



## HƯỚNG DẪN KẾT NỐI APP VỚI BLUETOOTH

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## □ Bước 1: Cấp quyền AndroidManifest.xml

```
<!--Cấp quyền Bluetooth-->
```

```
<uses-permission android:name="android.permission.BLUETOOTH" />
```

```
<uses-permission android:name="android.permission.BLUETOOTH_ADMIN" />
```

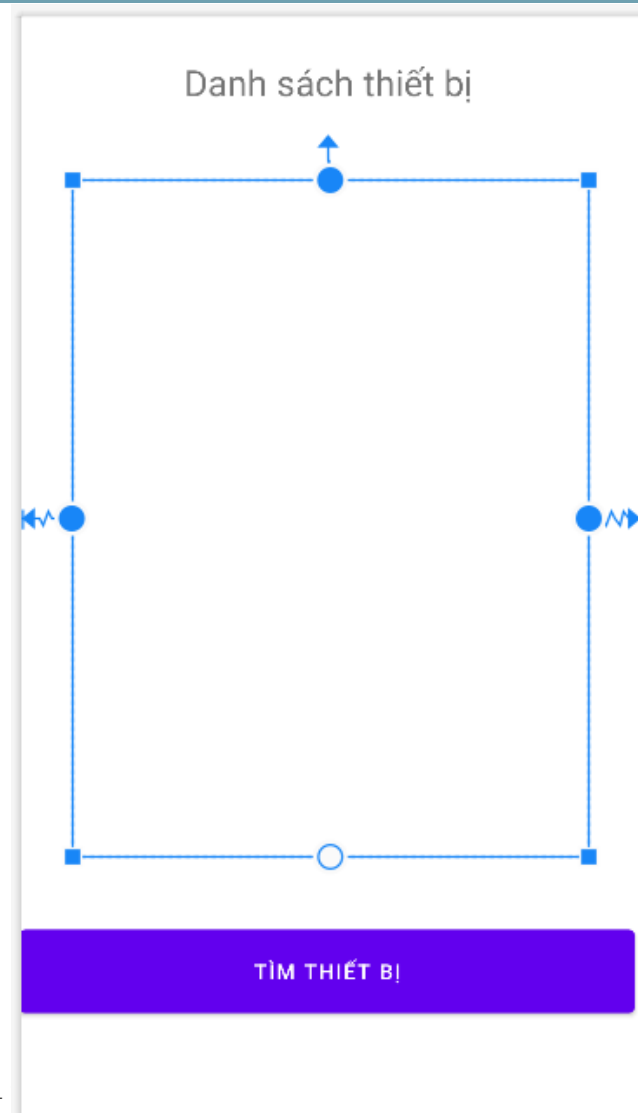
```
<uses-permission android:name="android.permission.BLUETOOTH_CONNECT" />
```

```
<uses-permission android:name="android.permission.BLUETOOTH_SCAN" />
```

Thư viện hình lấy trên khóa học

## □ Bước 1: Xây dựng Giao Diện activity\_main.xml

```
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">
    <TextView
        android:id="@+id/textView2"
        android:layout_width="404dp"
        android:layout_height="51dp"
        android:text="Danh sách thiết bị"
        android:textAlignment="center"
        android:textSize="24sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.285"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.039" />
```

