



CS330–Computer Networks Project

Client/Server Application

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1-Setting up the Programming Environment

We Decided we are going to use Java language since we have an experience in Java and we've practiced on it before.

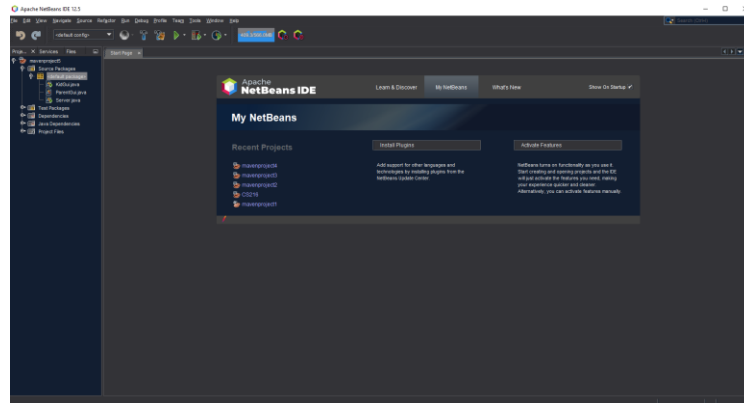
Apache NetBeans is the integrated development environment, Tooling Platform and Application Framework for java that we used for this project with **JDK** library.

- **Environment Installation:**

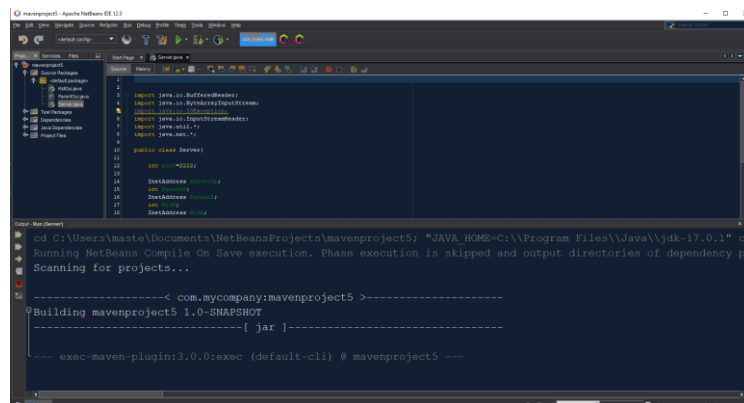
Steps	Description	
JDK Installation	To use NetBeans for java programming we firstly installed Java Development Kit (JDK)	
	Steps	Description
	Download JDK	We went to JDK (Java SE) download site here . Under “Java SE Development Kit 17.0.x downloads”, We selected “Windows” then downloaded the “x64 Installer”.
	Install JDK	We ran the downloaded installer and accepted the defaults and followed the screen instructions to complete the installation.
NetBeans Download	We downloaded NetBeans from here , There are many versions available. For us we downloaded <u>V12.5</u> .	
Installer	We ran the downloaded installer and accepted the defaults and followed the screen instructions to complete the installation.	

- **Compile and Run Steps:**

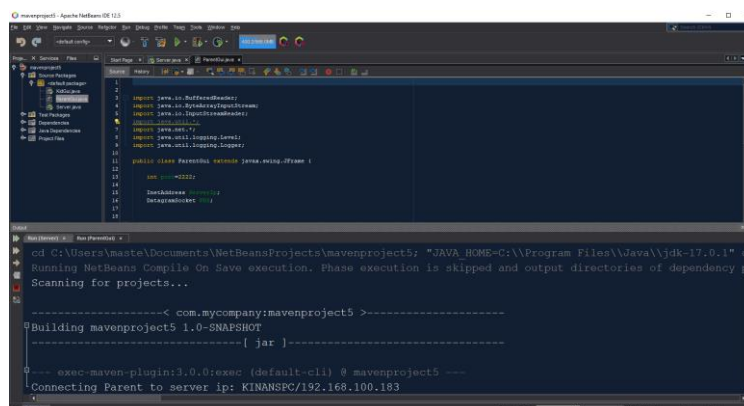
Step 1 : Launch NetBeans IDE With the project codes.

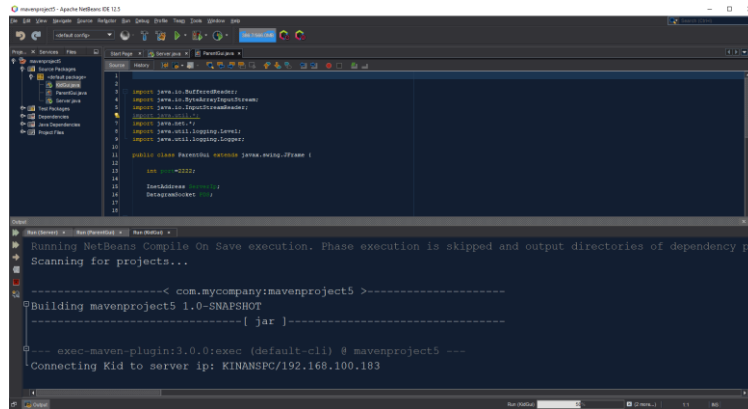


Step 2 : Run The Server Class first



Step 3 : Run the Parent and Kid Class





2-Steps for TCP/UDP socket programming for client-server connection

Steps	Description
1	<p>When we run the server, the server will create a server socket and IP address waiting for parent and kid:</p> <pre>DatagramSocket DS = new DatagramSocket(port); ServerIp=InetAddress.getLocalHost();</pre>
2	<p>The server will be receiving and storing requests:</p> <pre>byte receive[] = new byte[1024]; DatagramPacket DP = new DatagramPacket(receive, receive.length); DS.receive(DP);</pre>
3	<p>Parent and Kid will get a socket and IP address each:</p> <pre>KID: KDS = new DatagramSocket(2222); ServerIp = InetAddress.getLocalHost(); Parent Socket: PDS = new DatagramSocket(2222); ServerIp=InetAddress.getLocalHost();</pre>

3-Steps for setting up the network

We connected two separate hosts wirelessly, Parent and Kid clients were connected using the same IP address and port number.

