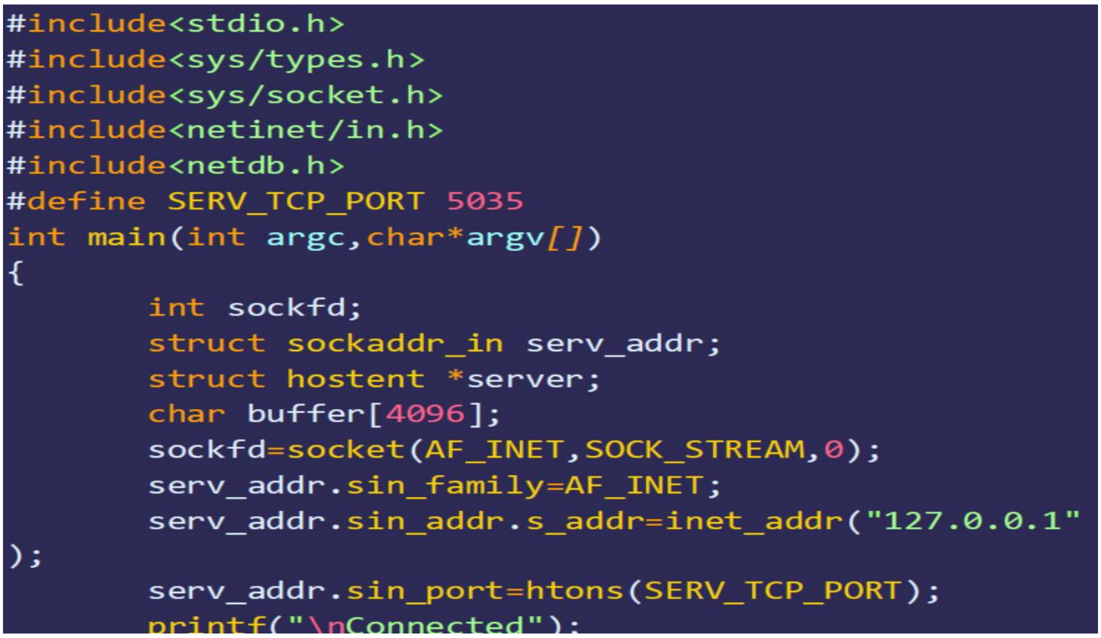
CN LAB – 1

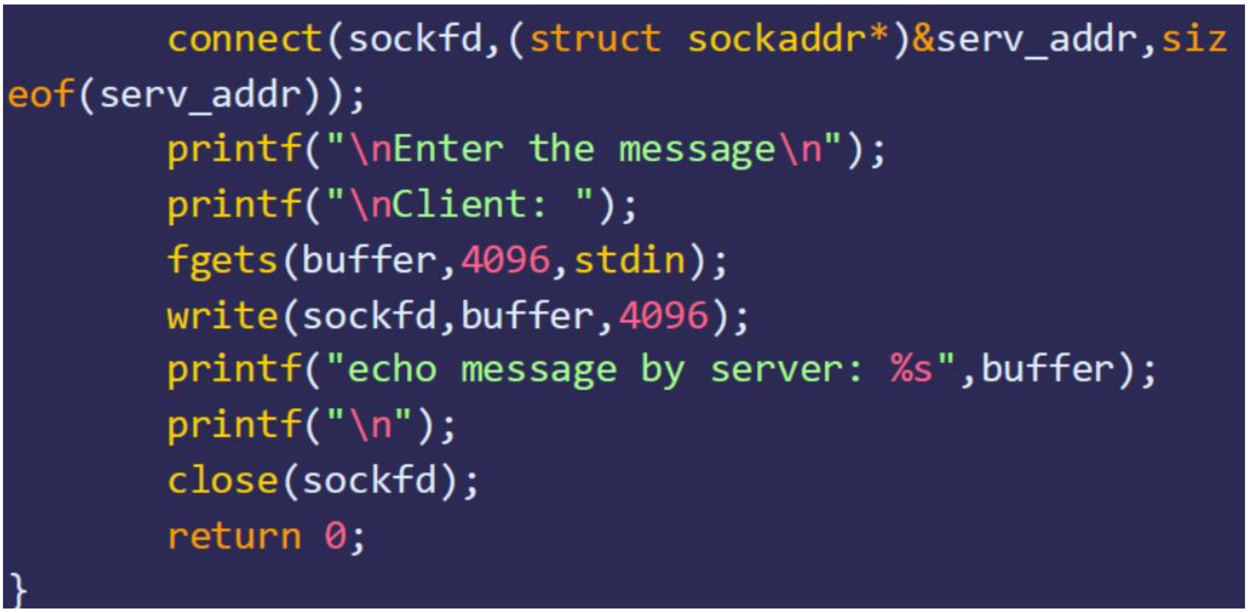
Objective 1:

To implement an Echo client server using tcp/ip:

CLIENT:

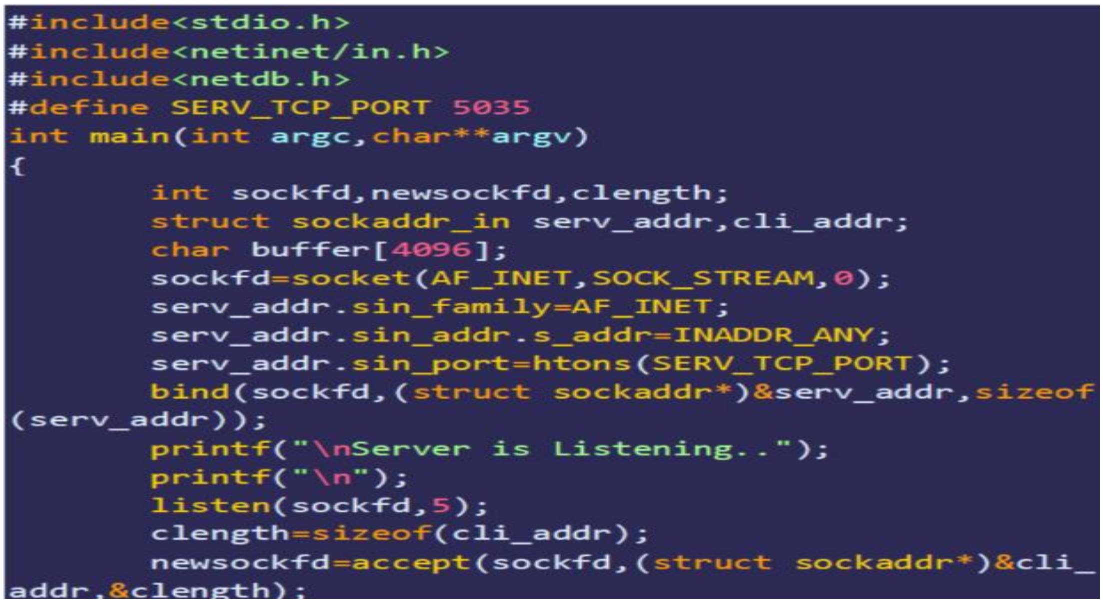


```
#include<stdio.h>
#include<sys/types.h>
#include<sys/socket.h>
#include<netinet/in.h>
#include<netdb.h>
#define SERV_TCP_PORT 5035
int main(int argc,char*argv[])
{
        int sockfd;
        struct sockaddr_in serv_addr;
        struct hostent *server;
        char buffer[4096];
        sockfd=socket(AF_INET,SOCK_STREAM,0);
        serv_addr.sin_family=AF_INET;
        serv_addr.sin_addr.s_addr=inet_addr("127.0.0.1"
);
        serv_addr.sin_port=htons(SERV_TCP_PORT);
        printf("\nConnected");
```

