Experiment 1

Objective 2
To implement a chat of client and server communication using TCP.

Code

server.c

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

int main()
{
        int listenfd,connfd,len,n;
        char buff[200];

        struct sockaddr_in servaddr,cliaddr;
        len=sizeof(servaddr);
        servaddr.sin_family=AF_INET;

        servaddr.sin_addr.s_addr=htons( INADDR_ANY);

        servaddr.sin_port=htons(0);
        listenfd=socket(AF_INET,SOCK_STREAM,0);
        bind(listenfd, (struct sockaddr *)&servaddr,len);
        getsockname(listenfd,(struct sockaddr *)&servaddr ,&len);
        printf("Port for client: %ld\n",(long)ntohs(servaddr.sin_port));

        printf("\nEnter Ctrl+C to terminate the chat...\n");
        do
        {
                listen(listenfd,5);
                connfd=accept(listenfd,(struct sockaddr *)&cliaddr ,&len);
                n=read(connfd , buff ,sizeof(buff));

                buff[n]=0;

                printf("\nClient: %s\n" , buff);

                //Server writes
                printf("\nYou: ");
                scanf("%s" , buff);
                write(connfd, buff ,sizeof(buff));

        }while(1);
```

```
        return 0;
}


client.c

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

int main()
{
        int sockfd,len,n;
        long port;
        char buff[200];
        struct sockaddr_in cliaddr;
        len=sizeof(cliaddr);

        printf("Enter the port number you got from Server side:");
        scanf("%ld" ,&port);

        cliaddr.sin_family=AF_INET;
        cliaddr.sin_addr.s_addr=inet_addr("127.0.0.1");
        cliaddr.sin_port=htons(port);

        printf("\nEnter Ctrl+C to terminate the chat...\n");
        do
        {
                sockfd=socket(AF_INET,SOCK_STREAM,0);
                connect(sockfd,(struct sockaddr *)&cliaddr,len);
                printf("\nYou: ");
                scanf("%s", buff);
                write(sockfd, buff ,sizeof(buff));
                n=read(sockfd,buff ,sizeof(buff));

                buff[n]=0;

                printf("\nServer: %s\n" , buff);

        }while(1);

        return 0;
}
```
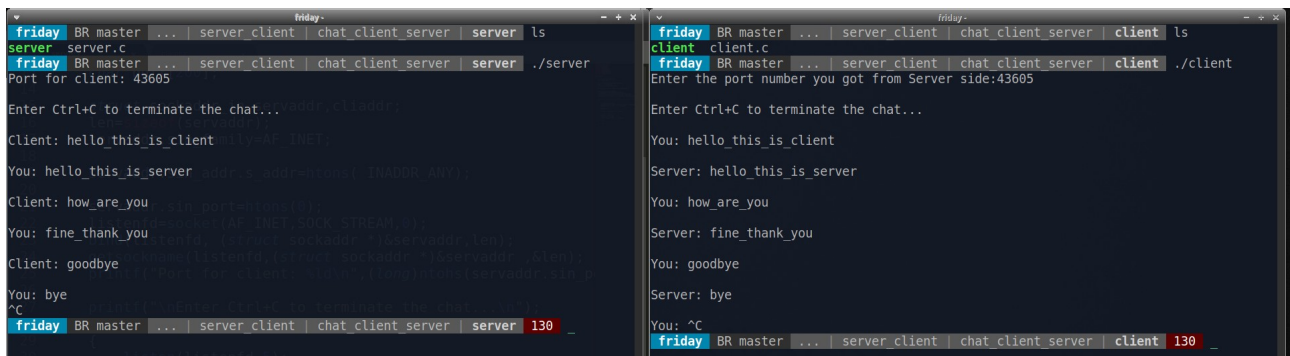
Output

Objective 3
To implement date and time display during the chat of client and server using TCP socket.

server.c

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

int main()
{
        time_t t;
        int listenfd,connfd,len,n;
        char buff[200];

        struct sockaddr_in servaddr,cliaddr;
        len=sizeof(servaddr);
        servaddr.sin_family=AF_INET;

        servaddr.sin_addr.s_addr=htons( INADDR_ANY);

        servaddr.sin_port=htons(0);
        listenfd=socket(AF_INET,SOCK_STREAM,0);
        bind(listenfd, (struct sockaddr *)&servaddr,len);
        getsockname(listenfd,(struct sockaddr *)&servaddr ,&len);
        printf("Port for client: %ld\n",(long)ntohs(servaddr.sin_port));
```

```c
        printf("\nEnter Ctrl+C to terminate the chat...\n");
        do
        {
                listen(listenfd,5);
                connfd=accept(listenfd,(struct sockaddr *)&cliaddr ,&len);
                n=read(connfd , buff ,sizeof(buff));

                buff[n]=0;

                time(&t);
                printf("\n%sClient: %s\n" , ctime(&t), buff);

                //Server writes
                printf("\nYou: ");
                scanf("%s" , buff);
                write(connfd, buff ,sizeof(buff));

        }while(1);

        return 0;
}
```

client.c

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

int main()
{
        time_t t;
        int sockfd,len,n;
        long port;
        char buff[200];

        struct sockaddr_in cliaddr;
        len=sizeof(cliaddr);

        printf("Enter the port number you got from Server side:");
        scanf("%ld" ,&port);

        cliaddr.sin_family=AF_INET;
        cliaddr.sin_addr.s_addr=inet_addr("127.0.0.1");
        cliaddr.sin_port=htons(port);
```

```
        printf("\nEnter Ctrl+C to terminate the chat...\n");
        do
        {
                sockfd=socket(AF_INET,SOCK_STREAM,0);
                connect(sockfd,(struct sockaddr *)&cliaddr,len);
                printf("\nYou: ");
                scanf("%s", buff);
                write(sockfd, buff ,sizeof(buff));
                n=read(sockfd,buff ,sizeof(buff));

                buff[n]=0;
                time(&t);
                printf("\n%sServer: %s\n" , ctime(&t), buff);

        }while(1);

        return 0;
}
```

Output

END

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