4- Codes and comments:

Code of server side:

Server's Code
<pre>import java.io.BufferedReader; import java.io.ByteArrayInputStream; import java.io.IOException; import java.io.InputStreamReader; import java.util.*; import java.net.*; public class Server{ int port=2222; InetAddress ServerIp; int ParentP; InetAddress ParentA; int KidP; InetAddress KidA; public Server() throws Exception{ // Create Server IP Address - تجهيز عنوان الخادم ServerIp=InetAddress.getLocalHost(); // Create UDP Server Socket - صنع مقبس من نوع يو دي بي DatagramSocket DS = new DatagramSocket(port); // keep the server running - البقاء الخادم متصلا while(true){ // Create Buffer for receiving request - صنع مخزن مؤقت لاستقبال الطلبات byte receive[] = new byte[1024]; //Create Packet for receiving request - صنع حزمة بيانات لاستقبال الطلبات DatagramPacket DP = new DatagramPacket(receive, receive.length); // receiving requests - استقبال الطلبات DS.receive(DP); // Store received request - تخزين الطلب المستقبل String Request = ReceivedReq(DP); //get Parent info - تخزين معلومات الاب if(Request.trim().equalsIgnoreCase("Parent")){ ParentA = DP.getAddress(); ParentP = DP.getPort(); } // Parent info method finished - نهاية ميثود الاب //get Kid info - تخزين معلومات الابن if(Request.trim().equalsIgnoreCase("Kid")){ KidA = DP.getAddress(); KidP = DP.getPort(); } } } }</pre>

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    }
    // Kid info method finished- نهاية ميثود الابن

    //First request\ Kid Day over - الطلب الاول انتهاء يوم الطفل
    if(Request.trim().equalsIgnoreCase("Day_Over")){

        byte[] SB = new byte[1024];
        String end="DayOver";
        SB = end.getBytes();
        // create datagram packet to Send to parent - صنع حزمة بيانات لارسالها للاب
        DatagramPacket PE = new DatagramPacket(SB, SB.length, ParentA, ParentP);
        DS.send(PE);
    }
    // Kid Day over method finished - نهاية ميثود انتهاء يوم الطفل

    //Second request\ parent call is calling - الطلب الثاني اتصال الاب
    else if(Request.trim().equalsIgnoreCase("Call_Kid")){

        byte[]SB = "im_out".getBytes();
        //create datagram packet to Send to Kid - صنع حزمة بيانات لارسالها للابن
        DatagramPacket KC = new DatagramPacket(SB, SB.length, KidA, KidP);
        DS.send(KC);
    }
    // parent is calling method is finished - انتهاء ميثود اتصال الاب
    }
    // while loop finished - انتهاء لوب الوابل
    }
    // constructor finished - انتهاء الكونستركتر

    // Create method to read the request and print it - صنع ميثود لقراءة الطلبات
    public String ReceivedReq(DatagramPacket DP) throws Exception {

        byte[] buf = DP.getData();
        // create Input Stream reader - صنع ستريم ريدر للدخال
        InputStreamReader ISR = new InputStreamReader(new ByteArrayInputStream(buf));
        // Create Buffer Reader - صنع قارئ البفر
        BufferedReader BR = new BufferedReader(ISR);
        // store it in String - تخزينه في سترينج
        String request = BR.readLine();

        System.out.println("Message from " + DP.getAddress().getHostAddress()+" : " + request);

        return request;
    }
    // ReceivedReq method finished - نهاية ميثود استلام الطلبات

