Practical 1

Objective:

A) Write a program to implement the connection oriented echo client server application

Software Environment: Notepad++, jdk1.8

Implementation:

SERVER:

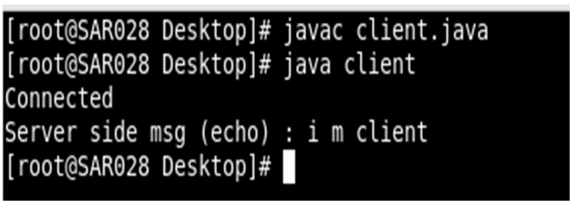
```
import java.io.BufferedInputStream;
import java.io.BufferedOutputStream;
import java.io.DataInputStream;
import java.io.DataOutputStream;
import java.io.IOException;
import java.io.InputStream;
import java.io.OutputStream;
import java.net.ServerSocket;
import java.net.Socket;
import java.net.UnknownHostException;

//Write a program to implement the connection oriented echo
client server application
public class server {

     static Socket socket;
     static ServerSocket serverSocket;
     DataInputStream inputStream;
     DataOutputStream outputStream;

    public server() throws UnknownHostException, IOException{
     serverSocket=new ServerSocket(4523);
     System.out.println("Server is On");

     socket=serverSocket.accept();
     outputStream=new
DataOutputStream(socket.getOutputStream());
          inputStream=new
DataInputStream(socket.getInputStream());


     String msg=inputStream.readUTF();
     //System.out.println(msg);
     outputStream.writeUTF(msg);
     outputStream.flush();
     socket.close();
     serverSocket.close();
}

     public static void main(String[] args) throws
UnknownHostException, IOException {

          server serverClass=new server();
```

```
}}
```

CLIENT:

```
import java.io.BufferedInputStream;
import java.io.BufferedOutputStream;
import java.io.DataInputStream;
import java.io.DataOutputStream;
import java.io.IOException;
import java.io.InputStream;
import java.io.OutputStream;
import java.net.*;

//Write a program to implement the connection oriented echo
client server application
public class client {
     static Socket socket;
     DataInputStream inputStream;
     DataOutputStream outputStream;

     public client() throws IOException{

          socket=new Socket("172.16.1.28",4523);
          System.out.println("Connected");

     outputStream=new
DataOutputStream(socket.getOutputStream());
          inputStream=new
DataInputStream(socket.getInputStream());
          String msg="i m client";
          outputStream.writeUTF(msg);
          String msg2=inputStream.readUTF();
          System.out.println("Server side msg (echo) :
"+msg2);
          socket.close();

     }

     public static void main(String[] args) throws
UnknownHostException, IOException {

          client clientClass=new client();

     }
}
```

OUTPUT:



Objective:

B) Write a program to implement the connection oriented echo client server application

Software Environment: Notepad++, jdk1.8

Implementation:

SERVER:

```
//Server Program for echo application
import java.net.*;
import java.io.*;

public class Server{

     static DatagramSocket socket;
     static DatagramPacket rdp,sdp;

     public static void main(String args[]) throws
IOException{
          System.out.println("Server Started......");
          try{
               socket = new DatagramSocket(4444);
               String str;
               while(socket!=null){
                    rdp = new DatagramPacket(new
byte[512],512);
                    socket.receive(rdp);
                    sdp = new
DatagramPacket(rdp.getData(),rdp.getLength(),rdp.getAddress(),
rdp.getPort());
                    socket.send(sdp);
               }
               socket.close();
          }catch(Exception e){
               e.printStackTrace();
          }
     }}
```

CLIENT:

```
import java.net.*;
import java.io.*;

public class Client{

     static DatagramSocket socket;
     static DatagramPacket sdp,rdp;
     static BufferedReader cl_in;
     static InetAddress address;
     static int port;

     public static void main(String args[]){
          System.out.println("Initiate Communication.....");
          try{
               socket = new DatagramSocket();
```

```
                cl_in = new BufferedReader(new
InputStreamReader(System.in));
                String str1;
                address = InetAddress.getLocalHost();
                port = 4444;
                str1 = cl_in.readLine();
                while(!str1.equalsIgnoreCase("stop")){
                     sdp = new
DatagramPacket(str1.getBytes(),str1.length(),address,port);
                     socket.send(sdp);
                     rdp = new DatagramPacket(new
byte[str1.length()],str1.length());
                     socket.receive(rdp);
                     String str2 = new String(rdp.getData());
                     System.out.println(str2);
                     str1 = cl_in.readLine();
                }
                socket.close();
           }catch(Exception e){
                e.printStackTrace();
           }
     }}
```