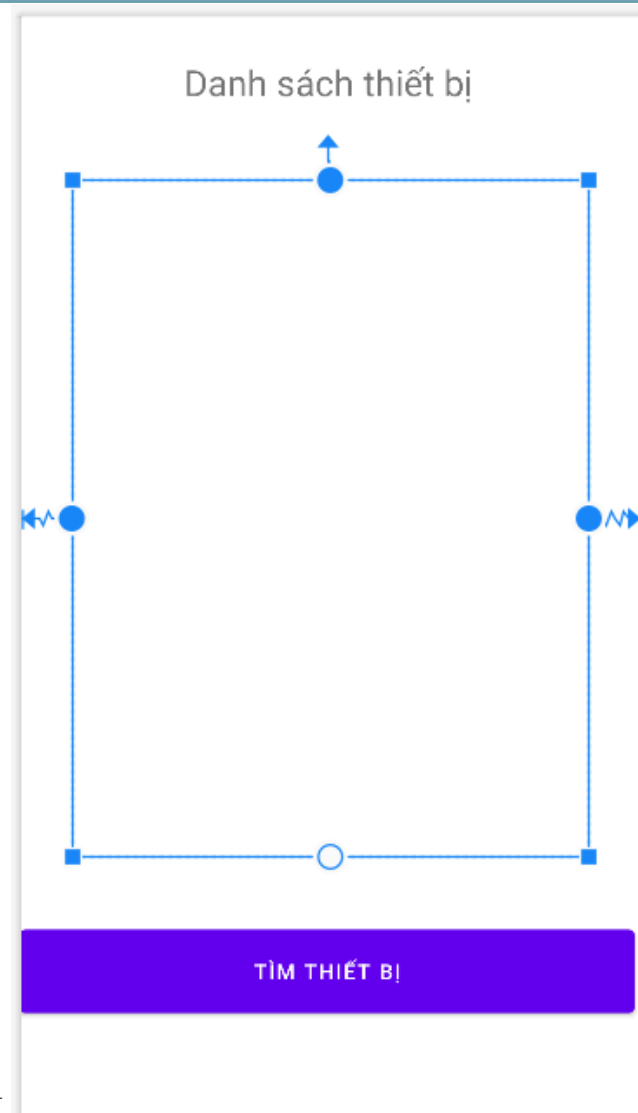


## □ Bước 1: Xây dựng Giao Diện activity\_main.xml

```
<ListView
    android:id="@+id/listTb"
    android:layout_width="343dp"
    android:layout_height="450dp"
    android:layout_margin="30dp"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/textView2" />

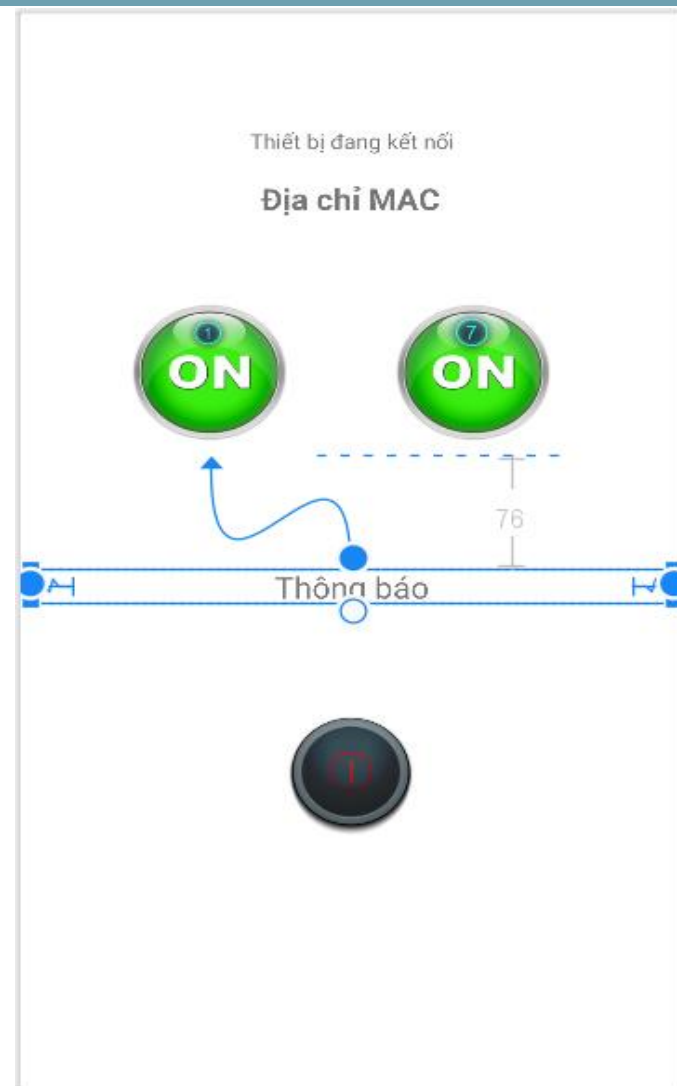
<Button
    android:id="@+id/btnTimthietbi"
    android:layout_width="409dp"
    android:layout_height="67dp"
    android:layout_marginTop="44dp"
    android:layout_marginEnd="4dp"
    android:text="Tìm Thiết Bị"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/listTb" />

</androidx.constraintlayout.widget.ConstraintLayout>
```



