockfd = socket(AF_INET, SOCK_STREAM, 0);
    if(sockfd < 0){
        printf("[-]Error in connection.\n");
        exit(1);
    }
    printf("[+]Server Socket is created.\n");

    memset(&serverAddr, '\0', sizeof(serverAddr));
    serverAddr.sin_family = AF_INET;
    serverAddr.sin_port = htons(PORT);
    serverAddr.sin_addr.s_addr = inet_addr("127.0.0.1");

    ret = bind(sockfd, (struct sockaddr*)&serverAddr, sizeof(serverAddr));
    if(ret < 0){
        printf("[-]Error in binding.\n");
        exit(1);
    }
    printf("[+]Bind to port %d\n", 4444);
    if(listen(sockfd, 10) == 0){
        printf("[+]Listening....\n");
    }else{
        printf("[-]Error in binding.\n");
    }

    while(1){
        newSocket = accept(sockfd, (struct sockaddr*)&newAddr, &addr_size);
        if(newSocket < 0){
            exit(1);
        }
        printf("Connection accepted from %s:%d\n", inet_ntoa(newAddr.sin_addr), 
ntohs(newAddr.sin_port));

        if((childpid = fork()) == 0){
            close(sockfd);

            while(1){
                recv(newSocket, buffer, 1024, 0);
                if(strcmp(buffer, ":exit\n") == 0){
                    printf("Disconnected from %s:%d\n", inet_ntoa(newAddr.sin_addr), 
ntohs(newAddr.sin_port));
                    break;
                }else{
                    printf("Client: %s\n", buffer);
                    printf("Server: \t");
                    fgets(msg, 1024, stdin);
                    send(newSocket, msg, strlen(msg), 0);
                    bzero(buffer, sizeof(buffer));
                }
            }
        }

    }
    close(newSocket);
    return 0;
}
```

Client Code

```
// Client

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

#define PORT 4444
```

```
int main(){

    int clientSocket, ret;
    struct sockaddr_in serverAddr;
    char buffer[1024];

    clientSocket = socket(AF_INET, SOCK_STREAM, 0);
    if(clientSocket < 0){
        printf("[-]Error in connection.\n");
        exit(1);
    }
    printf("[+]Client Socket is created.\n");

    memset(&serverAddr, '\0', sizeof(serverAddr));
    serverAddr.sin_family = AF_INET;
    serverAddr.sin_port = htons(PORT);
    serverAddr.sin_addr.s_addr = inet_addr("127.0.0.1");

    ret = connect(clientSocket, (struct sockaddr*)&serverAddr, sizeof(serverAddr));
    if(ret < 0){
        printf("[-]Error in connection.\n");
        exit(1);
    }
    printf("[+]Connected to Server.\n");

    while(1){
        printf("Client: \t");
        fgets(buffer, 1024, stdin);
        send(clientSocket, buffer, strlen(buffer), 0);

        if(strcmp(buffer, ":exit\n") == 0){
            close(clientSocket);
            printf("[-]Disconnected from server.\n");
            exit(1);
        }

        if(recv(clientSocket, buffer, 1024, 0) < 0){
            printf("[-]Error in receiving data.\n");
        }else{
            printf("Server: \t%s\n", buffer);
        }
    }

    return 0;
}
```

Screenshots



```
[swapnanildhol@MacBook-Pro desktop % gcc server.c
[swapnanildhol@MacBook-Pro desktop % ./a.out
[+]Server Socket is created.
[+]Bind to port 4444
[+]Listening....
Connection accepted from 0.0.0.0:0
Client: Hello

Server:         RA1811031010010
```

```
[swapnanildhol@MacBook-Pro desktop % gcc client.c
[swapnanildhol@MacBook-Pro desktop % ./a.out
[+]Client Socket is created.
[+]Connected to Server.
Client:         Hello
Server:         RA1811031010010

Client:
```