    //MAIN - الكلاس الرئيسي

    public static void main (String[]args) throws Exception{
        // call the server - استدعاء السيرفر
        new Server();
    }
}

```

Code for client side:

Parent's code
import java.io.File;

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import javax.sound.sampled.AudioInputStream;
import javax.sound.sampled.AudioSystem;
import javax.sound.sampled.Clip;
import java.io.BufferedReader;
import java.io.ByteArrayInputStream;
import java.io.InputStreamReader;
import java.net.DatagramSocket;
import java.net.InetAddress;
import java.util.*;
import java.util.logging.Level;
import java.util.logging.Logger;

public class Parent extends javax.swing.JFrame {

    int port=2222;
    //To check if Kid's school is over or not - ليتأكد من انتهاء الطفل
    boolean is_over=false;
    InetAddress ServerIp;
    DatagramSocket PDS;

    public Parent() throws Exception {
        initComponents();
        // Create Parent Socket Using UDP - صنع مقبس للاب باستعمال بروتوكول اليو دي بي
        PDS = new DatagramSocket();

        //Prepare the server ip address - تجهيز العنوان السيرفر
        ServerIp = InetAddress.getLocalHost();

        //Print Connecting message - طباعة رسالة الاتصال
        System.out.println("Connecting Parent to server ip: "+ InetAddress.getLocalHost());

        try{
            // prepare buffer to send to the server - تجهيز مخزن مؤقت لارساله للسيرفر
            String PI ="Parent";
            byte[] SB = new byte[1024];
            SB = PI.getBytes();

            // Create packet to send to server - صنع حزمة بيانات لارسالها للسيرفر
            DatagramPacket PD = new DatagramPacket(SB, SB.length , ServerIp, port);

            // Sending parent request to server - ارسال طلب الاب للسيرفر
            PDS.send(PD);

            StatusLab1.setText("You're Online");

            //waiting for server response - انتظار رد السيرفر

            //Create Thread - انشاء ثريد
            Thread thread =new Thread(){

                // Run to receive request from kid - تشغيل لاستقبال الطلبات من الابن
                public void run(){

                    try{
                        // create packet to receive Kid request - انشاء حزمة بيانات لاستقبال طلبات الابن
                        byte[] receive=new byte[2048];
                        DatagramPacket r =new DatagramPacket(receive,receive.length);
                        //start receiving request - بدء استقبال الطلبات
                        PDS.receive(r);
                        //store received request - حفظ الطلب المستقبلي
                        String AS=ReceivedReq(r);
                    }
                }
            };
        }
    }

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        if(AS.trim().equalsIgnoreCase("DayOver")){
            //Sets that kid's school is over - يسجل ان الطفل انتها
            is_over = true;
            StatusLab2.setText(" ");

            StatusLab1.setText("School is Over");

            File file = new File("Alert.wav");
            AudioInputStream audioStream = AudioSystem.getAudioInputStream(file);
            Clip clip = AudioSystem.getClip();
            clip.open(audioStream);

            clip.start();
        }
        //end try
        catch(Exception e){
            e.printStackTrace();
        }
        //end catch

    //end run

}; //end thread
thread.start();

// end try
catch(Exception e){
    e.printStackTrace(); } //end catch
}

@SuppressWarnings("unchecked")
// <editor-fold defaultstate="collapsed" desc="Generated Code"> //GEN-BEGIN: initComponents
private void initComponents() {

    jPanel3 = new javax.swing.JPanel();
    jPanel9 = new javax.swing.JPanel();
    ParentGui = new javax.swing.JPanel();
    jPanel2 = new javax.swing.JPanel();
    jPanel7 = new javax.swing.JPanel();
    jLabel2 = new javax.swing.JLabel();
    jPanel8 = new javax.swing.JPanel();
    jLabel4 = new javax.swing.JLabel();
    jPanel6 = new javax.swing.JPanel();
    jLabel1 = new javax.swing.JLabel();
    jPanel4 = new javax.swing.JPanel();
    jLabel3 = new javax.swing.JLabel();
    jPanel5 = new javax.swing.JPanel();
    jLabel6 = new javax.swing.JLabel();
    jPanel10 = new javax.swing.JPanel();
    jLabel7 = new javax.swing.JLabel();
    CallKidButton = new javax.swing.JButton();
    jLabel5 = new javax.swing.JLabel();
    jPanel1 = new javax.swing.JPanel();
    StatusLab1 = new javax.swing.JLabel();
    StatusLab2 = new javax.swing.JLabel();

    javax.swing.GroupLayout jPanel3Layout = new javax.swing.GroupLayout(jPanel3);
    jPanel3.setLayout(jPanel3Layout);
    jPanel3Layout.setHorizontalGroup(
        jPanel3Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel3Layout.createSequentialGroup()
                .addGap(0, 100, Short.MAX_VALUE)
            )
    );
    jPanel3Layout.setVerticalGroup(

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        jPanel3Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGap(0, 100, Short.MAX_VALUE)
        );

        javax.swing.GroupLayout jPanel9Layout = new javax.swing.GroupLayout(jPanel9);
        jPanel9.setLayout(jPanel9Layout);
        jPanel9Layout.setHorizontalGroup(
            jPanel9Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                .addGap(0, 100, Short.MAX_VALUE)
        );
        jPanel9Layout.setVerticalGroup(
            jPanel9Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                .addGap(0, 100, Short.MAX_VALUE)
        );

        setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);
        setBackground(new java.awt.Color(255, 255, 255));
        setName("ParentGui"); // NOI18N

        ParentGui.setBackground(new java.awt.Color(204, 204, 204));
        ParentGui.setName("Parent"); // NOI18N

        jPanel2.setBackground(new java.awt.Color(153, 153, 153));
        jPanel2.setBorder(new javax.swing.border.SoftBevelBorder(javax.swing.border.BevelBorder.RAISED));

        jPanel7.setBackground(new java.awt.Color(102, 102, 102));
        jPanel7.setBorder(javax.swing.BorderFactory.createLineBorder(new java.awt.Color(0, 0, 0)));

        jLabel2.setFont(new java.awt.Font("Times New Roman", 1, 14)); // NOI18N
        jLabel2.setText("Parent info");

        jPanel8.setBackground(new java.awt.Color(153, 153, 153));
        jPanel8.setBorder(javax.swing.BorderFactory.createEmptyBorder(1, 1, 1, 1));

        jLabel4.setFont(new java.awt.Font("Times New Roman", 1, 14)); // NOI18N
        jLabel4.setText("Kid info");

        javax.swing.GroupLayout jPanel8Layout = new javax.swing.GroupLayout(jPanel8);
        jPanel8.setLayout(jPanel8Layout);
        jPanel8Layout.setHorizontalGroup(
            jPanel8Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                .addGroup(jPanel8Layout.createSequentialGroup()
                    .addGroup(jPanel8Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                        .add(jPanel8Layout.createSequentialGroup()
                            .addGap(35, 35, 35)
                            .addComponent(jLabel4, javax.swing.GroupLayout.PREFERRED_SIZE, 79,
                                javax.swing.GroupLayout.PREFERRED_SIZE)
                            .addContainerGap(17, Short.MAX_VALUE))
                    )
                );
        jPanel8Layout.setVerticalGroup(
            jPanel8Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                .addGroup(jPanel8Layout.createSequentialGroup()
                    .addGroup(jPanel8Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                        .add(jPanel8Layout.createSequentialGroup()
                            .addContainerGap()
                            .addComponent(jLabel4)
                            .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
                    )
                );

        jPanel6.setBackground(new java.awt.Color(51, 0, 153));
        jPanel6.setBorder(javax.swing.BorderFactory.createEmptyBorder(1, 1, 1, 1));

        jLabel1.setFont(new java.awt.Font("Times New Roman", 1, 14)); // NOI18N
        jLabel1.setText("Pickup kid");

        javax.swing.GroupLayout jPanel6Layout = new javax.swing.GroupLayout(jPanel6);
        jPanel6.setLayout(jPanel6Layout);

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jPanel6Layout.setHorizontalGroup(
    jPanel6Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel6Layout.createSequentialGroup()
            .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
            .addComponent(jLabel1, javax.swing.GroupLayout.PREFERRED_SIZE, 91,
javax.swing.GroupLayout.PREFERRED_SIZE)
            .addContainerGap())
        );
jPanel6Layout.setVerticalGroup(
    jPanel6Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel6Layout.createSequentialGroup()
            .addContainerGap()
            .addComponent(jLabel1, javax.swing.GroupLayout.DEFAULT_SIZE, 27, Short.MAX_VALUE)
            .addContainerGap())
        );

jPanel4.setBackground(new java.awt.Color(153, 153, 153));
jPanel4.setBorder(javax.swing.BorderFactory.createCompoundBorder());

jLabel3.setBackground(new java.awt.Color(102, 102, 102));
jLabel3.setFont(new java.awt.Font("Times New Roman", 1, 14)); // NOI18N
jLabel3.setText("Kid Location");

javax.swing.GroupLayout jPanel4Layout = new javax.swing.GroupLayout(jPanel4);
jPanel4.setLayout(jPanel4Layout);
jPanel4Layout.setHorizontalGroup(
    jPanel4Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel4Layout.createSequentialGroup()
            .addGap(24, 24, 24)
            .addComponent(jLabel3, javax.swing.GroupLayout.PREFERRED_SIZE, 88,
javax.swing.GroupLayout.PREFERRED_SIZE)
            .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
        );
jPanel4Layout.setVerticalGroup(
    jPanel4Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addComponent(jLabel3, javax.swing.GroupLayout.Alignment.TRAILING, javax.swing.GroupLayout.DEFAULT_SIZE,
47, Short.MAX_VALUE)
        );

jPanel5.setBackground(new java.awt.Color(102, 102, 102));
jPanel5.setBorder(javax.swing.BorderFactory.createEmptyBorder(1, 1, 1, 1));

jLabel6.setFont(new java.awt.Font("Times New Roman", 1, 14)); // NOI18N
jLabel6.setText("Settings");

javax.swing.GroupLayout jPanel5Layout = new javax.swing.GroupLayout(jPanel5);
jPanel5.setLayout(jPanel5Layout);
jPanel5Layout.setHorizontalGroup(
    jPanel5Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel5Layout.createSequentialGroup()
            .addGap(0, 0, Short.MAX_VALUE)
            .addComponent(jLabel6, javax.swing.GroupLayout.PREFERRED_SIZE, 98,
javax.swing.GroupLayout.PREFERRED_SIZE))
        );
jPanel5Layout.setVerticalGroup(
    jPanel5Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel5Layout.createSequentialGroup()
            .addContainerGap()
            .addComponent(jLabel6)
            .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
        );

javax.swing.GroupLayout jPanel7Layout = new javax.swing.GroupLayout(jPanel7);

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jPanel7.setLayout(jPanel7Layout);
jPanel7Layout.setHorizontalGroup(
    jPanel7Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addComponent(jPanel8, javax.swing.GroupLayout.Alignment.TRAILING, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        .addComponent(jPanel6, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)
        .addComponent(jPanel5, javax.swing.GroupLayout.Alignment.TRAILING, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        .addComponent(jPanel4, javax.swing.GroupLayout.Alignment.TRAILING, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel7Layout.createSequentialGroup())
        .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        .addComponent(jLabel2, javax.swing.GroupLayout.PREFERRED_SIZE, 83,
javax.swing.GroupLayout.PREFERRED_SIZE)
        .addGap(21, 21, 21)
);
jPanel7Layout.setVerticalGroup(
    jPanel7Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel7Layout.createSequentialGroup())
        .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        .addComponent(jLabel2)
        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
        .addComponent(jPanel8, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
        .addComponent(jPanel6, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
        .addComponent(jPanel4, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
        .addComponent(jPanel5, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
        .addContainerGap()
);

jPanel10.setBackground(new java.awt.Color(204, 204, 204));
jPanel10.setBorder(javax.swing.BorderFactory.createEmptyBorder(1, 1, 1, 1));
jPanel10.setForeground(new java.awt.Color(0, 0, 153));

jLabel7.setFont(new java.awt.Font("Times New Roman", 1, 18)); // NOI18N
jLabel7.setForeground(new java.awt.Color(0, 0, 102));
jLabel7.setText("Parent ");

javax.swing.GroupLayout jPanel10Layout = new javax.swing.GroupLayout(jPanel10);
jPanel10.setLayout(jPanel10Layout);
jPanel10Layout.setHorizontalGroup(
    jPanel10Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel10Layout.createSequentialGroup())
        .addGap(38, 38, 38)
        .addComponent(jLabel7)
        .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
);
jPanel10Layout.setVerticalGroup(
    jPanel10Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel10Layout.createSequentialGroup())
        .addGap(11, 11, 11)
        .addComponent(jLabel7, javax.swing.GroupLayout.DEFAULT_SIZE, 37, Short.MAX_VALUE)
        .addContainerGap()
);

javax.swing.GroupLayout jPanel2Layout = new javax.swing.GroupLayout(jPanel2);

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jPanel2.setLayout(jPanel2Layout);
jPanel2Layout.setHorizontalGroup(
    jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addComponent(jPanel7, javax.swing.GroupLayout.Alignment.TRAILING, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        .addComponent(jPanel10, javax.swing.GroupLayout.Alignment.TRAILING, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
    );
jPanel2Layout.setVerticalGroup(
    jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel2Layout.createSequentialGroup()
            .addComponent(jPanel10, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
            .addGap(18, 18, 18)
            .addComponent(jPanel7, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
            .addContainerGap(34, Short.MAX_VALUE))
    );

CallKidButton.setBackground(new java.awt.Color(102, 153, 255));
CallKidButton.setFont(new java.awt.Font("Times New Roman", 1, 14)); // NOI18N
CallKidButton.setText("Call Kid");
CallKidButton.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        CallKidButtonActionPerformed(evt);
    }
});

jLabel5.setFont(new java.awt.Font("Times New Roman", 1, 18)); // NOI18N
jLabel5.setForeground(new java.awt.Color(0, 0, 0));
jLabel5.setText("Pickup Kid");

StatusLab1.setBackground(new java.awt.Color(255, 255, 255));
StatusLab1.setForeground(new java.awt.Color(0, 0, 0));
StatusLab1.setText(".");

javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);
jPanel1.setLayout(jPanel1Layout);
jPanel1Layout.setHorizontalGroup(
    jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel1Layout.createSequentialGroup()
            .addGap(0, 57, Short.MAX_VALUE)
            .addComponent(StatusLab1, javax.swing.GroupLayout.PREFERRED_SIZE, 170,
javax.swing.GroupLayout.PREFERRED_SIZE))
    );
jPanel1Layout.setVerticalGroup(
    jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel1Layout.createSequentialGroup()
            .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
            .addComponent(StatusLab1)
            .addGap(11, 11, 11))
    );

StatusLab2.setForeground(new java.awt.Color(255, 0, 0));
StatusLab2.setText(".");

javax.swing.GroupLayout ParentGuiLayout = new javax.swing.GroupLayout(ParentGui);
ParentGui.setLayout(ParentGuiLayout);
ParentGuiLayout.setHorizontalGroup(
    ParentGuiLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(ParentGuiLayout.createSequentialGroup()
            .addComponent(jPanel2, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)