## □ Bước 1: Xây dựng Giao Diện activity\_control.xml

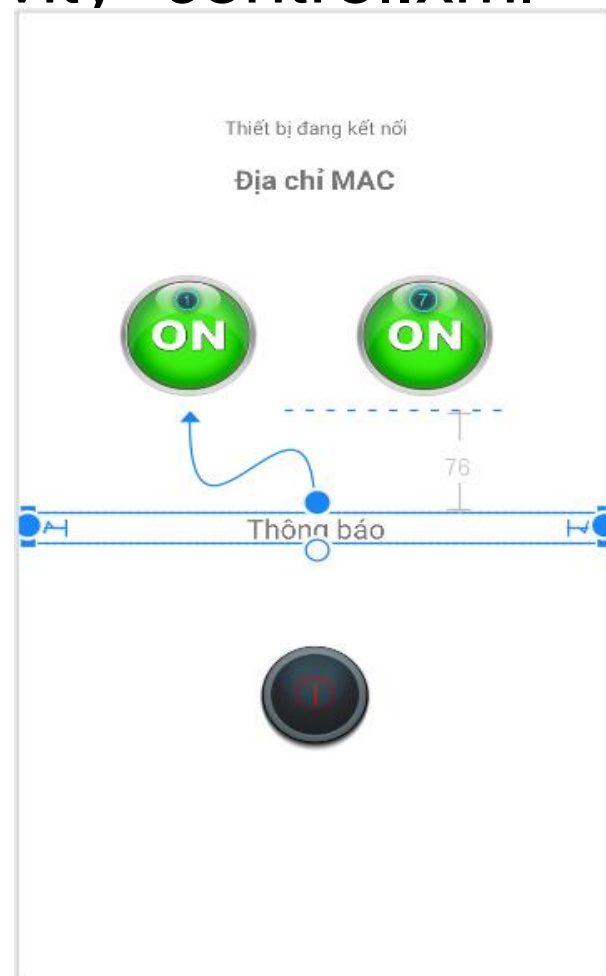
```
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".BlueControl">
    <ImageButton
        android:id="@+id/btnTb1"
        android:layout_width="116dp"
        android:layout_height="112dp"
        android:layout_marginStart="60dp"
        android:layout_marginTop="92dp"
        android:background="@drawable/tb1on"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView" />
    <ImageButton
        android:id="@+id/btnTb2"
        android:layout_width="116dp"
        android:layout_height="112dp"
        android:layout_marginTop="92dp"
        android:layout_marginEnd="60dp"
        android:background="@drawable/tb7on"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.813"
        app:layout_constraintStart_toEndOf="@+id/btnTb1"
        app:layout_constraintTop_toBottomOf="@+id/textView" />
```



## □ Bước 1: Xây dựng Giao Diện activity control.xml

```
<TextView
    android:id="@+id/textV1"
    android:layout_width="400dp"
    android:layout_height="23dp"
    android:layout_marginStart="32dp"
    android:layout_marginTop="76dp"
    android:layout_marginEnd="32dp"
    android:gravity="center_horizontal|center_vertical"
    android:text="Thông báo"
    android:textSize="20sp"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/btnTb1" />

<TextView
    android:id="@+id/textView"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="76dp"
    android:text="Thiết bị đang kết nối"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
```