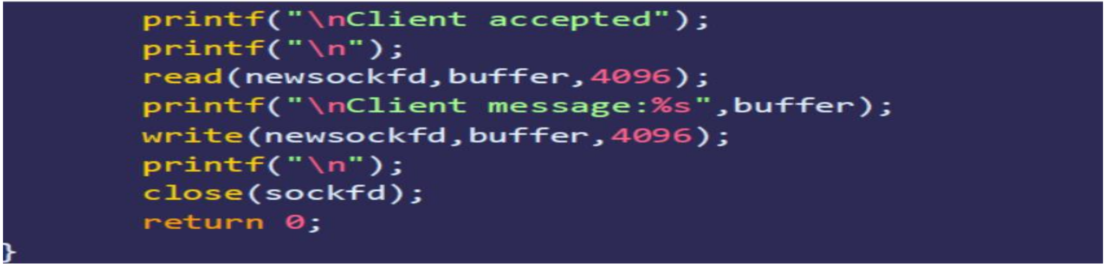


```
        connect(sockfd,(struct sockaddr*)&serv_addr,siz
eof(serv_addr));
        printf("\nEnter the message\n");
        printf("\nClient: ");
        fgets(buffer,4096,stdin);
        write(sockfd,buffer,4096);
        printf("echo message by server: %s",buffer);
        printf("\n");
        close(sockfd);
        return 0;
}
```

SERVER:

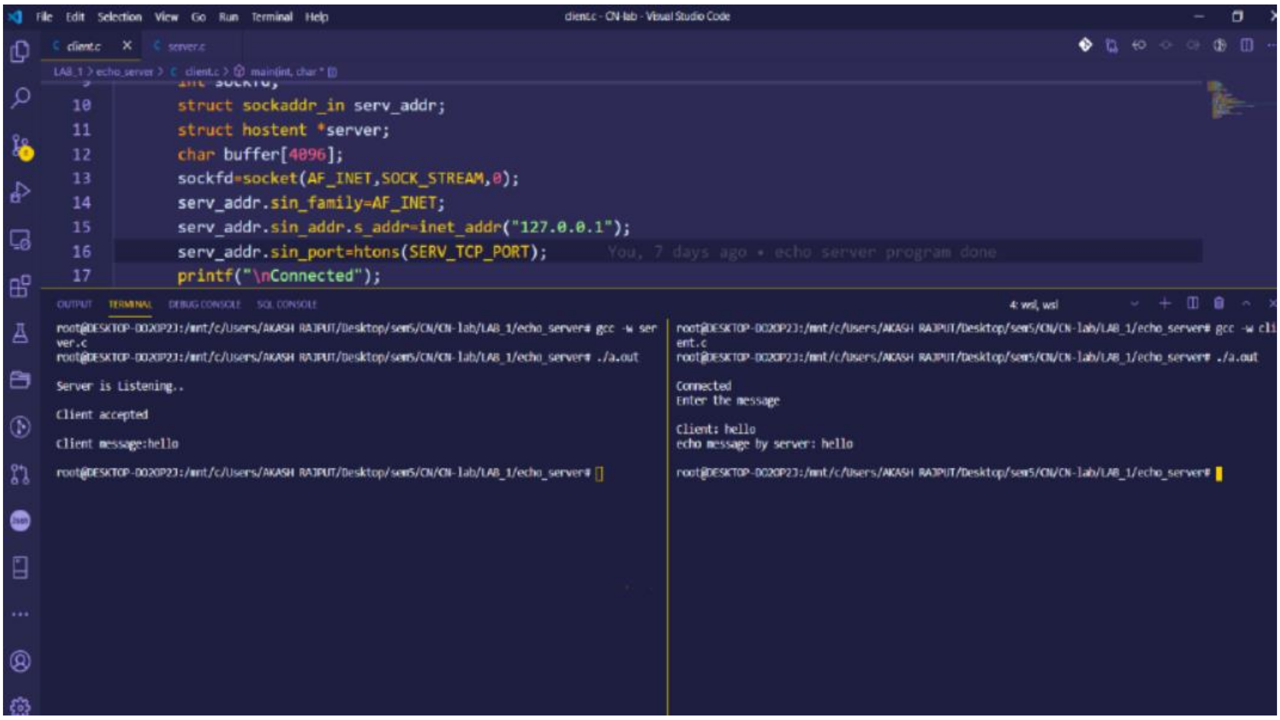


```
#include<stdio.h>
#include<netinet/in.h>
#include<netdb.h>
#define SERV_TCP_PORT 5035
int main(int argc,char**argv)
{
        int sockfd,newsockfd,clength;
        struct sockaddr_in serv_addr,cli_addr;
        char buffer[4096];
        sockfd=socket(AF_INET,SOCK_STREAM,0);
        serv_addr.sin_family=AF_INET;
        serv_addr.sin_addr.s_addr=INADDR_ANY;
        serv_addr.sin_port=htons(SERV_TCP_PORT);
        bind(sockfd,(struct sockaddr*)&serv_addr,sizeof
(serv_addr));
        printf("\nServer is Listening..");
        printf("\n");
        listen(sockfd,5);
        clength=sizeof(cli_addr);
        newsockfd=accept(sockfd,(struct sockaddr*)&cli_
addr,&clength);
```



```
        printf("\nClient accepted");
        printf("\n");
        read(newsockfd,buffer,4096);
        printf("\nClient message:%s",buffer);
        write(newsockfd,buffer,4096);
        printf("\n");
        close(sockfd);
        return 0;
}
```