Output:

```
C:\Users\hp\Desktop>javac Server.java

C:\Users\hp\Desktop>java Server
Server Started......
```

```
C:\Users\hp\Desktop>javac Client.java

C:\Users\hp\Desktop>java Client
Initiate Communication.....
hello
hello
stop

C:\Users\hp\Desktop>
```

Practical 2

Objective:

A) Develop chat application using either TCP or UDP protocol.

Software Environment: Notepad++, jdk1.8

Implementation:

SERVER:

```
import java.net.*;
import java.io.*;

public class Server{

     static ServerSocket serverSocket;
     static Socket socket;
     static BufferedReader cl_in, ser_in;
     static DataOutputStream ser_out;

     public static void main(String args[]) throws
IOException{
          System.out.println("Server Started......");
          try{
               serverSocket = new ServerSocket(1234);
               socket = serverSocket.accept();
               ser_in = new BufferedReader(new
InputStreamReader(System.in));
               cl_in = new BufferedReader(new
InputStreamReader(socket.getInputStream()));
               ser_out = new
DataOutputStream(socket.getOutputStream());
               String str1,str2;
               str1 = cl_in.readLine();
               while(str1!=null){
                    System.out.println(str1);
                    str2 = ser_in.readLine();
                    ser_out.writeBytes(str2+"\n");
                    str1 = cl_in.readLine();
               }
               socket.close();
               serverSocket.close();
          }catch(Exception e){
               e.printStackTrace();
          }
     }}
```

CLIENT:

```
import java.net.*;
import java.io.*;

public class Client{
     static Socket socket;
     static BufferedReader cl_in, ser_in;
     static DataOutputStream cl_out;
```

```
     public static void main(String args[]){
          System.out.println("Initiate Communication.....");
          try{
               socket = new Socket("127.0.0.1",1234);
               cl_in = new BufferedReader(new
InputStreamReader(System.in));
               ser_in = new BufferedReader(new
InputStreamReader(socket.getInputStream()));
               cl_out = new
DataOutputStream(socket.getOutputStream());
               String str1,str2;
               str1 = cl_in.readLine();
               while(!str1.equalsIgnoreCase("stop")){
                    cl_out.writeBytes(str1+"\n");
                    str2 = ser_in.readLine();
                    System.out.println(str2);
                    str1 = cl_in.readLine();
               }
               socket.close();
          }catch(Exception e){
               e.printStackTrace();
          }
     }}
```

OUTPUT:

```
C:\Users\hp\Desktop\java>javac Server.java

C:\Users\hp\Desktop\java>java Server
Server Started.
hi
hi i m server.
hy i m client
stop

C:\Users\hp\Desktop\java>
```

```
C:\Users\hp\Desktop\java>javac Client.java

C:\Users\hp\Desktop\java>java Client
Commuication started.
hi
hi i m server.
hy i m client
stop
stop

C:\Users\hp\Desktop\java>_
```

Objective:

B) Implement TCP Server for transferring files using Socket and ServerSocket .

Software Environment: Notepad++, jdk1.8

Implementation:

SERVER:

```
import java.net.*;
import java.io.*;

public class Server{

     static ServerSocket serverSocket;
     static Socket socket;
     static BufferedReader cl_in, ser_in;
     static DataOutputStream ser_out;

     public static void main(String args[]) throws
IOException{
          System.out.println("Server Started.");
          FileInputStream in = null;
          try{
               serverSocket = new ServerSocket(1234);
               socket = serverSocket.accept();
               ser_in = new BufferedReader(new
InputStreamReader(System.in));
               cl_in = new BufferedReader(new
InputStreamReader(socket.getInputStream()));
               ser_out = new
DataOutputStream(socket.getOutputStream());
               String str1;
               str1 = cl_in.readLine();
               System.out.println(str1);
               in = new FileInputStream(str1);
               int c;
               ser_out.writeBytes("File Found");
               while((c = in.read())!=-1){
                    ser_out.write(c);
               }
               c=-1;
               ser_out.write(c);
               System.out.println("File transferred
Successfully");
          }catch(SocketException e){
               e.printStackTrace();
          }catch(FileNotFoundException e){
               ser_out.writeBytes("File Not Found");
          }finally{
               socket.close();
               serverSocket.close();
          }
     }
}
```

