NAME – AKASH KUMAR SINGH

REGD NO. 1841017025

CSIT A

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");
```

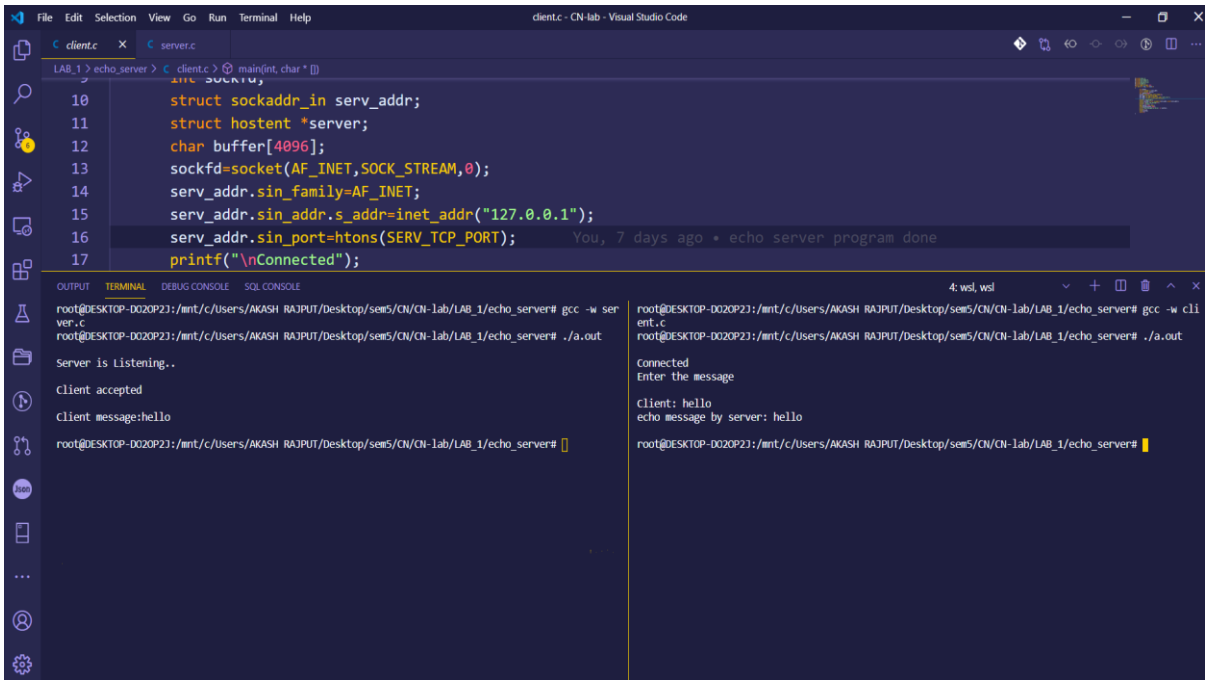
```
        connect(sockfd,(struct sockaddr*)&serv_addr,siz
eof(serv_addr));
        printf("\nEnter the message\n");
        printf("\nClient: ");
        fgets(buffer,4096,stdin);
        write(sockfd,buffer,4096);
        printf("echo message by server: %s",buffer);
        printf("\n");
        close(sockfd);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



OBJECTIVE 2>

TO IMPLEMENT A CHAT OF CLIENT SERVER COMMUNICATION USING TCP/IP.

CLIENT

```
#include <stdio.h>
```

```c
#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)
    {
```

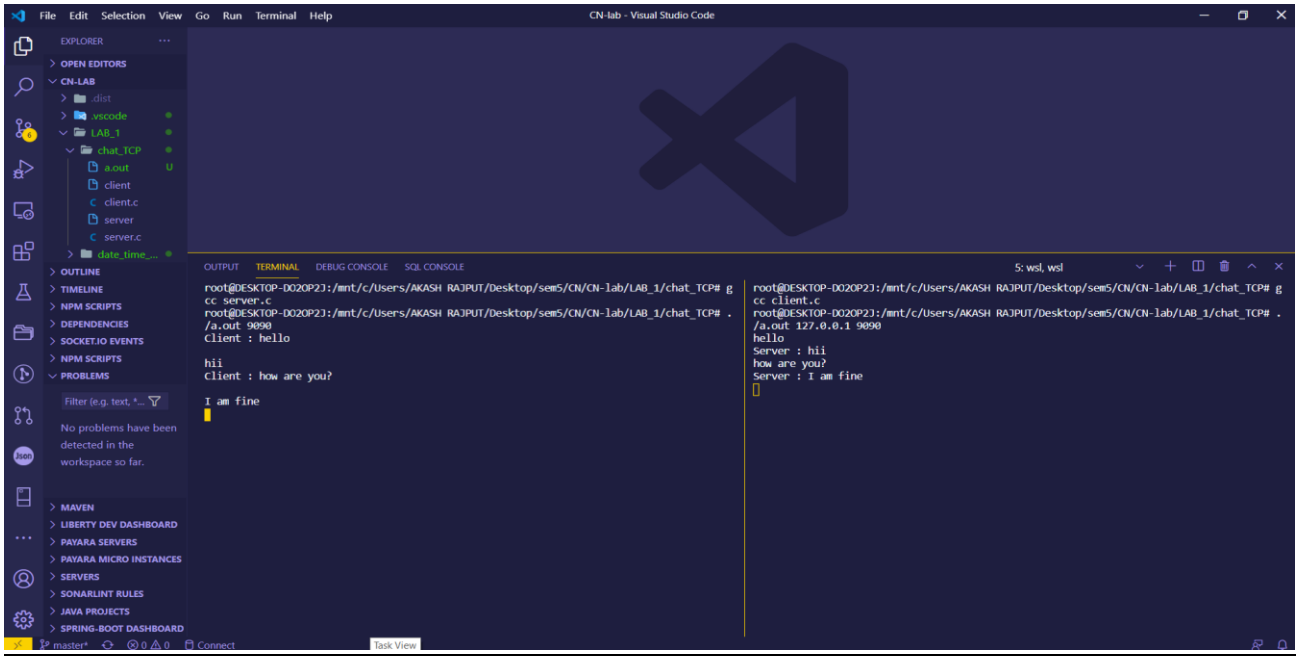
```
        fprintf(stderr,"Error , no such host");
    }
    bzero((char *) &serv_addr,sizeof(serv_addr));
    serv_addr.sin_family = AF_INET;
    bcopy((char *) server-
>h_addr , (char *) &serv_addr.sin_addr.s_addr,server-
>h_length);
    serv_addr.sin_port = htons(portno);
    if(connect(sockfd,(struct 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