```

```

        .addGroup(ParentGuiLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, ParentGuiLayout.createSequentialGroup())
        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
        .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)
        .addContainerGap())
        .addGroup(ParentGuiLayout.createSequentialGroup())
        .addGap(72, 72, 72)
        .addComponent(jLabel5)
        .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
        .addGroup(ParentGuiLayout.createSequentialGroup())
        .addGap(35, 35, 35)
        .addGroup(ParentGuiLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)
        .addComponent(CallKidButton, javax.swing.GroupLayout.DEFAULT_SIZE, 161, Short.MAX_VALUE)
        .addComponent(StatusLab2, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
        .addGap(0, 0, Short.MAX_VALUE))))
    );
    ParentGuiLayout.setVerticalGroup(
        ParentGuiLayout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addComponent(jPanel2, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, ParentGuiLayout.createSequentialGroup())
        .addGap(38, 38, 38)
        .addComponent(jLabel5, javax.swing.GroupLayout.PREFERRED_SIZE, 31,
javax.swing.GroupLayout.PREFERRED_SIZE)
        .addGap(18, 18, 18)
        .addComponent(jPanel1, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
        .addGap(18, 18, 18)
        .addComponent(StatusLab2)
        .addGap(36, 36, 36)
        .addComponent(CallKidButton, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE)
        .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
    );

    javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());
    getContentPane().setLayout(layout);
    layout.setHorizontalGroup(
        layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addComponent(ParentGui, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
    );
    layout.setVerticalGroup(
        layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addComponent(ParentGui, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
    );

    pack();
} // </editor-fold> // GEN-END: initComponents

private void CallKidButtonActionPerformed(java.awt.event.ActionEvent evt) { // GEN-
FIRST:event_CallKidButtonActionPerformed

    try{
    if(is_over==true){
    // prepare buffer to send to the server - تجهيز مخزن مؤقت لارساله للسيفر
    String CallR ="Call_Kid";
    byte[] SB = new byte[1024];
    SB = CallR.getBytes();

```

```

// Create packet to send to server - صنع حزمة بيانات لارسالها للسيفر
DatagramPacket PC = new DatagramPacket(SB, SB.length, ServerIp, port);

// Sending parent request to server - ارسال طلب الاب للسيفر
PDS.send(PC);

// Change the label - تعديل الرسالة
StatusLab1.setText("Calling Kid");
//Sets that kid's school is over - يسجل ان الطفل انها
is_over = true;
StatusLab2.setText(" ");

}else{
StatusLab2.setText("**School is not Over yet**");
}
}catch(Exception e){
e.printStackTrace();}
}
//GEN-LAST:event_CallKidButtonActionPerformed
// Create method to read the request and print it - صنع ميثود لقراءة الطلبات وطباعتها
public String ReceivedReq(DatagramPacket DP) throws Exception {

byte[] buf = DP.getData();
// create Input Stream reader - صنع ستريم ريدير للادخال
InputStreamReader ISR = new InputStreamReader(new ByteArrayInputStream(buf));
// Create Buffer Reader - صنع قارئ البفر
BufferedReader BR = new BufferedReader(ISR);
// store it in String - تخزينه في سترينج
String request = BR.readLine();

System.out.println("Message from " + DP.getAddress().getHostAddress()+" : " + request);

return request;

}
// ReceivedReq method finished - نهاية ميثود استلام الطلبات
/**
 * @param args the command line arguments
 */
public static void main(String args[]) {
/* Set the Nimbus look and feel */
//<editor-fold defaultstate="collapsed" desc=" Look and feel setting code (optional) ">
/* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and feel.
 * For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html
 */
try {
for (javax.swing.UIManager.LookAndFeelInfo info : javax.swing.UIManager.getInstalledLookAndFeels()) {
if ("Nimbus".equals(info.getName())) {
javax.swing.UIManager.setLookAndFeel(info.getClassName());
break;
}
}
} catch (ClassNotFoundException ex) {
java.util.logging.Logger.getLogger(Parent.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
} catch (InstantiationException ex) {
java.util.logging.Logger.getLogger(Parent.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
} catch (IllegalAccessException ex) {
java.util.logging.Logger.getLogger(Parent.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
} catch (javax.swing.UnsupportedLookAndFeelException ex) {
java.util.logging.Logger.getLogger(Parent.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
}
}
//</editor-fold>

/* Create and display the form */
java.awt.EventQueue.invokeLater(new Runnable() {