CLIENT:

```
import java.net.*;
import java.io.*;
public class Client{
     static Socket socket;
     static BufferedReader cl_in, ser_in;
     static DataOutputStream cl_out;
     public static void main(String args[]) throws
IOException{
          System.out.println("Communication started.");
          FileOutputStream out = null;
          try{
               socket = new Socket("PARTH",1234);
               cl_in = new BufferedReader(new
InputStreamReader(System.in));
               ser_in = new BufferedReader(new
InputStreamReader(socket.getInputStream()));
               cl_out = new
DataOutputStream(socket.getOutputStream());
               String str1;
               System.out.print("Enter FileName: ");
               str1 = cl_in.readLine();
               cl_out.writeBytes(str1+"\n");
               out = new FileOutputStream("output.txt");
               int c;
               String str2 = ser_in.readLine();
               if(str2.equals("File Not Found")){
                    System.out.println("File Not Found");
               }else{
                    while((c = ser_in.read())!=-1){
                         out.write(c);
                    }    }
          }catch(SocketException e){
               e.printStackTrace();
          }finally{
               socket.close();
          }}}
```

OUTPUT:

```
C:\Users\hp\Desktop\java>javac Server.java

C:\Users\hp\Desktop\java>java Server
Server Started.
1.txt
File transferred Successfully

C:\Users\hp\Desktop\java>javac Server.java

C:\Users\hp\Desktop\java>java Server
Server Started.
1.txt
File transferred Successfully

C:\Users\hp\Desktop\java>javac Server.java

C:\Users\hp\Desktop\java>java Server
Server Started.
2.txt
```

```
C:\Users\hp\Desktop\java>javac Client.java

C:\Users\hp\Desktop\java>java Client
Communication started.
Enter FileName: 1.txt

C:\Users\hp\Desktop\java>javac Client.java

C:\Users\hp\Desktop\java>java Client
Communication started.
Enter FileName: 2.txt
File Not Found

C:\Users\hp\Desktop\java>
```

Practical 3

Objective:

A) Implement any one sorting algorithm using TCP/UDP on Server application and

Give Input On Client side and client should sorted output from server and display sorted on input side.

Software Environment: Notepad++, jdk1.8

Implementation:

SERVER:

```
import java.net.*;
import java.io.*;
import java.util.*;

public class Server{
     static ServerSocket serverSocket;
     static Socket socket;
     static BufferedReader cl_in, ser_in;
     static DataOutputStream ser_out;
     public static void main(String args[]) throws
IOException{
          System.out.println("Server Started.");
          try{
               serverSocket = new ServerSocket(1234);
               socket = serverSocket.accept();
               ser_in = new BufferedReader(new
InputStreamReader(System.in));
               cl_in = new BufferedReader(new
InputStreamReader(socket.getInputStream()));
               ser_out = new
DataOutputStream(socket.getOutputStream());
               String str1,str2;
               str1 = cl_in.readLine();
               String[] a = str1.split(" ");
               int[] b = new int[a.length];
               for(int i=0;i<a.length;i++){
                    b[i] = Integer.parseInt(a[i]);
               }
               int min;
               for(int i=0;i<b.length;i++){
                    for(int j=i+1;j<b.length;j++){
                         if(b[i]>b[j]){
                              min = b[i];
                              b[i] = b[j];
                              b[j] = min;
                         }
                    }
               }
               String outputstr = Arrays.toString(b);
               ser_out.writeBytes(outputstr);
               socket.close();
               serverSocket.close();
          }catch(Exception e){
               e.printStackTrace();
```

```
          }}}
```

