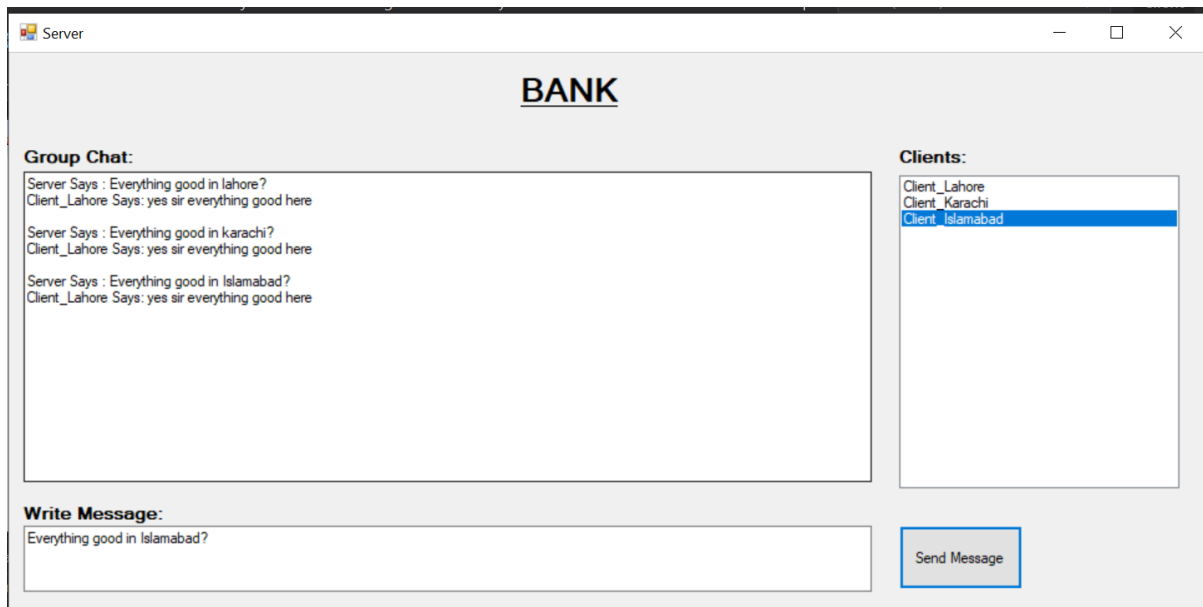


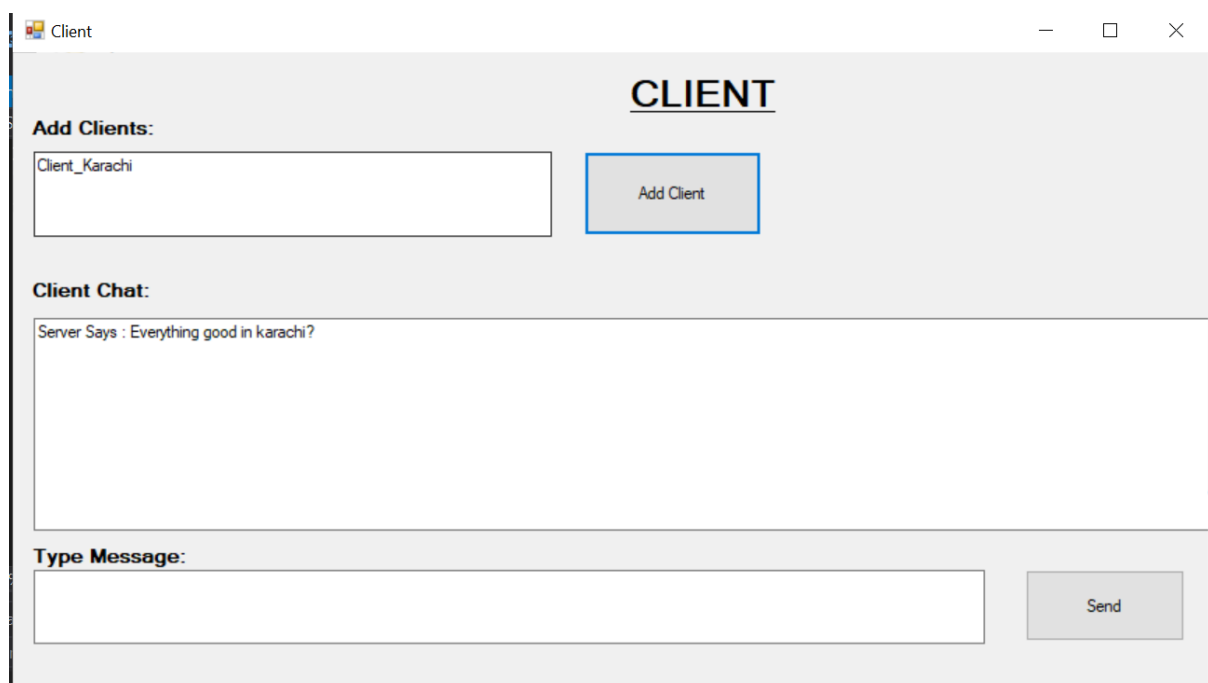
QUESTION NO#03 (A):

SERVER OUTPUT:



The screenshot shows a window titled "Server" with a light gray background. At the top center, the word "BANK" is displayed in a large, bold, black font. Below this, the window is divided into two main sections. On the left, under the heading "Group Chat:", there is a text area containing three lines of chat history: "Server Says : Everything good in lahore?", "Client_Lahore Says: yes sir everything good here", "Server Says : Everything good in karachi?", "Client_Lahore Says: yes sir everything good here", "Server Says : Everything good in Islamabad?", and "Client_Lahore Says: yes sir everything good here". On the right, under the heading "Clients:", there is a list box containing three entries: "Client_Lahore", "Client_Karachi", and "Client_Islamabad", with "Client_Islamabad" selected and highlighted in blue. At the bottom of the window, there is a "Write Message:" section with a text input field containing the text "Everything good in Islamabad?" and a "Send Message" button to its right.