OUTPUT:


File Edit Selection View Go Run Terminal Help
client.c - CN-lab - Visual Studio Code
client.c
server.c
LAB_1 > echo_server > client.c > main(int, char *
OUTPUT
TERMINAL
DEBUG CONSOLE
SQL CONSOLE
4: wsl, wsl

```c
    int sockfd;
    struct sockaddr_in serv_addr;
    struct hostent *server;
    char buffer[4096];
    sockfd=socket(AF_INET,SOCK_STREAM,0);
    serv_addr.sin_family=AF_INET;
    serv_addr.sin_addr.s_addr=inet_addr("127.0.0.1");
    serv_addr.sin_port=htons(SERV_TCP_PORT);        You, 7 days ago • echo server program done
    printf("\nConnected");
```

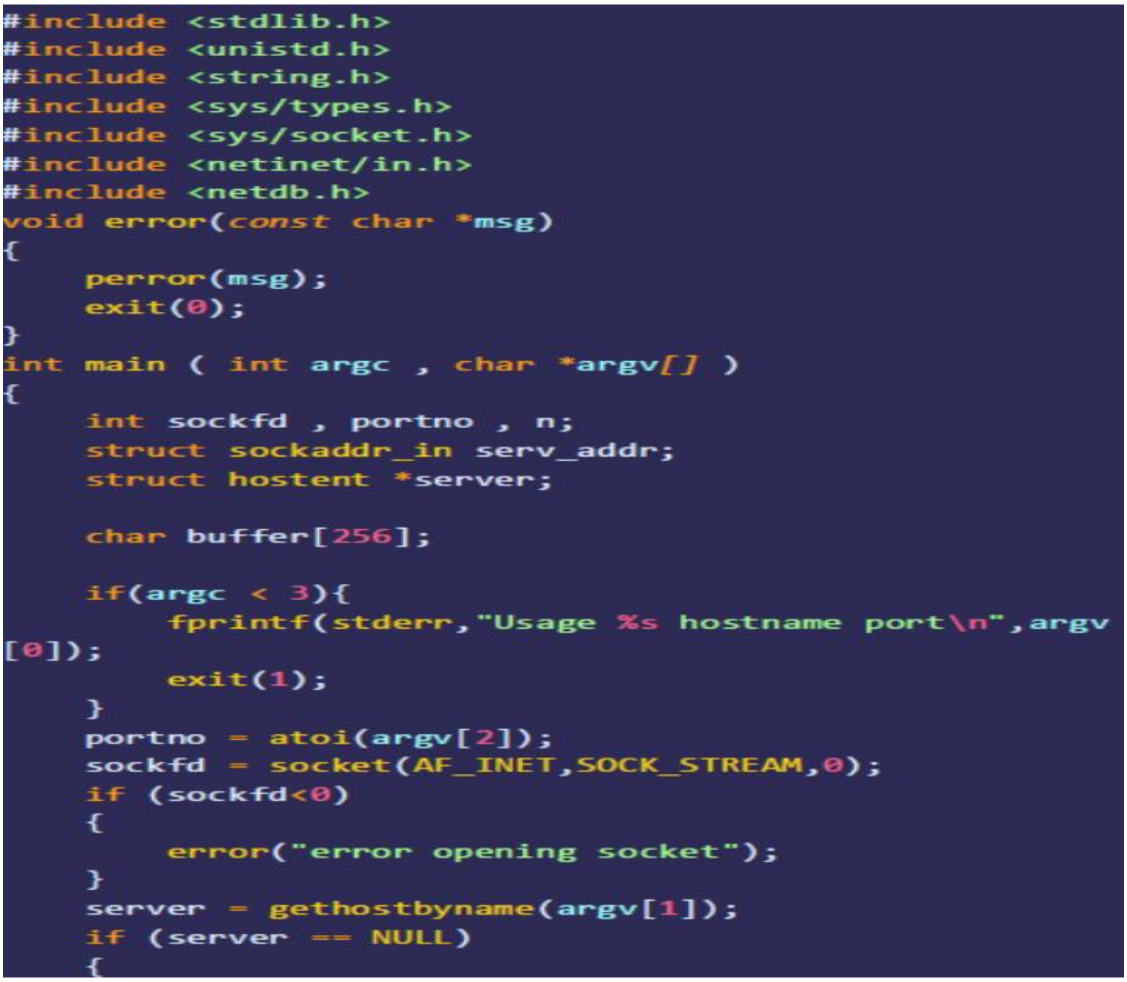
```
root@DESKTOP-DO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/echo_server# gcc -w ser
ver.c
root@DESKTOP-DO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/echo_server# ./a.out

Server is Listening..

Client accepted

Client message:hello

root@DESKTOP-DO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/echo_server# 
```

```
root@DESKTOP-DO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/echo_server# gcc -w cli
ent.c
root@DESKTOP-DO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/echo_server# ./a.out

Connected
Enter the message

Client: hello
echo message by server: hello

root@DESKTOP-DO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/echo_server# 
```