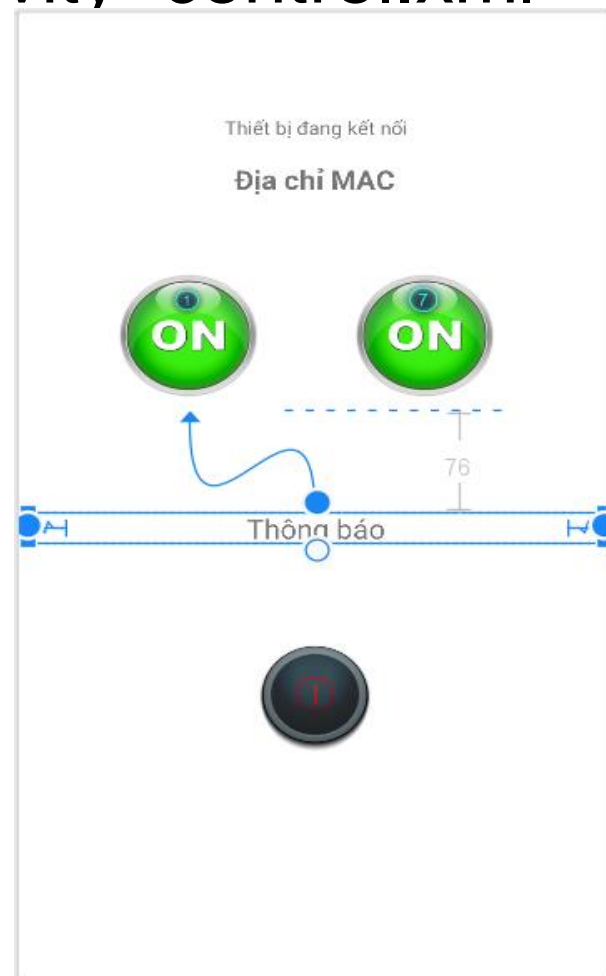


## □ Bước 1: Xây dựng Giao Diện activity control.xml

```

<TextView
    android:id="@+id/textViewMAC"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="16dp"
    android:text="Địa chỉ MAC"
    android:textSize="20sp"
    android:textStyle="bold"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.498"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/textView" />

<ImageButton
    android:id="@+id/btnDisc"
    android:layout_width="90dp"
    android:layout_height="90dp"
    android:layout_alignParentStart="true"
    android:layout_alignParentLeft="true"
    android:layout_marginTop="76dp"
    android:background="@drawable/btnnotconnect"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.498"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/textV1" />
</androidx.constraintlayout.widget.ConstraintLayout>
    
```



## □ Bước 2: Viết Code điều khiển MainActivity.java

```
public class MainActivity extends AppCompatActivity {  
    Button btnPaired;  
    ListView listDanhSach;  
    public static int REQUEST_BLUETOOTH = 1;  
    //Bluetooth  
    private BluetoothAdapter myBluetooth = null;  
    private Set<BluetoothDevice> pairedDevices;  
    public static String EXTRA_ADDRESS = "device_address";  
}
```



## □ Bước 2: Viết Code điều khiển MainActivity.java

```
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    //ánh xạ
    btnPaired = (Button) findViewById(R.id.btnTimthietbi);
    listDanhSach=(ListView) findViewById(R.id.listTb);
    //Kiểm tra thiết bị có Bluetooth
    myBluetooth = BluetoothAdapter.getDefaultAdapter();
    if(myBluetooth == null){
        //Show a message. that the device has no bluetooth adapter
        Toast.makeText(getApplicationContext(), text: "Thiết bị Bluetooth chưa bật", Toast.LENGTH_LONG).show();
        //finish apk
        finish();
    }else if(!myBluetooth.isEnabled()){
        //Ask to the user turn the bluetooth on
        Intent turnBTon = new Intent(BluetoothAdapter.ACTION_REQUEST_ENABLE);
        if (ActivityCompat.checkSelfPermission( context: this
            |, Manifest.permission.BLUETOOTH_CONNECT) != PackageManager.PERMISSION_GRANTED) {
            Toast.makeText(getApplicationContext(), text: "Thiết bị Bluetooth chưa bật", Toast.LENGTH_LONG).show();
        }
        Toast.makeText(getApplicationContext(), text: "Thiết bị Bluetooth đã bật", Toast.LENGTH_LONG).show();
        // startForResult.launch(turnBTon);
        startActivityForResult(turnBTon, REQUEST_BLUETOOTH);
    }
    //Kết thúc kiểm tra thiết bị có bluetooth
    //thực hiện tìm thiết bị
    btnPaired.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) { pairedDevicesList(); //gọi hàm tìm thiết bị }
    });
}
```

