

Tutorial PNET Android

Guillermo López García, Elías M

29 de mayo de 2020

Índice

1. Introducción	2
2. Desplegar el Backend en Heroku	2
3. Crear clase útil Database, AsyncTask y ProcessBuilder	3
4. Activity's, RecyclerView y ClickListener	15
5. Widget	45
6. AndroidManifest.xml	45
7. Resources	47
8. Gradle	73
9. Conclusión	75
Referencias	75

1. Introducción

En este tutorial vamos a explicar paso a paso como hemos desarrollado la aplicación Android para nuestro proyecto, así como mostrar el código relevante para dicha tarea.

2. Desplegar el Backend en Heroku

En primera instancia, necesitamos desplegar el Backend de nuestra aplicación en un servidor con un dominio global, para que así podamos acceder con nuestra aplicación Android a los datos de nuestro proyecto.

Por ello, debemos desplegar el Backend con los siguientes archivos en el repositorio con el contenido mostrado:

- Procfile

```
web: node backend/index.js
```

- app.json

```
{
  "name": "Programaci3n en Internet Proyecto",
  "description": "Despliegue del backend en heroku",
  "repository": "https://github.com/guilogar/pnet",
  "keywords": ["node", "express", "heroku"],
  "image": "heroku/nodejs"
}
```

- .env

```
TIMES=2
```

- package.json

```
{
  "name": "pnet",
  "version": "1.0.0",
  "description":
    "Repositorio para la asignatura Programaci3n en Internet",
  "main": "backend/index.js",
  "dependencies": {
    "cors": "^2.8.5",
    "express": "^4.17.1",
    "html5-validator": "^1.2.1",
    "mongodb": "^3.5.5",
    "morgan": "^1.10.0"
  },
  "devDependencies": {},
}
```

```

    "scripts": {
      "test": "echo_\\"Error: no test specified\\"" &&_exit_1"
    },
    "repository": {
      "type": "git",
      "url": "git+https://github.com/guilogar/pnet.git"
    },
    "author": "",
    "license": "ISC",
    "bugs": {
      "url": "https://github.com/guilogar/pnet/issues"
    },
    "homepage": "https://github.com/guilogar/pnet#readme"
  }
}

```

Por último, añadir como origen remoto al repositorio local con **"heroku login"**, **"heroku git:clone -a NombreDelProyectoEnHeroku"** hacer el típico **"git push heroku master"**.

3. Crear clase útil Database, AsyncTask y ProcessBuilder

Bien, a partir de esta sección, mostraremos ya la lógica interna de la aplicación.

Así pues, empezamos encapsulando y abstrayendo el concepto de acceder a los datos a través de los endpoints en unas clases útiles, para así poder reutilizar de manera sencilla el acceder a los datos y obtenerlos de forma sencilla y amena.

Por ende, ponemos el código resultante de dicho análisis e implementación del problema:

- Database.java

```

package es.uca.android.application.Database;

import org.json.JSONArray;
import org.json.JSONException;
import org.json.JSONObject;

import java.util.Map;
import java.util.concurrent.ExecutionException;

public class Database
{
    private ProcessBuilder pb;
    private Map<String, String> env;
}

```

```

private int status = 0;

public Database(ProcessBuilder pb)
{
    this.setProcessBuilder(pb);
}

public Database()
{
    this.setProcessBuilder(GenericProcessBuilder.genericProcess());
}

private void setProcessBuilder(ProcessBuilder pb)
{
    this.pb = pb;
    this.env = this.pb.environment();
}

private Object returnResult(String result) throws JSONException
{
    try
    {
        return new JSONArray(result);
    } catch (Exception e)
    {
        return new JSONObject(result);
    }
}

public int getStatusOfLastRequest()
{
    return this.status;
}

public Object getAllData(String collection)
throws JSONException, ExecutionException, InterruptedException
{
    HttpGetRequest asyncTask =
new HttpGetRequest(this.env.get("URLBASE"), collection);
    asyncTask.execute();
    String result = asyncTask.get();

    this.status = asyncTask.getResponseCode();

    return this.returnResult(result);
}