CLIENT:

```
import java.net.*;
import java.io.*;

public class Client{
     static Socket socket;
     static BufferedReader cl_in, ser_in;
     static DataOutputStream cl_out;
     public static void main(String args[]){
          System.out.println("Communication started.");
          try{
               socket = new Socket("PARTH",1234);
               cl_in = new BufferedReader(new
InputStreamReader(System.in));
               ser_in = new BufferedReader(new
InputStreamReader(socket.getInputStream()));
               cl_out = new
DataOutputStream(socket.getOutputStream());
               String str1,str2;
               System.out.println("Enter Array");
               str1 = cl_in.readLine();
               cl_out.writeBytes(str1+"\n");
               str2 = ser_in.readLine();
               System.out.println(str2);
               socket.close();
          }catch(Exception e){
               e.printStackTrace();
          }
     }
}
```

OUTPUT:

```
C:\Users\hp\Desktop\java>javac Server.java

C:\Users\hp\Desktop\java>java Server
Server Started.

C:\Users\hp\Desktop\java>
```

```
C:\Users\hp\Desktop\java>javac Client.java

C:\Users\hp\Desktop\java>java Client
Communication started.
Enter Array
5 15 3 10 2
[2, 3, 5, 10, 15]

C:\Users\hp\Desktop\java>
```

Objective:

B) Implement Concurrent TCP Server programming in which more than one client can

connect and communicate with Server for sending the string and server returns the reverse of string to each of client

Software Environment: Notepad++, jdk1.8

Implementation:

SERVER:

```
import java.net.*;
import java.io.*;

public class Server extends Thread{

     static ServerSocket serverSocket;

     Server() throws IOException{
          serverSocket = new ServerSocket(1234);
     }

     public void run(){
          try{
               while(true){
                    Socket socket = serverSocket.accept();
                    BufferedReader cl_in = new
BufferedReader(new
InputStreamReader(socket.getInputStream()));
                    DataOutputStream ser_out = new
DataOutputStream(socket.getOutputStream());
                    String str1;
                    str1 = cl_in.readLine();
                    System.out.println(str1);
                    StringBuilder str = new StringBuilder();
                    str.append(str1);
                    str = str.reverse();
                    ser_out.writeBytes(str+"\n");
               }
          }catch(SocketException e){
               System.out.println("Socket timed out");
          }catch(IOException e){
               e.printStackTrace();
          }}
     public static void main(String args[]){
          System.out.println("Server Started");
          try{
               Thread t = new Server();
               t.start();
          }catch(IOException e){
               e.printStackTrace();
          }
     }
}
```

CLIENT:

```
import java.net.*;
import java.io.*;

public class Client{
   static Socket socket;
   static BufferedReader cl_in, ser_in;
   static DataOutputStream cl_out;
   public static void main(String args[]){
      System.out.println("Communication started.");
      try{
         socket = new Socket("PARTH",1234);
         cl_in = new BufferedReader(new
InputStreamReader(System.in));
         ser_in = new BufferedReader(new
InputStreamReader(socket.getInputStream()));
         cl_out = new
DataOutputStream(socket.getOutputStream());
         String str1,str2;
         str1 = cl_in.readLine();
         cl_out.writeBytes(str1+"\n");
         str2 = ser_in.readLine();
         System.out.println(str2);
         socket.close();
      }catch(Exception e){
         e.printStackTrace();
      }
   }}
```

OUTPUT:

```
C:\Users\hp\Desktop\java>javac Server.java

C:\Users\hp\Desktop\java>java Server
Server Started
123
456
```

```
C:\Users\hp\Desktop\java>javac Client.java

C:\Users\hp\Desktop\java>java Client
Communication started.
123
321

C:\Users\hp\Desktop\java>
```

```
C:\Users\hp\Desktop\java>javac Client.java

C:\Users\hp\Desktop\java>java Client
Communication started.
456
654

C:\Users\hp\Desktop\java>
```

Practical 4

Objective:

A. write a program which prints the student_name and id_no from the database in reverse order and also insert the two new rows.

