

```

1  #include <stdio.h>
2  #include <stdlib.h>
3  #include <unistd.h>
4  #include <string.h>
5  #include <arpa/inet.h>
6  #include <sys/socket.h>
7
8  #define BUFFER_SIZE 512
9  #define PORT 8882
10
11  typedef struct data_packet{
12      int sequence_number;
13      char data[BUFFER_SIZE];
14  } Data_packet;
15
16  typedef struct ack_packet{
17      int sequence_number;
18  } Ack_packet;
19
20  void die(char* error_message){
21      perror(error_message);
22      exit(1);
23  }
24
25  int main(){
26      struct sockaddr_in other;
27      int sock, i;
28
29      char message[BUFFER_SIZE];
30      Data_packet d_pkt;
31      Ack_packet a_pkt;
32
33      if((sock = socket(AF_INET, SOCK_DGRAM, IPPROTO_UDP)) < 0)
34
35          memset((char*) &other, 0, sizeof(other));
36          other.sin_family = AF_INET;
37          other.sin_port = htons(PORT);
38          other.sin_addr.s_addr = inet_addr("127.0.0.1");
39
40          int state = 0;
41          int s_len = sizeof(other);
42
43          while(1){
44              switch(state){
45                  case 0:
46                      printf("Enter message (0):\n");
47                      fgets(d_pkt.data, sizeof(d_pkt.data), stdin);
48                      d_pkt.sequence_number = 0;
49                      if(sendto(sock, &d_pkt, sizeof(d_pkt), 0, (struct sockaddr*)
&other, s_len) == -1){
50                          die("sendto()");
51                      }
52                      state = 1;
53                      break;
54
55                  case 1:
56                      if(recvfrom(sock, &a_pkt, sizeof(a_pkt), 0, (struct sockaddr*)
&other, &s_len) == -1){
57                          die("recvfrom()");
58                      }
59                      if(a_pkt.sequence_number != 0){
60                          break;
61                      }
62                      printf("Received ack packet with sequence number %d\n",
a_pkt.sequence_number);
63                      state = 2;
64                      break;
65
66                  case 2:

```

```

67         printf("Enter message (1):\n");
68         fgets(d_pkt.data, sizeof(d_pkt.data), stdin);
69         d_pkt.sequence_number = 1;
70         if((sendto(sock, &d_pkt, sizeof(d_pkt), 0, (struct sockaddr*)
    &other, s_len)) == -1){
71             die("sendto()");
72         }
73         state = 3;
74         break;
75
76         case 3:
77             if((recvfrom(sock, &a_pkt, sizeof(a_pkt), 0, (struct
    sockaddr*) &other, &s_len)) == -1){
78                 die("recvfrom()");
79             }
80             if(a_pkt.sequence_number != 1){
81                 break;
82             }
83             printf("Received ack packet with sequence number %d\n",
    a_pkt.sequence_number);
84             state = 0;
85             break;
86         }
87     }
88
89     close(sock);
90     return 0;
91 }

```