```

```

    public void run() {
        try {
            new Parent().setVisible(true);
        } catch (Exception ex) {
            Logger.getLogger(Parent.class.getName()).log(Level.SEVERE, null, ex);
        }
    }
});
}

// Variables declaration - do not modify//GEN-BEGIN:variables
private javax.swing.JButton CallKidButton;
private javax.swing.JPanel ParentGui;
private javax.swing.JLabel StatusLab1;
private javax.swing.JLabel StatusLab2;
private javax.swing.JLabel jLabel1;
private javax.swing.JLabel jLabel2;
private javax.swing.JLabel jLabel3;
private javax.swing.JLabel jLabel4;
private javax.swing.JLabel jLabel5;
private javax.swing.JLabel jLabel6;
private javax.swing.JLabel jLabel7;
private javax.swing.JPanel jPanel1;
private javax.swing.JPanel jPanel10;
private javax.swing.JPanel jPanel2;
private javax.swing.JPanel jPanel3;
private javax.swing.JPanel jPanel4;
private javax.swing.JPanel jPanel5;
private javax.swing.JPanel jPanel6;
private javax.swing.JPanel jPanel7;
private javax.swing.JPanel jPanel8;
private javax.swing.JPanel jPanel9;
// End of variables declaration//GEN-END:variables
}

```

Kid's Code

```

import java.io.File;
import javax.sound.sampled.AudioInputStream;
import javax.sound.sampled.AudioSystem;
import javax.sound.sampled.Clip;
import java.io.BufferedReader;
import java.io.ByteArrayInputStream;
import java.io.InputStreamReader;
import java.net.DatagramSocket;
import java.net.InetAddress;
import java.util.*;
import java.net.*;
import java.util.logging.Level;
import java.util.logging.Logger;

public class Kid extends javax.swing.JFrame {

    InetAddress ServerIp;
    DatagramSocket KDS;
    int port=2222;

    public Kid() throws Exception {
        initComponents();

        // Create kid Socket Using UDP - صنع مقبس للابن باستعمال بروتوكول اليو دي بي

```

```

KDS = new DatagramSocket();

//Prepare the server ip address - تجهيز العنوان السيرفر
ServerIp=InetAddress.getLocalHost();

//Print Connecting message - طباعة رسالة الاتصال
System.out.println("Connecting Kid to server ip: "+ InetAddress.getLocalHost());

    try{
// prepare buffer to send to the server - تجهيز مخزن مؤقت لارساله للسيرفر
String KI ="Kid";
byte[] SB = new byte[1024];
SB = KI.getBytes();

// Create packet to send to server - صنع حزمة بيانات لارسالها للسيرفر
DatagramPacket KD = new DatagramPacket(SB, SB.length , ServerIp, port);

// Sending parent request to server - ارسال طلب الاب للسيرفر
KDS.send(KD);

StatusLab1.setText("You're Online");

    }

    }

}

/**
 * This method is called from within the constructor to initialize the form.
 * WARNING: Do NOT modify this code. The content of this method is always
 * regenerated by the Form Editor.
 */
@SuppressWarnings("unchecked")
// <editor-fold defaultstate="collapsed" desc="Generated Code"> //GEN-BEGIN: initComponents
private void initComponents() {

    jPanel1 = new javax.swing.JPanel();
    jPanel2 = new javax.swing.JPanel();
    jPanel4 = new javax.swing.JPanel();
    jLabel3 = new javax.swing.JLabel();
    jPanel6 = new javax.swing.JPanel();
    jLabel1 = new javax.swing.JLabel();
    jPanel7 = new javax.swing.JPanel();
    jLabel2 = new javax.swing.JLabel();
    jPanel8 = new javax.swing.JPanel();
    jLabel4 = new javax.swing.JLabel();
    jPanel5 = new javax.swing.JPanel();
    jLabel6 = new javax.swing.JLabel();
    jPanel10 = new javax.swing.JPanel();
    jLabel7 = new javax.swing.JLabel();
    DayOverButton = new javax.swing.JButton();
    jLabel5 = new javax.swing.JLabel();
    jPanel3 = new javax.swing.JPanel();
    StatusLab1 = new javax.swing.JLabel();

    setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

    jPanel1.setBackground(new java.awt.Color(204, 204, 204));

```



```

jPanel2.setBackground(new java.awt.Color(153, 153, 153));
jPanel2.setBorder(new javax.swing.border.SoftBevelBorder(javax.swing.border.BevelBorder.RAISED));

jPanel4.setBorder(javax.swing.BorderFactory.createBevelBorder(javax.swing.border.BevelBorder.RAISED));

jLabel3.setFont(new java.awt.Font("Times New Roman", 1, 14)); // NOI18N
jLabel3.setText("Parent Location");

javax.swing.GroupLayout jPanel4Layout = new javax.swing.GroupLayout(jPanel4);
jPanel4.setLayout(jPanel4Layout);
jPanel4Layout.setHorizontalGroup(
    jPanel4Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel4Layout.createSequentialGroup()
            .addGap(10, 10, 10)
            .addComponent(jLabel3)
            .addGap(10, 10, 10))
);
jPanel4Layout.setVerticalGroup(
    jPanel4Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel4Layout.createSequentialGroup()
            .addGap(10, 10, 10)
            .addComponent(jLabel3)
            .addGap(10, 10, 10))
);

jPanel6.setBackground(new java.awt.Color(102, 0, 0));
jPanel6.setBorder(javax.swing.BorderFactory.createBevelBorder(javax.swing.border.BevelBorder.RAISED));

jLabel1.setFont(new java.awt.Font("Times New Roman", 1, 14)); // NOI18N
jLabel1.setText("Notify Parent");

javax.swing.GroupLayout jPanel6Layout = new javax.swing.GroupLayout(jPanel6);
jPanel6.setLayout(jPanel6Layout);
jPanel6Layout.setHorizontalGroup(
    jPanel6Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel6Layout.createSequentialGroup()
            .addGap(10, 10, 10)
            .addComponent(jLabel1)
            .addGap(10, 10, 10))
);
jPanel6Layout.setVerticalGroup(
    jPanel6Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel6Layout.createSequentialGroup()
            .addGap(10, 10, 10)
            .addComponent(jLabel1)
            .addGap(10, 10, 10))
);

jPanel7.setBackground(new java.awt.Color(102, 102, 102));
jPanel7.setBorder(javax.swing.BorderFactory.createBevelBorder(javax.swing.border.BevelBorder.RAISED));

jLabel2.setFont(new java.awt.Font("Times New Roman", 1, 14)); // NOI18N
jLabel2.setText("Parent info");

javax.swing.GroupLayout jPanel7Layout = new javax.swing.GroupLayout(jPanel7);
jPanel7.setLayout(jPanel7Layout);
jPanel7Layout.setHorizontalGroup(
    jPanel7Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel7Layout.createSequentialGroup()
            .addGap(10, 10, 10)
            .addComponent(jLabel2)
            .addGap(10, 10, 10))
);
jPanel7Layout.setVerticalGroup(
    jPanel7Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel7Layout.createSequentialGroup()
            .addGap(10, 10, 10)
            .addComponent(jLabel2)
            .addGap(10, 10, 10))
);

