

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <arpa/inet.h>
#include <signal.h>
#include <sys/time.h>
```

```
typedef struct {
    int seq_num;
    char data[1024];
    int flag;
} packet;
```

```
packet recv_packet,ack_packet; int
server_sock,client_sock,n,j=0; struct
sockaddr_in serveraddr,clientaddr;
socklen_t addr_size;
```

```
int main(int argc, char **argv)
{
    if(argc != 2)
    {
        printf("Error");
        exit(0);
    }
    int port =atoi(argv[1]);
```

```
    server_sock=socket(AF_INET,SOCK_DGRAM,0);
    if(server_sock ==-1)
    {
        printf("Server not created\n");
        exit(0);
    }
    printf("Server is created successfully\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");
    bind(server_sock,(struct sockaddr*)&serveraddr,sizeof(serveraddr));
    addr_size=sizeof(clientaddr);
    printf("Bind to Port number %d\n",port);
```

```
    while (1) {
```

```

        if (recvfrom(server_sock,&recv_packet,sizeof(recv_packet),0,(struct
sockaddr*)&clientaddr,&addr_size) < 0) {
            perror("recvfrom failed");
            exit(0);
        }
        printf("Frame received %s\n",recv_packet.data);
        printf("Received packet with sequence number: %d\n", recv_packet.seq_num);
        sleep(2);
        ack_packet.seq_num = recv_packet.seq_num;
        if(j!=3)
        {
            if (sendto(server_sock,&ack_packet,sizeof(ack_packet),0,(struct
sockaddr*)&clientaddr,addr_size) < 0) {          perror("sendto
failed");
                exit(EXIT_FAILURE);
            }
            printf("Sent acknowledgment for sequence number: %d\n", ack_packet.seq_num);
        }

        j++;
        if(recv_packet.flag == 1)
        {
            close(server_sock);
            exit(0);
        }
    }
    return 0;
}

```

```

#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <unistd.h>
#include <arpa/inet.h>
#include <signal.h>
#include <sys/time.h>

```

```

typedef struct {
    int seq_num;
    char data[1024];
    int flag;
} packet;

```

```

packet send_packet, recv_ack;

```

```

int main(int argc, char **argv) {

if(argc != 2)
{
    printf("Error");
    exit(0);
}
    int port = atoi(argv[1]);
    int clientsock,i=0;  struct
    sockaddr_in addr;
    fd_set readfds;
    socklen_t addr_size;
    char word[] = "Hello my name is Abithl";

    clientsock=socket(AF_INET,SOCK_DGRAM,0);
    printf("Client is created succesfully\n");
    memset(&addr,'\0',sizeof(addr));
    addr.sin_family=AF_INET;  addr.sin_port=htons(port);
    addr.sin_addr.s_addr=inet_addr("127.0.0.1");

    int base=0>window_size=3,j=0,flag=0;
    int length=strlen(word);
    addr_size=sizeof(addr);

    while (1) {
        for(int i=base;i<window_size;i++)
        {
            send_packet.data[i]=word[i];
            if(window_size > strlen(word))
            {
                flag=1;
                send_packet.flag=1;
            }
        }
        send_packet.seq_num=j++;
        sendto(clientsock,&send_packet,sizeof(send_packet),0,(struct sockaddr*)&addr,addr_size);
        printf("Frame sent\n");

        FD_ZERO(&readfds);
        FD_SET(clientsock, &readfds);
        struct timeval timeout;
        timeout.tv_sec = 3;
        timeout.tv_usec = 0;

        int a = select(clientsock+1, &readfds, NULL, NULL, &timeout);
        if (a == -1) {

```

```

        perror("select");
        exit(EXIT_FAILURE);
    }
    else if (a == 0) {
        printf("Timeout occurred. No data received from server.\n");

        window_size=3;

        j=0;
        base=0;
        bzero(send_packet.data,1024);
        length=strlen(word);
    }
else{
    recvfrom(clientsock,&recv_ack,sizeof(recv_ack),0,(struct sockaddr*)&addr,&addr_size);
    printf("Received acknowledgment for sequence number: %d\n", recv_ack.seq_num);
    base=window_size;
    if(length <=3)
    {
        window_size=length;
    }
    else
    {
        window_size=window_size+3;
        length=length-3;
    }
    }
    if(flag==1)
    {
        close(clientsock);
        exit(0);
    }

}

return 0;
}

```

21BR14263@administrator-PowerEdge-R820:~/networklab\$./stop 5001

Server is created successfully

Bind to Port number 5001

Frame received Hel

Received packet with sequence number: 0

Sent acknowledgment for sequence number: 0

Frame received Hello
Received packet with sequence number: 1
Sent acknowledgment for sequence number: 1
Frame received Hello bruh
Received packet with sequence number: 2
Sent acknowledgment for sequence number: 2
Frame received Hello my name
Received packet with sequence number: 3
Frame received Hel
Received packet with sequence number: 0
Sent acknowledgment for sequence number: 0
Frame received Hello
Received packet with sequence number: 1
Sent acknowledgment for sequence number: 1
Frame received Hello my
Received packet with sequence number: 2
Sent acknowledgment for sequence number: 2
Frame received Hello my nam
Received packet with sequence number: 3
Sent acknowledgment for sequence number: 3
Frame received Hello my name i
Received packet with sequence number: 4
Sent acknowledgment for sequence number: 4
Frame received Hello my name is g
Received packet with sequence number: 5
Sent acknowledgment for sequence number: 5
Frame received Hello my name is Adwaith
Received packet with sequence number: 6
Sent acknowledgment for sequence number: 6
Frame received Hello my name is Adwaith
Received packet with sequence number: 7
Sent acknowledgment for sequence number: 7
Abith@Abith:~/networklab/sample\$

21BR14263@administrator-PowerEdge-R820:~/networklab\$./wait 5001
Client is created succesfully
Frame sent
Received acknowledgment for sequence number: 0
Frame sent
Received acknowledgment for sequence number: 1
Frame sent
Received acknowledgment for sequence number: 2
Frame sent
Timeout occurred. No data received from server.
Frame sent
Received acknowledgment for sequence number: 0

Frame sent

Received acknowledgment for sequence number: 1

Frame sent

Received acknowledgment for sequence number: 2

Frame sent

Received acknowledgment for sequence number: 3

Frame sent

Received acknowledgment for sequence number: 4

Frame sent

Received acknowledgment for sequence number: 5

Frame sent

Received acknowledgment for sequence number: 6

Frame sent

Received acknowledgment for sequence number: 7