```c
#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 –



OBJECTIVE 3>

TO IMPLEMENT DATE AND TIME DISPLAY FROM CLIENT TO SERVER USING TCP SOCKETS.

CLIENT

```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>

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;

}
```

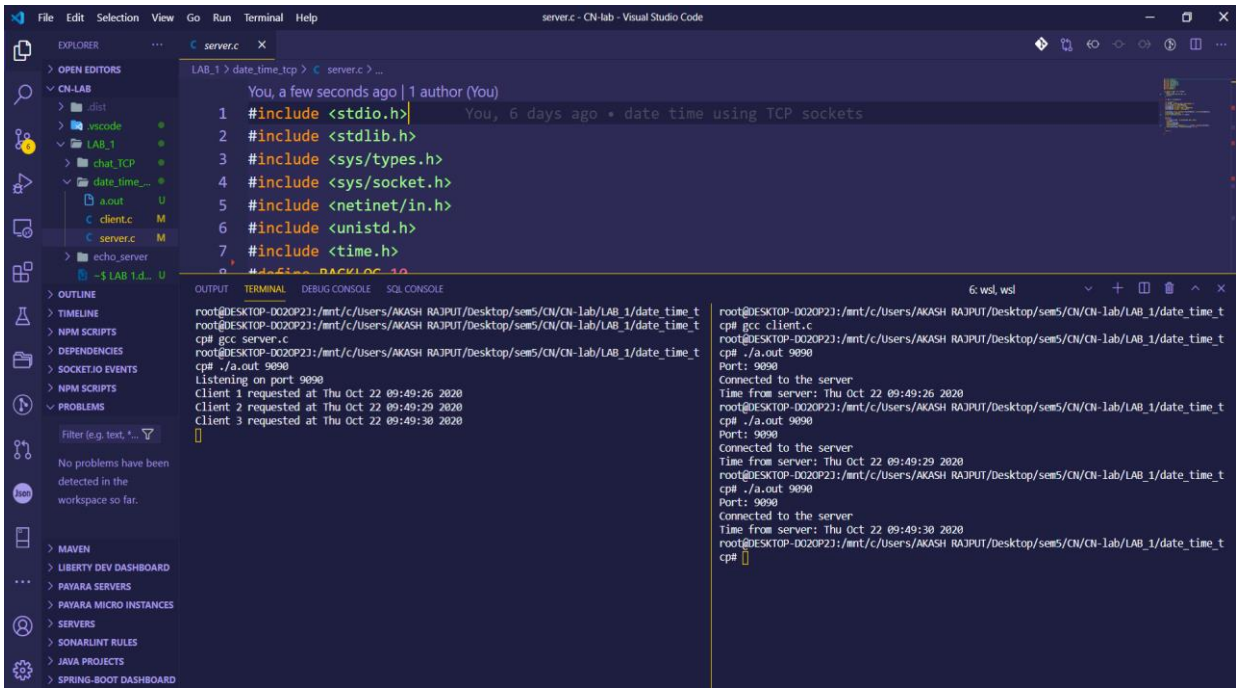
SERVER

```
#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
#define BACKLOG 10

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);
  }

  return 0;
```

```
}
```

Output-


File Edit Selection View Go Run Terminal Help
server.c - CN-lab - Visual Studio Code
EXPLORER
server.c
OPEN EDITORS
CN-LAB
LAB_1 > date_time_tcp > server.c > ...
You, a few seconds ago | 1 author (You)
1 #include <stdio.h> You, 6 days ago • date time using TCP sockets
2 #include <stdlib.h>
3 #include <sys/types.h>
4 #include <sys/socket.h>
5 #include <netinet/in.h>
6 #include <unistd.h>
7 #include <time.h>
OUTLINE
TIMELINE
NPM SCRIPTS
DEPENDENCIES
SOCKET.IO EVENTS
NPM SCRIPTS
PROBLEMS
No problems have been detected in the workspace so far.
MAVEN
LIBERTY DEV DASHBOARD
PAYARA SERVERS
PAYARA MICRO INSTANCES
SERVERS
SONARLINT RULES
JAVA PROJECTS
SPRING-BOOT DASHBOARD
OUTPUT TERMINAL DEBUG CONSOLE SQL CONSOLE
6: wsl, wsl
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#