```

```

public Object getData(String collection , String id)
throws JSONException , ExecutionException , InterruptedException
{
    HttpGetRequest asyncTask =
new HttpGetRequest(this.env.get("URLBASE"), collection , id);
    asyncTask.execute();
    String result = asyncTask.get();

    this.status = asyncTask.getResponseCode();

    return this.returnResult(result);
}

public Object postData(String collection , Map<String , Object> data)
throws JSONException , ExecutionException , InterruptedException
{
    HttpPostRequest asyncTask = new HttpPostRequest(
        this.env.get("URLBASE"), collection , data
    );
    asyncTask.execute();
    String result = asyncTask.get();

    this.status = asyncTask.getResponseCode();

    return this.returnResult(result);
}

public Object putData(String collection ,
Map<String , Object> data , String id)
throws JSONException , ExecutionException , InterruptedException
{
    HttpPutRequest asyncTask = new HttpPutRequest(
        this.env.get("URLBASE"), collection , id , data
    );
    asyncTask.execute();
    String result = asyncTask.get();

    this.status = asyncTask.getResponseCode();

    return this.returnResult(result);
}

public Object deleteData(String collection , String id)
throws JSONException , ExecutionException , InterruptedException
{

```

```

        HttpDeleteRequest asyncTask = new HttpDeleteRequest(
            this.env.get("URLBASE"), collection, id
        );
        asyncTask.execute();
        String result = asyncTask.get();

        this.status = asyncTask.getResponseCode();

        return this.returnResult(result);
    }
}

```

■ HttpRequest.java

```

package es.uca.android.application.Database;

import android.os.AsyncTask;

public class HttpRequest extends AsyncTask<Void, Void, String>
{

    private String url;
    private String collection;
    private int responseCode = 0;

    public HttpRequest(String url, String collection)
    {
        this.url = url;
        this.collection = collection;
    }

    public int getResponseCode()
    {
        return this.responseCode;
    }

    public void setResponseCode(int code) { this.responseCode = code; }
    public String getUrl() { return this.url; }
    public String getCollection() { return this.collection; }

    protected String doInBackground(Void... params)
    {
        return null;
    }
}

```

■ HttpGetRequest.java

```

package es.uca.android_application.Database;

import java.io.BufferedInputStream;
import java.io.InputStream;
import java.net.HttpURLConnection;
import java.net.URL;
import java.util.Scanner;

public class HttpGetRequest extends HttpRequest
{
    public HttpGetRequest(String url, String collection)
    {
        super(url, collection);
    }

    public HttpGetRequest(String url, String collection, String id)
    {
        super(url, collection + "/" + id);
    }

    public String httpRequest(String url, String collection)
    {
        String text = "";
        HttpURLConnection urlConnection = null;

        try
        {
            URL urlToRequest = new URL(url + '/' + collection);
            urlConnection =
                (HttpURLConnection) urlToRequest.openConnection();
            urlConnection.setRequestMethod("GET");
            InputStream in =
                new BufferedInputStream(urlConnection.getInputStream());

            this.setResponseCode(urlConnection.getResponseCode());
            text = new Scanner(in).useDelimiter("\\A").next();
        }
        catch (Exception e)
        {
            return "";
        }
        finally
        {
            if(urlConnection != null) urlConnection.disconnect();
        }
    }
}

```

```

        return text;
    }

    protected String doInBackground(Void... params)
    {
        try {
            return this.httpRequest(this.getUrl(), this.getCollection());
        } catch (Exception e)
        {
            return e.toString();
        }
    }
}

```

■ HttpPostRequest.java

```

package es.uca.android_application.Database;

import java.io.BufferedOutputStream;
import java.io.BufferedReader;
import java.io.BufferedWriter;
import java.io.InputStreamReader;
import java.io.OutputStream;
import java.io.OutputStreamWriter;
import java.io.UnsupportedEncodingException;
import java.net.HttpURLConnection;
import java.net.URL;
import java.net.URLEncoder;
import java.util.Map;

public class HttpPostRequest extends HttpRequest
{
    private Map<String, Object> data;

    public HttpPostRequest(String url, String collection,
Map<String, Object> data)
    {
        super(url, collection);
        this.data = data;
    }

    public HttpPostRequest(String url, String collection, String id,
Map<String, Object> data)
    {
        super(url, collection + "/" + id);
        this.data = data;
    }
}