CLIENT OUTPUT:



The screenshot shows a window titled "Client" with a light gray background. At the top center, the word "CLIENT" is displayed in a large, bold, black font. Below this, the window is divided into three main sections. At the top, under the heading "Add Clients:", there is a text input field containing the text "Client_Karachi" and an "Add Client" button to its right. Below this, under the heading "Client Chat:", there is a text area containing one line of chat history: "Server Says : Everything good in karachi?". At the bottom, under the heading "Type Message:", there is a text input field and a "Send" button to its right.

MUHAMMAD UMAR KHAN 10619
THE (TAKE HOME EXAM)
NETWORK PROGRAMMING CID: 108157

Client

CLIENT

Add Clients:

Client_Islamabad

Add Client

Client Chat:

Server Says : Everything good in Islamabad?

Type Message:

Send

Client

CLIENT

Add Clients:

Client_Lahore

Add Client

Client Chat:

Server Says : Everything good in lahore?

Type Message:

yes sir everything good here

Send

SERVER CODE:

```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;
using System.Threading;
using System.Net;
using System.Net.Sockets;
using System.IO;

namespace Server
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }

        private void Form1_Load(object sender, EventArgs e)
        {
            CheckForIllegalCrossThreadCalls = false;
            TcpListener listener = new TcpListener(IPAddress.Loopback, 11000);
            listener.Start(10);
            listener.BeginAcceptTcpClient(new AsyncCallback(ClientConnect),
listener);
        }
        Dictionary<string,TcpClient> lstClients = new
Dictionary<string,TcpClient>();
        byte[] b = new byte[1024];
        private void ClientConnect(IAsyncResult ar)
        {
            TcpListener listener = (TcpListener)ar.AsyncState;
            TcpClient client = listener.EndAcceptTcpClient(ar);
            NetworkStream ns = client.GetStream();
            object[] a = new object[2];
            a[0] = ns;
            a[1] = client;
            ns.BeginRead(b, 0, b.Length, new AsyncCallback(ReadMsg), a);
        }
    }
}
```

MUHAMMAD UMAR KHAN 10619
THE (TAKE HOME EXAM)
NETWORK PROGRAMMING CID: 108157

```
        listener.BeginAcceptTcpClient(new AsyncCallback(ClientConnect),
listener);
    }
    private void ReadMsg(IAsyncResult ar)
    {
        object[] a = (object[])ar.AsyncState;
        NetworkStream ns = (NetworkStream)a[0];
        TcpClient client = (TcpClient)a[1];
        int count = ns.EndRead(ar);
        string msg = ASCIIEncoding.ASCII.GetString(b, 0, count);
        if (msg.Contains("@name@"))
        {
            string name = msg.Replace("@name@", "");
            lstClients.Add(name, client);
            lstbxClients.Items.Add(name);
        }
        else
        {
            txtDisplay.Text += msg + Environment.NewLine;
        }
        ns.BeginRead(b, 0, b.Length, new AsyncCallback(ReadMsg), a);
    }

    private void button1_Click(object sender, EventArgs e)
    {
        TcpClient client =
(TcpClient)lstClients[lstbxClients.SelectedItem.ToString()];
        NetworkStream ns = client.GetStream();
        StreamWriter sw = new StreamWriter(ns);
        string textToSend = "Server Says : " + txtMsg.Text;
        sw.WriteLine(textToSend);
        txtDisplay.Text += textToSend + Environment.NewLine;
        sw.Flush();
    }
}
}
```

CLIENT CODE:

```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;
using System.Threading.Tasks;
using System.Windows.Forms;
using System.Threading;
using System.Net;
using System.Net.Sockets;
using System.IO;

namespace Client
{
    public partial class Form1 : Form
    {
        public Form1()
        {
            InitializeComponent();
        }
        byte[] b = new byte[1024];
        TcpClient client = new TcpClient();

        private void Form1_Load(object sender, EventArgs e)
        {
        }

        private void ReadMsg(IAsyncResult ar)
        {
            NetworkStream ns = (NetworkStream)ar.AsyncState;
            int count = ns.EndRead(ar);
            txtDisplay.Text += ASCIIEncoding.ASCII.GetString(b, 0, count);
            ns.BeginRead(b, 0, b.Length, ReadMsg, ns);
        }

        private void button1_Click(object sender, EventArgs e)
        {

```

MUHAMMAD UMAR KHAN 10619

THE (TAKE HOME EXAM)

NETWORK PROGRAMMING CID: 108157

```
        NetworkStream ns = client.GetStream();
        StreamWriter sw = new StreamWriter(ns);
        sw.WriteLine(txtName.Text + " Says: " + txtMsg.Text);
        sw.Flush();
    }

    private void button2_Click(object sender, EventArgs e)
    {

        CheckForIllegalCrossThreadCalls = false;
        client.Connect(IPAddress.Loopback, 11000);

        NetworkStream ns = client.GetStream();
        StreamWriter sw = new StreamWriter(ns);
        sw.WriteLine("@name@" + txtName.Text);
        sw.Flush();
        ns.BeginRead(b, 0, b.Length, ReadMsg, ns);
    }
}
```