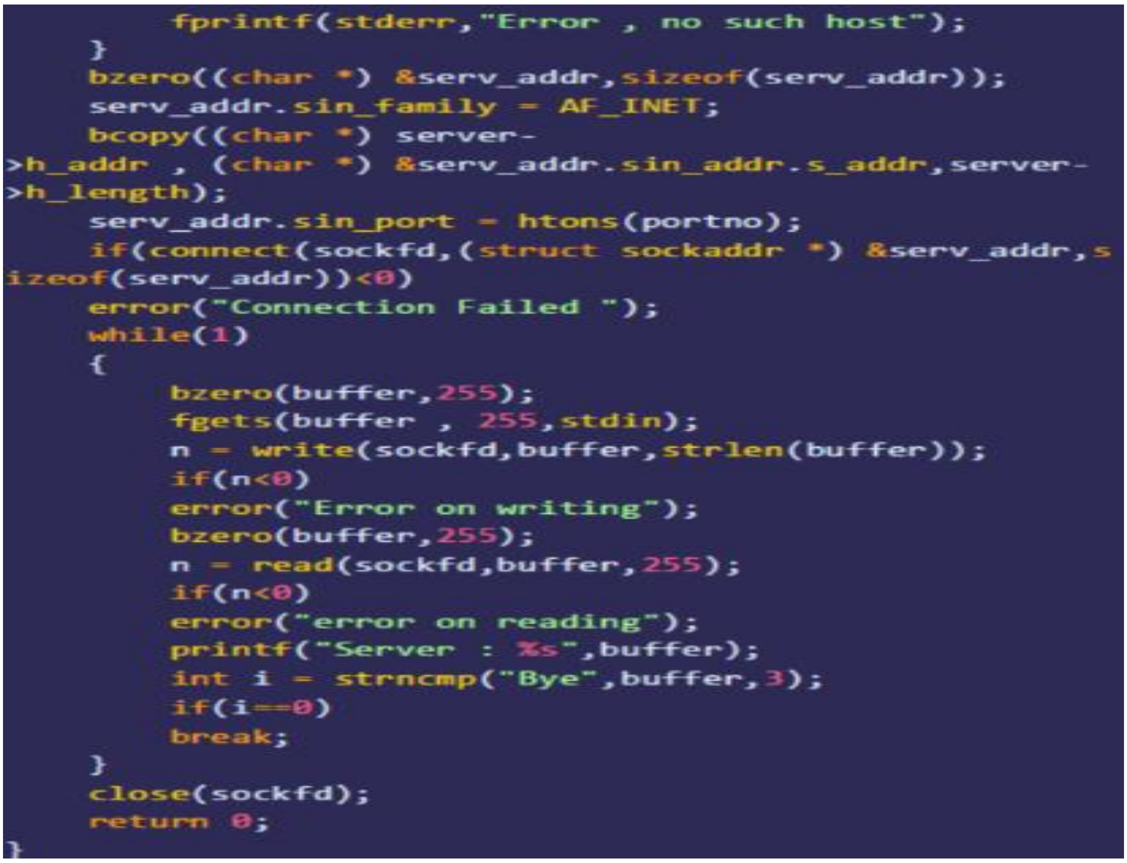
Objective 2:

To implement a chat of client server communication using tcp/ip:

CLIENT:

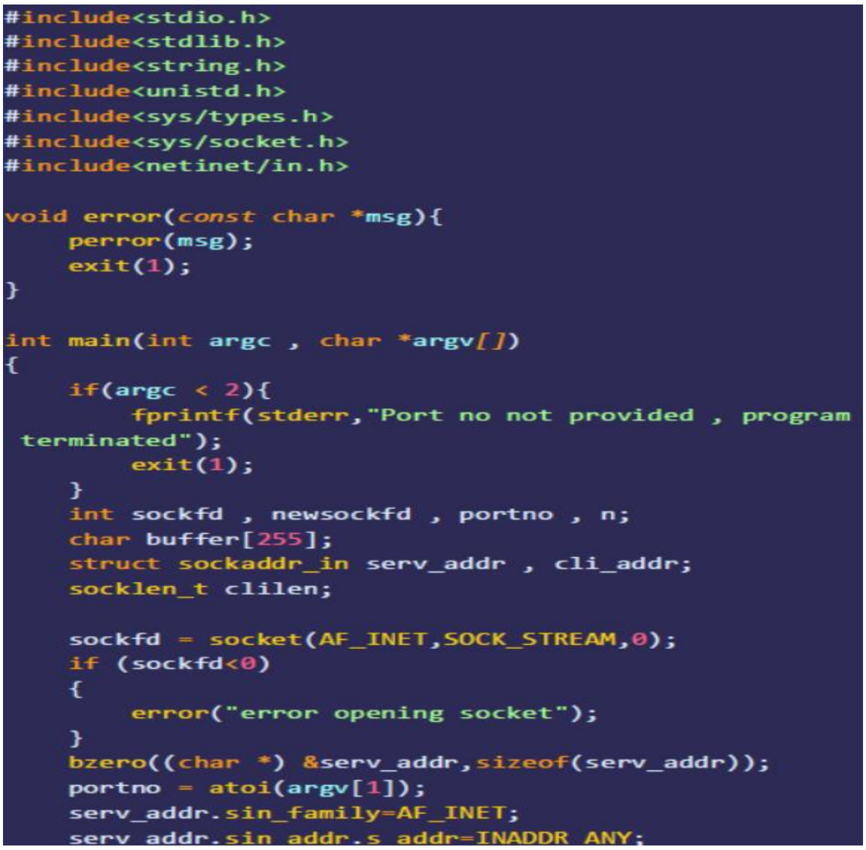


```
#include <stdlib.h>
#include <unistd.h>
#include <string.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <netdb.h>
void error(const char *msg)
{
    perror(msg);
    exit(0);
}
int main ( int argc , char *argv[] )
{
    int sockfd , portno , n;
    struct sockaddr_in serv_addr;
    struct hostent *server;

    char buffer[256];

    if(argc < 3){
        fprintf(stderr,"Usage %s hostname port\n",argv
[0]);
        exit(1);
    }
    portno = atoi(argv[2]);
    sockfd = socket(AF_INET,SOCK_STREAM,0);
    if (sockfd<0)
    {
        error("error opening socket");
    }
    server = gethostbyname(argv[1]);
    if (server == NULL)
    {
```