```

```

jPanel8.setBorder(javax.swing.BorderFactory.createBevelBorder(javax.swing.border.BevelBorder.RAISED));

jLabel4.setFont(new java.awt.Font("Times New Roman", 1, 14)); // NOI18N
jLabel4.setText("Kid info");

javax.swing.GroupLayout jPanel8Layout = new javax.swing.GroupLayout(jPanel8);
jPanel8.setLayout(jPanel8Layout);
jPanel8Layout.setHorizontalGroup(
    jPanel8Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel8Layout.createSequentialGroup()
            .addGap(0, 0, Short.MAX_VALUE)
            .addComponent(jLabel4, javax.swing.GroupLayout.PREFERRED_SIZE, 102,
javax.swing.GroupLayout.PREFERRED_SIZE))
        );
jPanel8Layout.setVerticalGroup(
    jPanel8Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel8Layout.createSequentialGroup()
            .addComponent(jLabel4, javax.swing.GroupLayout.DEFAULT_SIZE,
41, Short.MAX_VALUE)
        );

jPanel5.setBackground(new java.awt.Color(102, 102, 102));
jPanel5.setBorder(javax.swing.BorderFactory.createBevelBorder(javax.swing.border.BevelBorder.RAISED));

jLabel6.setFont(new java.awt.Font("Times New Roman", 1, 14)); // NOI18N
jLabel6.setText("Settings");

javax.swing.GroupLayout jPanel5Layout = new javax.swing.GroupLayout(jPanel5);
jPanel5.setLayout(jPanel5Layout);
jPanel5Layout.setHorizontalGroup(
    jPanel5Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel5Layout.createSequentialGroup()
            .addGap(0, 0, Short.MAX_VALUE)
            .addComponent(jLabel6, javax.swing.GroupLayout.PREFERRED_SIZE, 97,
javax.swing.GroupLayout.PREFERRED_SIZE))
        );
jPanel5Layout.setVerticalGroup(
    jPanel5Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel5Layout.createSequentialGroup()
            .addComponent(jLabel6, javax.swing.GroupLayout.DEFAULT_SIZE, 41, Short.MAX_VALUE)
        );

jPanel10.setBackground(new java.awt.Color(204, 204, 204));
jPanel10.setBorder(new javax.swing.border.MatteBorder(null));
jPanel10.setInheritsPopupMenu(true);

jLabel7.setFont(new java.awt.Font("Times New Roman", 1, 18)); // NOI18N
jLabel7.setForeground(new java.awt.Color(102, 0, 0));
jLabel7.setText("Kid ");

javax.swing.GroupLayout jPanel10Layout = new javax.swing.GroupLayout(jPanel10);
jPanel10.setLayout(jPanel10Layout);
jPanel10Layout.setHorizontalGroup(
    jPanel10Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel10Layout.createSequentialGroup()
            .addGap(41, 41, 41)
            .addComponent(jLabel7)
            .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
        );
jPanel10Layout.setVerticalGroup(
    jPanel10Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel10Layout.createSequentialGroup()
            .addGap(11, 11, 11)
            .addComponent(jLabel7, javax.swing.GroupLayout.DEFAULT_SIZE, 37, Short.MAX_VALUE)

```

```

        .addContainerGap())
    );

    javax.swing.GroupLayout jPanel2Layout = new javax.swing.GroupLayout(jPanel2);
    jPanel2.setLayout(jPanel2Layout);
    jPanel2Layout.setHorizontalGroup(
        jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addComponent(jPanel4, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)
            .addComponent(jPanel7, javax.swing.GroupLayout.Alignment.TRAILING, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
            .addComponent(jPanel6, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)
            .addComponent(jPanel8, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)
            .addComponent(jPanel5, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)
            .addComponent(jPanel10, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)
    );
    jPanel2Layout.setVerticalGroup(
        jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel2Layout.createSequentialGroup()
                .addComponent(jPanel10, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                .addGap(18, 18, 18)
                .addComponent(jPanel7, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                .addComponent(jPanel8, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                .addGap(12, 12, 12)
                .addComponent(jPanel6, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                .addComponent(jPanel4, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                .addComponent(jPanel5, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
    );

    DayOverButton.setBackground(new java.awt.Color(255, 51, 51));
    DayOverButton.setFont(new java.awt.Font("Times New Roman", 1, 14)); // NOI18N
    DayOverButton.setText("Call Parent");
    DayOverButton.addActionListener(new java.awt.event.ActionListener() {
        public void actionPerformed(java.awt.event.ActionEvent evt) {
            DayOverButtonActionPerformed(evt);
        }
    });

    jLabel5.setFont(new java.awt.Font("Times New Roman", 1, 18)); // NOI18N
    jLabel5.setForeground(new java.awt.Color(0, 0, 0));
    jLabel5.setText("Notify Parent");

    StatusLab1.setText(".");

    javax.swing.GroupLayout jPanel3Layout = new javax.swing.GroupLayout(jPanel3);
    jPanel3.setLayout(jPanel3Layout);
    jPanel3Layout.setHorizontalGroup(
        jPanel3Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel3Layout.createSequentialGroup()
                .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel3Layout.createSequentialGroup()