Software Environment: Eclipse, jdk1.8

Implementation:

```
import java.sql.*;
public class LoginForm {
     public static void main(String[] args) {
          try{
          Class.forName("com.mysql.jdbc.Driver");
          Connection
con=DriverManager.getConnection("jdbc:mysql://localhost/mysql"
,"root","");
          Statement stmt=con.createStatement();
          String sql="abc",b="comp";
          ResultSet rs=stmt.executeQuery("select * from
student");
          rs.setFetchDirection(ResultSet.FETCH_REVERSE);
          rs.last();
          while(rs.previous())
          {
               System.out.println("Id : "+rs.getString(1)+"
Name : "+rs.getString(2)+"  Spi : "+rs.getString(3));
          }

          }
           catch (ClassNotFoundException e) {
               // TODO Auto-generated catch block
               e.printStackTrace();
          } catch (SQLException e) {
               // TODO Auto-generated catch block
               e.printStackTrace();
          }}}
```

Output:

+ Options

id	name	spi
1	parth	7
2	parth	9.0
3	tejas	10
4	keval	9.6
5	darshit	9.6

```
Id : 4  Name : keval  spi : 9.6
Id : 3  Name : tejas  spi : 10
Id : 2  Name : parth  spi : 9.0
Id : 1  Name : parth  spi : 7
```

Objective:

B. Develop an user interface that perform the following SQL operations :(i) Select (ii) Insert (iii) Update (iv) Delete

Software Environment: Eclipse, jdk1.8

Implementation:

Main.java

```
package database;

import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.sql.*;

public class Main {
	static DBswing swingobj;

	public static Connection makecoonnection() throws ClassNotFoundException,
			SQLException {
		Class.forName("com.mysql.jdbc.Driver"); //for mysql
		Connection con = DriverManager.getConnection(
				"jdbc:mysql://localhost/test", "root", "");
		System.out.println("Connection Established...");
		return con;

	}
   // for oracle s16cos153 student
	public static void action() {
		swingobj.btnshow.addActionListener(new ActionListener() {
			@Override
			public void actionPerformed(ActionEvent e) {
				String select = "select * from student";
				try {
					Connection con = makecoonnection();
					Statement st = con.createStatement();

					ResultSet rs = st.executeQuery(select);

					while (rs.next()) {
						System.out.println(rs.getString(1)+"    "+
rs.getString(2)+"    "
+ rs.getString(3));
					}
				} catch (ClassNotFoundException e1) {
					e1.printStackTrace();
				} catch (SQLException e1) {
					e1.printStackTrace();
				}

			}
		});
		swingobj.btninsert.addActionListener(new ActionListener() {
```

```
                @Override
                public void actionPerformed(ActionEvent e) {
                        String id=swingobj.textid.getText();
                        String name=swingobj.textname.getText();
                        String spi=swingobj.textspi.getText();

                        String insert = "insert into student(id,name,spi)
values(\""+id+"\",\""+name+"\",\""+spi+"\")";
                        try {
                                Connection con = makecoonnection();
                                Statement st = con.createStatement();
                                int val=st.executeUpdate(insert);
                                System.out.println("Successfully Inserted...");

                        } catch (ClassNotFoundException e1) {
                                e1.printStackTrace();
                        } catch (SQLException e1) {
                                e1.printStackTrace();
                        }

                }
        });
        swingobj.btnupdate.addActionListener(new ActionListener() {

                @Override
                public void actionPerformed(ActionEvent e) {
                        String id=swingobj.textid.getText();
                        String name=swingobj.textname.getText();
                        String spi=swingobj.textspi.getText();

                        String update = "UPDATE student SET name =\"" + name +
"\","
                                        + "spi=\"" + spi + "\" WHERE id=\"" + id +
"\"";
                        try {
                                Connection con = makecoonnection();
                                Statement st = con.createStatement();
                                int val=st.executeUpdate(update);
                                System.out.println("Successfully Updated...");

                        } catch (ClassNotFoundException e1) {
                                e1.printStackTrace();
                        } catch (SQLException e1) {
                                e1.printStackTrace();
                        }

                }
        });
        swingobj.btndelete.addActionListener(new ActionListener() {
                @Override
                public void actionPerformed(ActionEvent e) {
                        String id=swingobj.textid.getText();
```