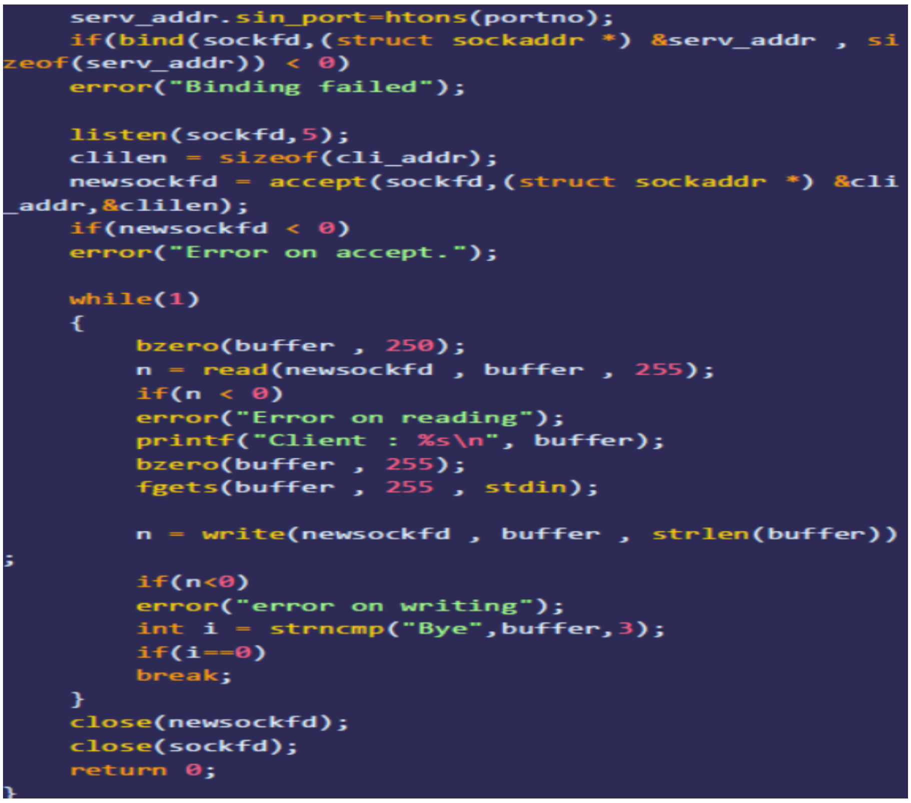


```
        fprintf(stderr,"Error , no such host");
    }
    bzero((char *) &serv_addr,sizeof(serv_addr));
    serv_addr.sin_family = AF_INET;
    bcopy((char *) server-
>h_addr , (char *) &serv_addr.sin_addr.s_addr,server-
>h_length);
    serv_addr.sin_port = htons(portno);
    if(connect(sockfd,(struct sockaddr *) &serv_addr,s
izeof(serv_addr))<0)
    error("Connection Failed ");
    while(1)
    {
        bzero(buffer,255);
        fgets(buffer , 255,stdin);
        n = write(sockfd,buffer,strlen(buffer));
        if(n<0)
        error("Error on writing");
        bzero(buffer,255);
        n = read(sockfd,buffer,255);
        if(n<0)
        error("error on reading");
        printf("Server : %s",buffer);
        int i = strncmp("Bye",buffer,3);
        if(i==0)
        break;
    }
    close(sockfd);
    return 0;
}
```

SERVER:

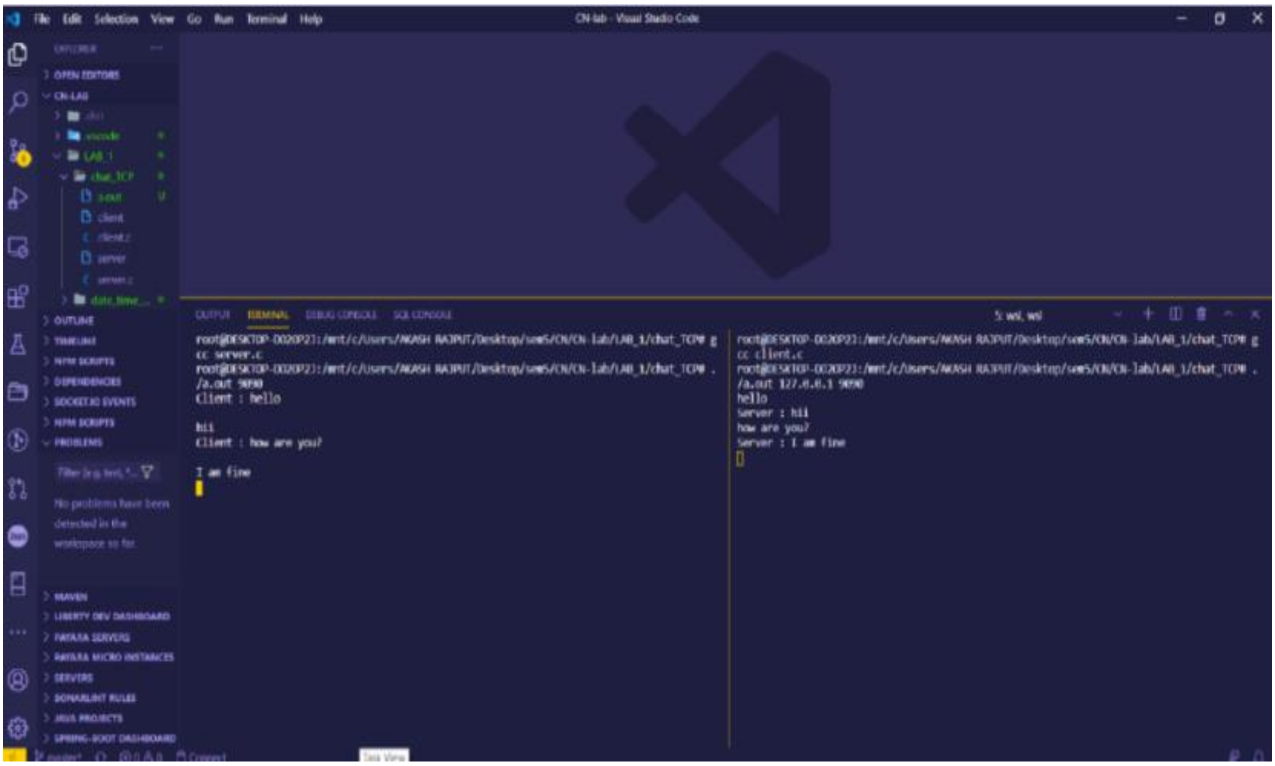


```
#include<stdio.h>
#include<stdlib.h>
#include<string.h>
#include<unistd.h>
#include<sys/types.h>
#include<sys/socket.h>
#include<netinet/in.h>

void error(const char *msg){
    perror(msg);
    exit(1);
}

int main(int argc , char *argv[])
{
    if(argc < 2){
        fprintf(stderr,"Port no not provided , program
 terminated");
        exit(1);
    }
    int sockfd , newsockfd , portno , n;
    char buffer[255];
    struct sockaddr_in serv_addr , cli_addr;
    socklen_t clilen;

    sockfd = socket(AF_INET,SOCK_STREAM,0);
    if (sockfd<0)
    {
        error("error opening socket");
    }
    bzero((char *) &serv_addr,sizeof(serv_addr));
    portno = atoi(argv[1]);
    serv_addr.sin_family=AF_INET;
    serv_addr.sin_addr.s_addr=INADDR_ANY;
```



```
    serv_addr.sin_port=htons(portno);
    if(bind(sockfd,(struct sockaddr *) &serv_addr , si
zeof(serv_addr)) < 0)
    error("Binding failed");

    listen(sockfd,5);
    clilen = sizeof(cli_addr);
    newsockfd = accept(sockfd,(struct sockaddr *) &cli
_addr,&clilen);
    if(newsockfd < 0)
    error("Error on accept.");

    while(1)
    {
        bzero(buffer , 250);
        n = read(newsockfd , buffer , 255);
        if(n < 0)
        error("Error on reading");
        printf("Client : %s\n", buffer);
        bzero(buffer , 255);
        fgets(buffer , 255 , stdin);

        n = write(newsockfd , buffer , strlen(buffer))
;
        if(n<0)
        error("error on writing");
        int i = strncmp("Bye",buffer,3);
        if(i==0)
        break;
    }
    close(newsockfd);
    close(sockfd);
    return 0;
}
```