```

```

        .addContainerGap(58, Short.MAX_VALUE)
        .addComponent(StatusLab1, javax.swing.GroupLayout.PREFERRED_SIZE, 157,
javax.swing.GroupLayout.PREFERRED_SIZE)
        .addContainerGap());
    };
    jPanel3Layout.setVerticalGroup(
        jPanel3Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel3Layout.createSequentialGroup())
        .addContainerGap()
        .addComponent(StatusLab1)
        .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
    );

    javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);
    jPanel1.setLayout(jPanel1Layout);
    jPanel1Layout.setHorizontalGroup(
        jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel1Layout.createSequentialGroup())
        .addComponent(jPanel2, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
        .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel1Layout.createSequentialGroup())
        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
        .addComponent(jPanel3, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE))
        .addGroup(jPanel1Layout.createSequentialGroup())
        .addGroup(jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel1Layout.createSequentialGroup())
        .addGap(72, 72, 72)
        .addComponent(jLabel5))
        .addGroup(jPanel1Layout.createSequentialGroup())
        .addGap(65, 65, 65)
        .addComponent(DayOverButton, javax.swing.GroupLayout.PREFERRED_SIZE, 119,
javax.swing.GroupLayout.PREFERRED_SIZE)))
        .addGap(0, 0, Short.MAX_VALUE))
        .addContainerGap());
    };
    jPanel1Layout.setVerticalGroup(
        jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addComponent(jPanel2, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING, jPanel1Layout.createSequentialGroup())
        .addGap(38, 38, 38)
        .addComponent(jLabel5, javax.swing.GroupLayout.PREFERRED_SIZE, 31,
javax.swing.GroupLayout.PREFERRED_SIZE)
        .addGap(18, 18, 18)
        .addComponent(jPanel3, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
        .addGap(45, 45, 45)
        .addComponent(DayOverButton, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE)
        .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
    );

    javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());
    getContentPane().setLayout(layout);
    layout.setHorizontalGroup(
        layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addComponent(jPanel1, javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
    );
    layout.setVerticalGroup(
        layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

```

```

        .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)
    );

    pack();
} // </editor-fold> // GEN-END: initComponents

private void DayOverButtonActionPerformed(java.awt.event.ActionEvent evt) { // GEN-
FIRST:event_DayOverButtonActionPerformed

    try{
        // Change the label - تعديل الرسالة
        StatusLab1.setText("Waiting for Parent");

// prepare buffer to send to the server - تجهيز مخزن مؤقت لارساله للسيرفر
        String end="Day_Over";
        byte[] SB = new byte[1024];
        SB = end.getBytes();

// Create packet to send to server - صنع حزمة بيانات لارسالها للسيرفر
        DatagramPacket KSP = new DatagramPacket(SB, SB.length , ServerIp, port);

// Sending kid request to server - ارسال طلب الابن للسيرفر
        KDS.send(KSP);

//waiting for server response - انتظار رد السيرفر

//Create Thread - انشاء ثريد
        Thread t =new Thread(){

// Run to receive request from parent - تشغيل لاستقبال الطلبات من الاب
        public void run(){

            try{
// create packet to receive parent call - انشاء حزمة بيانات لاستقبال اتصال الاب
                byte[] receive=new byte[1024];
                DatagramPacket r =new DatagramPacket(receive,receive.length);
//start receiving calls - بدء استقبال الطلبات
                KDS.receive(r);
//store received request - حفظ الطلب المستقبلي
                String Call=ReceivedReq(r);
// First Response : im_out - الرد الاول انا في الخارج
                if(Call.trim().equalsIgnoreCase("im_out")){

                    StatusLab1.setText("Parent Arrived");
// prepare Sound - تجهيز المقطع الصوتي
                    File file = new File("Alert.wav");
                    AudioInputStream audioStream = AudioSystem.getAudioInputStream(file);
                    Clip clip = AudioSystem.getClip();
                    clip.open(audioStream);

                    clip.start();
//im_out method finished - انتهاء ميثود انا في الخارج

                } //end try
                catch(Exception e){
                    e.printStackTrace();
                } //end catch

//end run - انتهاء التشغيل

            } //end thread
        }
    }
}

```

```

t.start();

// end try
catch(Exception e){
e.printStackTrace(); }//end catch

//GEN-LAST:event_DayOverButtonActionPerformed
// Create method to read the request and print it - صنع ميثود لقراءة الطلبات وطباعتها
public String ReceivedReq(DatagramPacket DP) throws Exception {

    byte[] buf = DP.getData();
    // create Input Stream reader - صنع ستريم ريدر للادخال
    InputStreamReader ISR = new InputStreamReader(new ByteArrayInputStream(buf));
    // Create Buffer Reader - صنع قارئ البفر
    BufferedReader BR = new BufferedReader(ISR);
    // store it in String - تخزينه في سترينج
    String request = BR.readLine();

    System.out.println("Message from " + DP.getAddress().getHostAddress() + ": " + request);

    return request;

} // ReceivedReq method finished - نهاية ميثود استلام الطلبات
/**
 * @param args the command line arguments
 */
public static void main(String args[]) {
    /* Set the Nimbus look and feel */
    //<editor-fold defaultstate="collapsed" desc=" Look and feel setting code (optional) ">
    /* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and feel.
     * For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html
     */
    try {
        for (javax.swing.UIManager.LookAndFeelInfo info : javax.swing.UIManager.getInstalledLookAndFeels()) {
            if ("Nimbus".equals(info.getName())) {
                javax.swing.UIManager.setLookAndFeel(info.getClassName());
                break;
            }
        }
    } catch (ClassNotFoundException ex) {
        java.util.logging.Logger.getLogger(Kid.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
    } catch (InstantiationException ex) {
        java.util.logging.Logger.getLogger(Kid.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
    } catch (IllegalAccessException ex) {
        java.util.logging.Logger.getLogger(Kid.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
    } catch (javax.swing.UnsupportedLookAndFeelException ex) {
        java.util.logging.Logger.getLogger(Kid.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
    }
    //</editor-fold>

    /* Create and display the form */
    java.awt.EventQueue.invokeLater(new Runnable() {
        public void run() {
            try {
                new Kid().setVisible(true);
            } catch (Exception ex) {
                Logger.getLogger(Kid.class.getName()).log(Level.SEVERE, null, ex);
            }
        }
    });
}