## □ Bước 2: Viết Code điều khiển MainActivity.java

```
//viết hàm
private void pairedDevicesList() {
    if (ActivityCompat.checkSelfPermission( context: this
        , Manifest.permission.BLUETOOTH_CONNECT) != PackageManager.PERMISSION_GRANTED) {
        pairedDevices = myBluetooth.getBondedDevices();
        ArrayList list = new ArrayList();

        if (pairedDevices.size() > 0) {
            for (BluetoothDevice bt : pairedDevices) {
                if (ActivityCompat.checkSelfPermission( context: this
                    , Manifest.permission.BLUETOOTH_CONNECT) != PackageManager.PERMISSION_GRANTED) {
                    Toast.makeText(getApplicationContext(), text: "Danh sách thiết bị Bluetooth đã bật", Toast.LENGTH_LONG).show();
                    list.add(bt.getName() + "\n" + bt.getAddress()); //Get the device's name and the address
                }
            }
        }
        else
        {
            Toast.makeText(getApplicationContext(), text: "Không tìm thấy thiết bị kết nối.", Toast.LENGTH_LONG).show();
        }

        final ArrayAdapter adapter = new ArrayAdapter( context: this, android.R.layout.simple_list_item_1, list);
        listDanhSach.setAdapter(adapter);
        listDanhSach.setOnItemClickListener(myItemClickListener); //Method called when the device from the list is clicked
        return;
    }
}
```

## □ Bước 3: Viết Code điều khiển BlueControl.java

```
public class BlueControl extends AppCompatActivity {
    //public static final int REQUEST_BLUETOOTH = 1;
    ImageButton btnTb1, btnTb2, btnDis;
    TextView txt1, txtMAC;
    BluetoothAdapter myBluetooth = null;
    BluetoothSocket btSocket = null;
    private boolean isBtConnected = false;
    Set<BluetoothDevice> pairedDevices1;
    String address = null;
    private ProgressDialog progress;
    int flaglamp1;
    int flaglamp2;
    //SPP UUID. Look for it
    static final UUID myUUID = UUID.fromString("00001101-0000-1000-8000-00805F9B34FB");
```

## □ Bước 3: Viết Code điều khiển BlueControl.java

```
@Override
protected void onCreate(@Nullable Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    Intent newint = getIntent();
    address = newint.getStringExtra(MainActivity.EXTRA_ADDRESS); //receive the address of the bluetooth device
    setContentView(R.layout.activity_control);
    //ánh xạ
    btnTb1 = (ImageButton) findViewById(R.id.btnTb1);
    btnTb2 = (ImageButton) findViewById(R.id.btnTb2);
    txt1 = (TextView) findViewById(R.id.textV1);
    txtMAC = (TextView) findViewById(R.id.textViewMAC);
    btnDis = (ImageButton) findViewById(R.id.btnDisc);
    new ConnectBT().execute();//Call the class to connect
    btnTb1.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) { thietTbi1(); //gọi hàm }
    });
    btnTb2.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) { thietTbi7(); //gọi hàm }
    });
    btnDis.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) { Disconnect(); }
    });
}
```

## □ Bước 3: Viết Code điều khiển BlueControl.java

```
//viết hàm
private void thietTbi1() {
    if (btSocket != null) {
        try {

            if (this.flaglamp1 == 0) {
                this.flaglamp1 = 1;
                this.btnTb1.setBackgroundResource(R.drawable.tb1on);
                btSocket.getOutputStream().write("1".toString().getBytes());
                txt1.setText("Thiết bị số 1 đang bật");
                return;
            } else {
                if (this.flaglamp1 != 1) return;
                {
                    this.flaglamp1 = 0;
                    this.btnTb1.setBackgroundResource(R.drawable.tb1off);
                    btSocket.getOutputStream().write("A".toString().getBytes());
                    txt1.setText("Thiết bị số 1 đang tắt");
                    return;
                }
            }
        }

    } catch (IOException e) {
        msg(s: "Lỗi");
    }
}
```

```
private void Disconnect() {
    if (btSocket != null) //If the btSocket is busy
    {
        try {
            btSocket.close(); //close connection
        } catch (IOException e) {
            msg(s: "Lỗi");
        }
    }
    finish(); //return to the first layout
}
```

## □ Bước 3: Viết Code điều khiển BlueControl.java

```
private void thiettb17() {
    if (btSocket != null) {
        try {
            if (this.flaglamp2 == 0) {
                this.flaglamp2 = 1;
                this.btnTb2.setBackgroundResource(R.drawable.tb2on);
                btSocket.getOutputStream().write("7".toString().getBytes());
                txt1.setText("Thiết bị số 7 đang bật");
                return;
            } else {
                if (this.flaglamp2 != 1) return;
                {
                    this.flaglamp2 = 0;
                    this.btnTb2.setBackgroundResource(R.drawable.tb2off);
                    btSocket.getOutputStream().write("6".toString().getBytes());
                    txt1.setText("Thiết bị số 7 đang tắt");
                    return;
                }
            }
        }
    }
} catch (IOException e) {
    msg(s: "Lỗi");
}
}
```