OUTPUT:



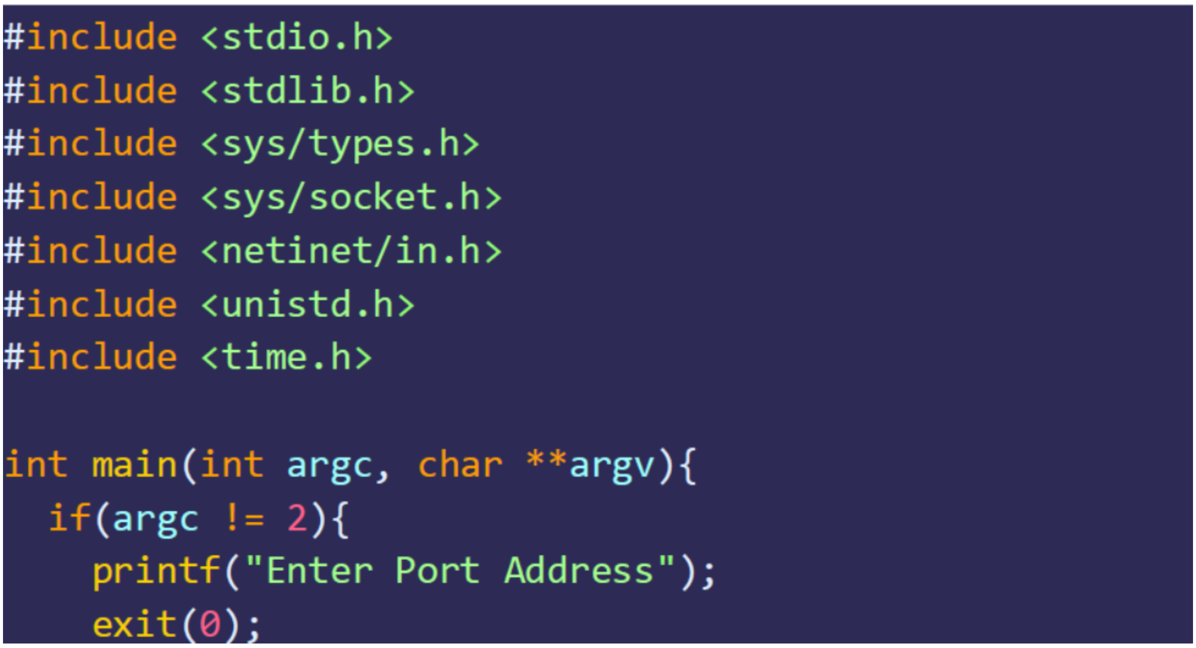
```
root@DESKTOP-OO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/chat_TCP# g
cc server.c
root@DESKTOP-OO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/chat_TCP# .
/a.out 9090
Client : hello

hii
Client : how are you?

I am fine
```

```
root@DESKTOP-OO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/chat_TCP# g
cc client.c
root@DESKTOP-OO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/chat_TCP# .
/a.out 127.0.0.1 9090
hello
Server : hii
how are you?
Server : I am fine
```

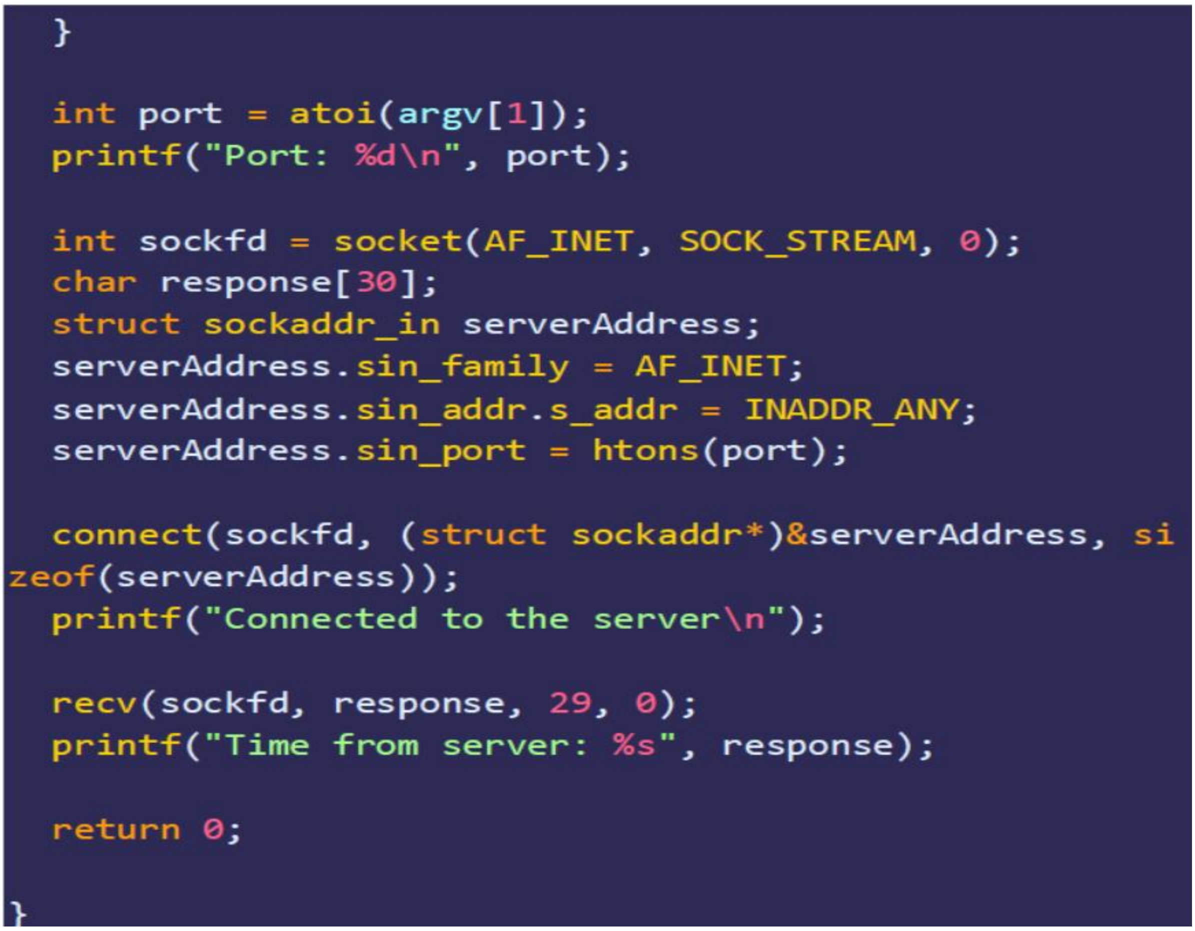
Objective 3:

To implement date and time display from client to server using tcp sockets:

CLIENT:

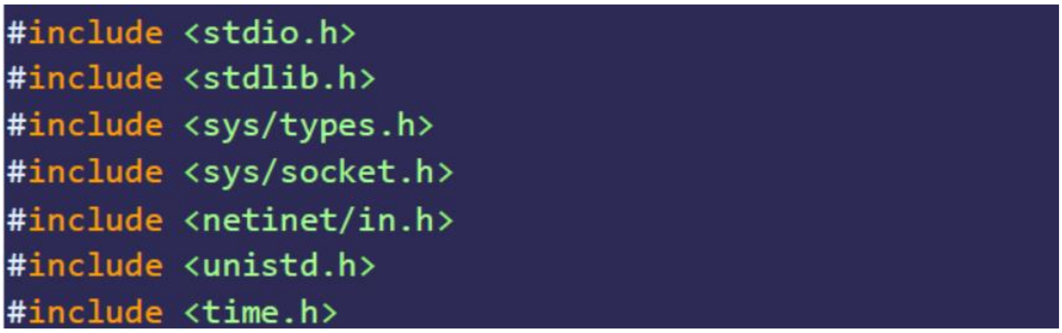


```
#include <stdio.h>
#include <stdlib.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <unistd.h>
#include <time.h>

int main(int argc, char **argv){
  if(argc != 2){
    printf("Enter Port Address");
    exit(0);
```

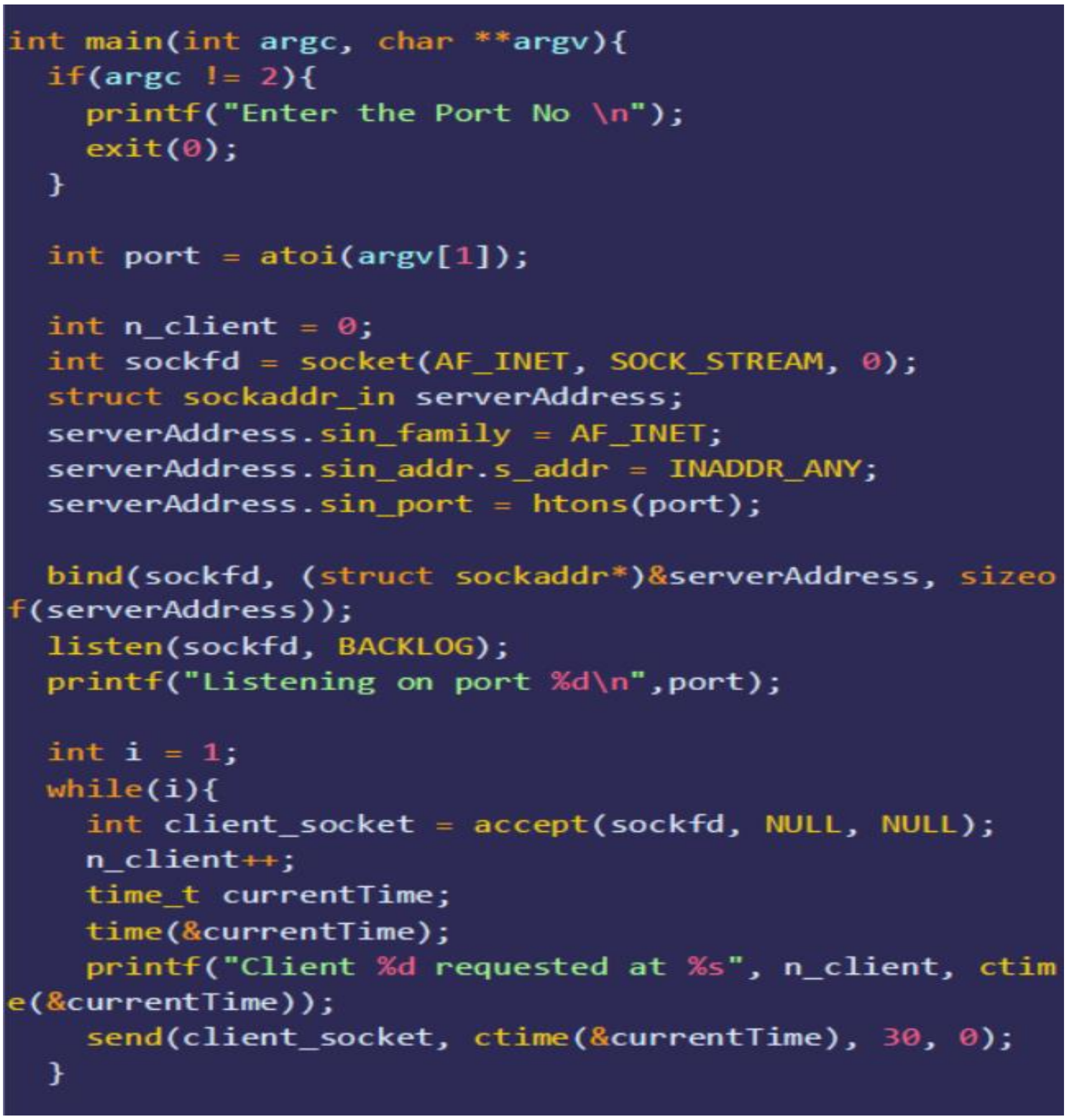


```
  }

  int port = atoi(argv[1]);
  printf("Port: %d\n", port);

  int sockfd = socket(AF_INET, SOCK_STREAM, 0);
  char response[30];
  struct sockaddr_in serverAddress;
  serverAddress.sin_family = AF_INET;
  serverAddress.sin_addr.s_addr = INADDR_ANY;
  serverAddress.sin_port = htons(port);

  connect(sockfd, (struct sockaddr*)&serverAddress, si
zeof(serverAddress));
  printf("Connected to the server\n");

  recv(sockfd, response, 29, 0);
  printf("Time from server: %s", response);

  return 0;

}
```