```

```

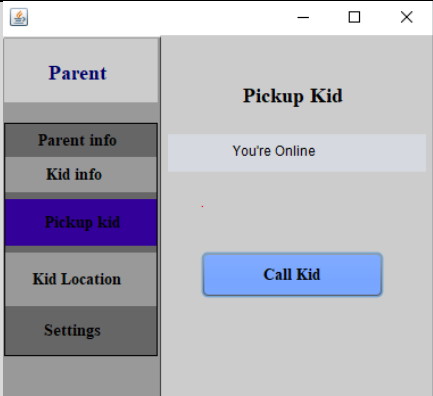
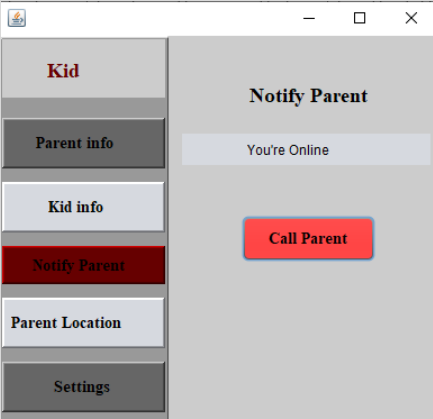
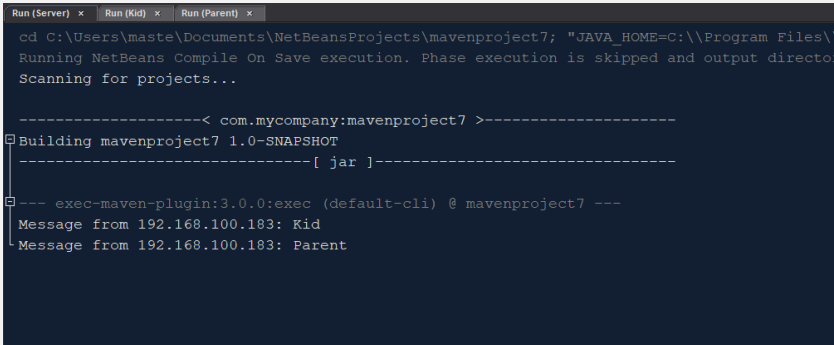
    });
}

// Variables declaration - do not modify//GEN-BEGIN:variables
private javax.swing.JButton DayOverButton;
private javax.swing.JLabel StatusLab1;
private javax.swing.JLabel jLabel1;
private javax.swing.JLabel jLabel2;
private javax.swing.JLabel jLabel3;
private javax.swing.JLabel jLabel4;
private javax.swing.JLabel jLabel5;
private javax.swing.JLabel jLabel6;
private javax.swing.JLabel jLabel7;
private javax.swing.JPanel jPanel1;
private javax.swing.JPanel jPanel10;
private javax.swing.JPanel jPanel2;
private javax.swing.JPanel jPanel3;
private javax.swing.JPanel jPanel4;
private javax.swing.JPanel jPanel5;
private javax.swing.JPanel jPanel6;
private javax.swing.JPanel jPanel7;
private javax.swing.JPanel jPanel8;
// End of variables declaration//GEN-END:variables
}

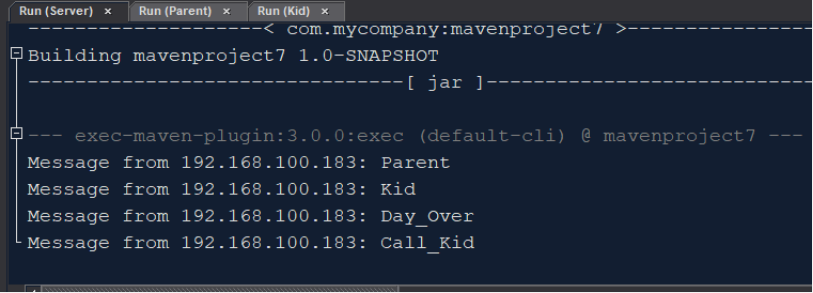
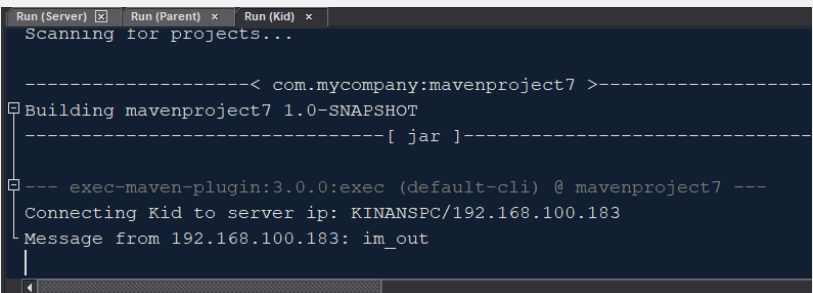
```

5- Snapshots of the application outputs:



<p>Parent GUI:</p>	
<p>Kid GUI:</p>	
<p>Server (Clients Connected):</p>	
	

Kid's School is Over	
Kid (Sends)	<pre>// prepare buffer to send to the server - تجهيز مخزن مؤقت لإرساله للسيرفر String end="Day_Over"; byte[] SB = new byte[1024]; SB = end.getBytes(); // Create packet to send to server - صنع حزمة بيانات لإرسالها للسيرفر DatagramPacket KSP = new DatagramPacket(SB, SB.length, ServerIp, port); // Sending kid request to server - إرسال طلب الابن للسيرفر KDS.send(KSP);</pre>
Server (Receives & Sends)	 <pre>Run (Server) x Run (Parent) x Run (Kid) x -----< com.mycompany:mavenproject7 >----- [Building mavenproject7 1.0-SNAPSHOT] -----[jar]----- --- exec-maven-plugin:3.0.0:exec (default-cli) @ mavenproject7 --- Message from 192.168.100.183: Parent Message from 192.168.100.183: Kid Message from 192.168.100.183: Day_Over</pre>
Parent (Receives)	 <pre>Run (Server) x Run (Parent) x Run (Kid) x Scanning for projects... -----< com.mycompany:mavenproject7 >----- [Building mavenproject7 1.0-SNAPSHOT] -----[jar]----- --- exec-maven-plugin:3.0.0:exec (default-cli) @ mavenproject7 --- Connecting Parent to server ip: KINANSPC/192.168.100.183 Message from 192.168.100.183: DayOver</pre>
Parent Calls Kid	
Parent (Sends)	<pre>// prepare buffer to send to the server - تجهيز مخزن مؤقت لإرساله للسيرفر String CallR="Call_Kid"; byte[] SB = new byte[1024]; SB = CallR.getBytes(); // Create packet to send to server - صنع حزمة بيانات لإرسالها للسيرفر DatagramPacket PC = new DatagramPacket(SB, SB.length, ServerIp, port); // Sending parent request to server - إرسال طلب الاب للسيرفر PDS.send(PC);</pre>

<p align="center">Server (Receives & Sends)</p>	
<p align="center">Kid (Receives)</p>	

6- Transport Protocol :

We used UDP transport protocol because it is easier for the beginners like us and it has some advantages like speed and no congestion control, but mainly because it is easier than TCP transport protocol.

7- Message Structure:

Each message is 1024 byte.

Messages		
Sent	Server	Received
Kid sends: Day_over	Server sends: Im_out	Parent receives: DayOver
Parent sends: Call_kid	Server sends: DayOver	Kid receives: Im_out

8- Testing Environment:

The program was tested on two programming environment **NetBeans** and **VS Studios**.

9- Deployment Process:



10- Cost and Stability:

Cost:

We will assume:

Devices	Cost
Desktop1	1500 SR
Desktop2	1500 SR
Server	300 SR
Total Price	3300 SR

Stability:

The application ran on two programming environments and two computer.

11- Problems and solutions:

Problem 1: Time management.

Solution: Crunch in work.

Problem 2: We didn't have knowledge about socket programming.

Solution: Practice and research.

Problem 3: Connection over network.

Solution: Firewall and antivirus disabled.

Problem 4: Uncompilable code because of the IP address.

Solution: Used InetAddress.getLocalHost() method.

Problem 5: Receiving kid and parent information.

Solution: Added checkmark to start receiving the information.

Problem 5: Sound implementation

Solution: Coded the right path of the .maw file.

References:

References	
1	harmash.com
2	Youtube Link
3	stackoverflow.com
4	Youtube Link2
5	Youtube Link3
6	Youtube Link4
7	Youtube Link5
8	codejava.net
9	Stackoverflow.com (2)
10	Youtube Link6
11	Youtube Link7