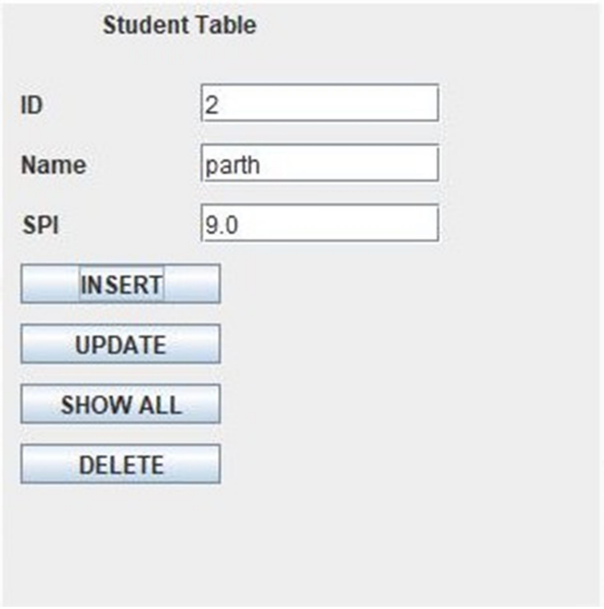
```
                                String name=swingobj.textname.getText();
                                String spi=swingobj.textspi.getText();
                                String delete = "DELETE FROM student WHERE
id=\""+id+"\"";
                                try {
                                        Connection con = makecoonnection();
                                        Statement st = con.createStatement();
                                        int val=st.executeUpdate(delete);
                                        System.out.println("Successfully Deleted...");

                                } catch (ClassNotFoundException e1) {
                                        e1.printStackTrace();
                                } catch (SQLException e1) {
                                        e1.printStackTrace();
                                }}
                        });
        }
        public static void main(String[] args) throws ClassNotFoundException,
                                SQLException {
                        String result;
                        swingobj = new DBswing();
                        action();
        }
}
```

DBswing.java

```
        package database;
        import java.awt.*;
        import java.awt.event.*;
        import javax.swing.*;
        public class DBswing  {
                JFrame mainFrame;
                JLabel title;
                 JLabel id;
                 JLabel name;
                 JLabel spi;
                 JTextField textid;
                 JTextField textname;
                 JTextField textspi;
                 JButton btninsert;
                 JButton btnshow;
                 int flag=0;
                 JButton btnupdate;
                 JButton btndelete;
                public DBswing(){
                        mainFrame = new JFrame("Database");
                        mainFrame.setSize(500,500);
                        mainFrame.setLayout(null);
                        title=new JLabel("Student Table");
                         title.setBounds(50,00,150,20);
                        id=new JLabel("ID");
                        id.setBounds(10,40,100,20);
```

```
                textid=new JTextField("");
                 textid.setBounds(100,40,120,20);
                name=new JLabel("Name");
                name.setBounds(10,70,100,20);
                        textname=new JTextField("");
                 textname.setBounds(100,70,120,20);
                spi=new JLabel("SPI");
                spi.setBounds(10,100,100,20);
                        textspi=new JTextField("");
                 textspi.setBounds(100,100,120,20);

                        btninsert=new JButton("INSERT");
                        btninsert.setBounds(10,130,100,20);
                        btnupdate=new JButton("UPDATE");
                        btnupdate.setBounds(10,160,100,20);
                        btnshow=new JButton("SHOW ALL");
                        btnshow.setBounds(10,190,100,20);
                        btndelete=new JButton("DELETE");
                        btndelete.setBounds(10,220,100,20);

                 mainFrame.add(title);
                 mainFrame.add(id);
                 mainFrame.add(textid);
                 mainFrame.add(name);
                 mainFrame.add(textname);
                 mainFrame.add(spi);
                 mainFrame.add(textspi);
                 mainFrame.add(btninsert);
                 mainFrame.add(btnupdate);
                 mainFrame.add(btnshow);
                 mainFrame.add(btndelete);
                 mainFrame.setVisible(true);
            }
        }
```

Output:




```
Connection Established...
1    parth    7
2    parth    9.0
3    tejas    10
```