SERVER:

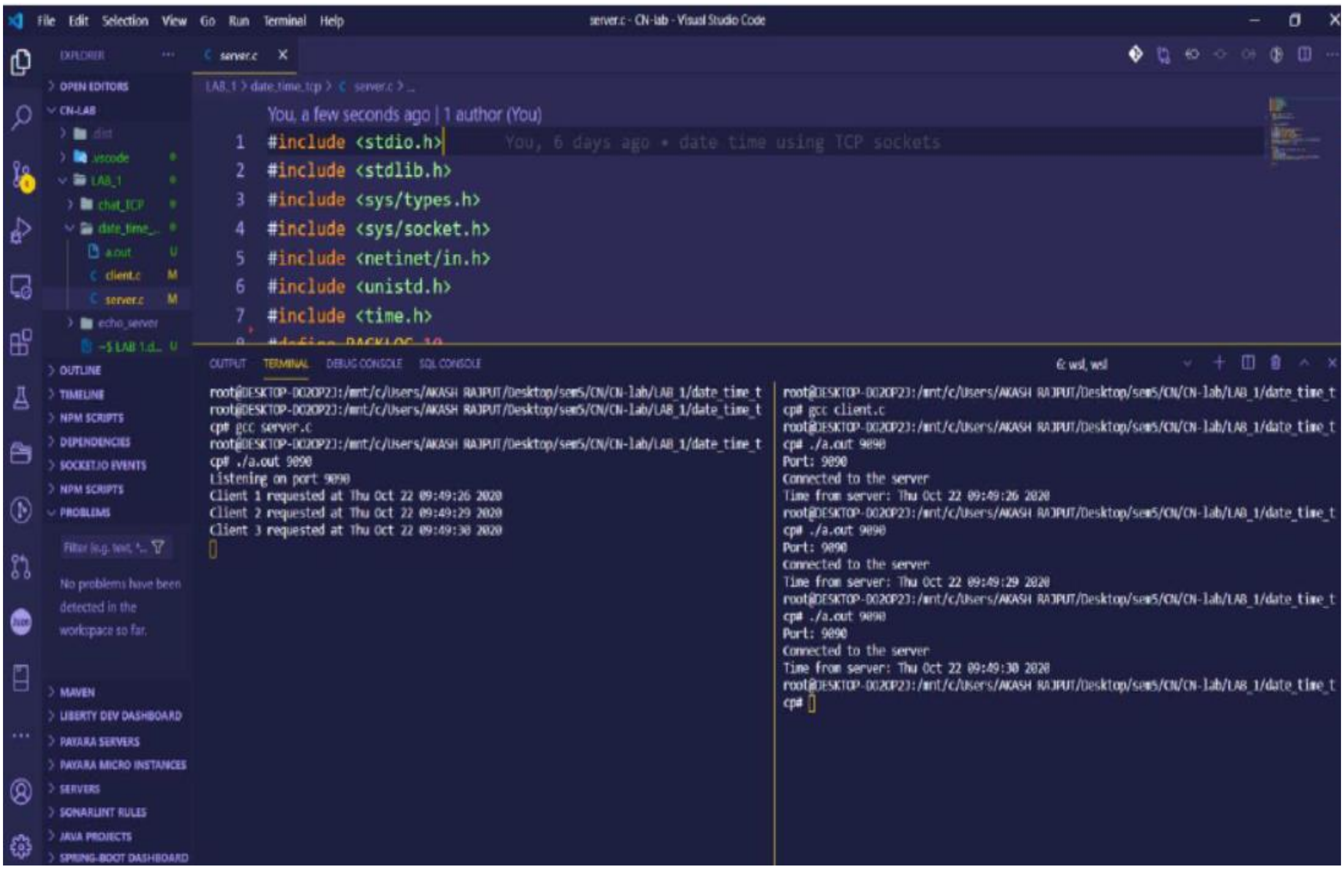


```c
#include <stdio.h>
#include <stdlib.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <unistd.h>
#include <time.h>
```



```c
int main(int argc, char **argv){
  if(argc != 2){
    printf("Enter the Port No \n");
    exit(0);
  }

  int port = atoi(argv[1]);

  int n_client = 0;
  int sockfd = socket(AF_INET, SOCK_STREAM, 0);
  struct sockaddr_in serverAddress;
  serverAddress.sin_family = AF_INET;
  serverAddress.sin_addr.s_addr = INADDR_ANY;
  serverAddress.sin_port = htons(port);

  bind(sockfd, (struct sockaddr*)&serverAddress, sizeo
f(serverAddress));
  listen(sockfd, BACKLOG);
  printf("Listening on port %d\n",port);

  int i = 1;
  while(i){
    int client_socket = accept(sockfd, NULL, NULL);
    n_client++;
    time_t currentTime;
    time(&currentTime);
    printf("Client %d requested at %s", n_client, ctim
e(&currentTime));
    send(client_socket, ctime(&currentTime), 30, 0);
  }
```

OUTPUT:



You, a few seconds ago | 1 author (You)

```c
#include <stdio.h>        You, 6 days ago • date time using TCP sockets
#include <stdlib.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <netinet/in.h>
#include <unistd.h>
#include <time.h>
#define BACKLOG 10
```

```
root@DESKTOP-DO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/date_time_t
root@DESKTOP-DO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/date_time_t
cp# gcc server.c
root@DESKTOP-DO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/date_time_t
cp# ./a.out 9090
Listening on port 9090
Client 1 requested at Thu Oct 22 09:49:26 2020
Client 2 requested at Thu Oct 22 09:49:29 2020
Client 3 requested at Thu Oct 22 09:49:30 2020
```

```
root@DESKTOP-DO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/date_time_t
cp# gcc client.c
root@DESKTOP-DO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/date_time_t
cp# ./a.out 9090
Port: 9090
Connected to the server
Time from server: Thu Oct 22 09:49:26 2020
root@DESKTOP-DO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/date_time_t
cp# ./a.out 9090
Port: 9090
Connected to the server
Time from server: Thu Oct 22 09:49:29 2020
root@DESKTOP-DO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/date_time_t
cp# ./a.out 9090
Port: 9090
Connected to the server
Time from server: Thu Oct 22 09:49:30 2020
root@DESKTOP-DO2OP2J:/mnt/c/Users/AKASH RAJPUT/Desktop/sem5/CN/CN-lab/LAB_1/date_time_t
cp#
```

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