## □ Bước 3: Viết Code điều khiển BlueControl.java

```
private class ConnectBT extends AsyncTask<Void, Void, Void> // UI thread
{
    private boolean ConnectSuccess = true; //if it's here, it's almost connected
    @Override
    protected void onPreExecute() {
        //show a progress dialog
        progress = ProgressDialog.show(context: BlueControl.this, title: "Đang kết nối...", message: "Xin vui lòng đợi!!!");
    }
    @Override
    protected Void doInBackground(Void... devices) //while the progress dialog is shown, the connection is done in background
    {
        try {
            if (btSocket == null || !isBtConnected) {
                myBluetooth = BluetoothAdapter.getDefaultAdapter(); //get the mobile bluetooth device
                //connects to the device's address and checks if it's available
                BluetoothDevice dispositivo = myBluetooth.getRemoteDevice(address);
                if (ActivityCompat.checkSelfPermission(context: BlueControl.this
                    , Manifest.permission.BLUETOOTH_CONNECT) != PackageManager.PERMISSION_GRANTED) {
                    //create a RFCOMM (SPP) connection
                    btSocket = dispositivo.createInsecureRfcommSocketToServiceRecord(myUUID);
                    BluetoothAdapter.getDefaultAdapter().cancelDiscovery();
                    btSocket.connect(); //start connection
                }
            }
        }
        catch (IOException e)
        {
            ConnectSuccess = false; //if the try failed, you can check the exception here
        }
        return null;
    }
}
```

## □ Bước 3: Viết Code điều khiển BlueControl.java

```
@Override
protected void onPostExecute(Void result) //after the doInBackground, it checks if everything went fine
{
    super.onPostExecute(result);

    if (!ConnectSuccess)
    {
        msg(s: "Kết nối thất bại ! Kiểm tra thiết bị.");
        finish();
    }
    else
    {
        msg(s: "Kết nối thành công.");
        isBtConnected = true;
        pairedDevicesList1();
    }
    progress.dismiss();
}
```

```
// fast way to call Toast
```

```
private void msg(String s) {
    Toast.makeText(getApplicationContext(), s, Toast.LENGTH_LONG).show();
}
```



## □ Bước 3: Viết Code điều khiển BlueControl.java

```
private void pairedDevicesList1() {

    if (ActivityCompat.checkSelfPermission(context: this
        , Manifest.permission.BLUETOOTH_CONNECT) != PackageManager.PERMISSION_GRANTED) {
        pairedDevices1 = myBluetooth.getBondedDevices();

        if (pairedDevices1.size() > 0) {
            for (BluetoothDevice bt : pairedDevices1) {
                txtMAC.setText(bt.getName() + " - " + bt.getAddress()); //Get the device's name and the address
            }
        } else {
            Toast.makeText(getApplicationContext(), text: "Không tìm thấy thiết bị kết nối.", Toast.LENGTH_LONG).show();
        }
    }
}
```

## □ Bước 4: Nạp Code vào thiết bị

```
#include <SoftwareSerial.h>
SoftwareSerial mySerial(10, 11);
#define tb1 2
#define tb2 3
char val;
String statustb1, statustb2;
void setup() {
    pinMode(tb1, OUTPUT);
    digitalWrite(tb1, LOW);
    pinMode(tb2, OUTPUT);
    digitalWrite(tb2, LOW);
    mySerial.begin(9600);
    Serial.begin(9600);
}
void loop() {
    //cek data serial from bluetooth android App
    if( mySerial.available() >0 ) {
        val = mySerial.read();
        Serial.println(val);
    }
    if( val == '1' ) {
        digitalWrite(tb1, HIGH); statustb1="1"; }
    else if( val == '2' ) {
        digitalWrite(tb2, HIGH); statustb2="2"; }
    else if( val == 'A' ) {
        digitalWrite(tb1, LOW); statustb1="A"; }
    else if( val == 'B' ) {
        digitalWrite(tb2, LOW); statustb2="B"; }

    else if( val == 'S' ) {
        delay(500);
        mySerial.println(statustb1+statustb2+"J"); //delay(500);
        val=' ';
    }
}
```