```



```

public String httpRequest(
    String urlString ,
    String collection ,
    Map<String , Object> data
)
throws UnsupportedOperationException
{
    StringBuilder result = new StringBuilder ();
    boolean first = true;

    for (Map.Entry<String , Object> entry : data.entrySet ())
    {
        if ( first )
            first = false;
        else
            result.append("&");

        result.append(URLEncoder.encode(entry.getKey(), "UTF-8"));
        result.append("=");
        result.append(
            URLEncoder.encode((String) entry.getValue(), "UTF-8")
        );
    }

    String params = result.toString();
    OutputStream out = null;

    String response = "";

    try
    {
        // make the http post
        URL url = new URL(urlString + "/" + collection);
        HttpURLConnection urlConnection =
            (HttpURLConnection) url.openConnection();
        urlConnection.setRequestMethod("POST");
        out =
            new BufferedOutputStream(urlConnection.getOutputStream());

        BufferedWriter writer =
            new BufferedWriter(new OutputStreamWriter(out, "UTF-8"));
        writer.write(params);
        writer.flush();
        writer.close();
        out.close();
    }
}

```

```

        urlConnection.connect();

        this.setResponseCode(urlConnection.getResponseCode());

        // see the response...
        String line;
        BufferedReader br =
        new BufferedReader(
            new InputStreamReader(
                urlConnection.getInputStream()
            )
        );

        while ((line = br.readLine()) != null)
        {
            response += line;
        }
    } catch (Exception e)
    {
        return "";
    }

    return response;
}

protected String doInBackground(Void... params)
{
    return this.httpRequest(
        this.getUrl(),
        this.getCollection(),
        this.data
    );
}
}

```

■ HttpPutRequest.java

```

package es.uca.android.application.Database;

import java.io.BufferedOutputStream;
import java.io.BufferedReader;
import java.io.BufferedWriter;
import java.io.InputStreamReader;
import java.io.OutputStream;
import java.io.OutputStreamWriter;
import java.io.UnsupportedEncodingException;

```

```

import java.net.HttpURLConnection;
import java.net.URL;
import java.net.URLEncoder;
import java.util.Map;

public class HttpPutRequest extends HttpRequest
{
    private Map<String, Object> data;

    public HttpPutRequest(String url, String collection,
Map<String, Object> data)
    {
        super(url, collection);
        this.data = data;
    }

    public HttpPutRequest(String url, String collection, String id,
Map<String, Object> data)
    {
        super(url, collection + "/" + id);
        this.data = data;
    }

    public String httpRequest(
        String urlString,
        String collection,
        Map<String, Object> data
    )
    throws UnsupportedOperationException
    {
        StringBuilder result = new StringBuilder();
        boolean first = true;

        for(Map.Entry<String, Object> entry : data.entrySet())
        {
            if (first)
                first = false;
            else
                result.append("&");

            result.append(URLEncoder.encode(entry.getKey(), "UTF-8"));
            result.append("=");
            result.append(
                URLEncoder.encode((String) entry.getValue(), "UTF-8")
            );
        }
    }
}

```

```

String params = result.toString();
OutputStream out = null;

String response = "";

try
{
    // make the http post
    URL url = new URL(urlString + "/" + collection);
    HttpURLConnection urlConnection =
        (HttpURLConnection) url.openConnection();
    urlConnection.setRequestMethod("PUT");
    out =
        new BufferedOutputStream(urlConnection.getOutputStream());

    BufferedWriter writer =
        new BufferedWriter(new OutputStreamWriter(out, "UTF-8"));
    writer.write(params);
    writer.flush();
    writer.close();
    out.close();

    urlConnection.connect();

    this.setResponseCode(urlConnection.getResponseCode());

    // see the response...
    String line;
    BufferedReader br =
        new BufferedReader(
            new InputStreamReader(
                urlConnection.getInputStream()
            )
        );

    while ((line = br.readLine()) != null)
    {
        response += line;
    }
} catch (Exception e)
{
    return "";
}

return response;

```

```

    }

    protected String doInBackground(Void... params)
    {
        return this.httpRequest(
            this.getUrl(),
            this.getCollection(),
            this.data
        );
    }
}

```

■ HttpDeleteRequest.java

```

package es.uca.android_application.Database;

import java.io.BufferedInputStream;
import java.io.InputStream;
import java.net.HttpURLConnection;
import java.net.URL;
import java.util.Scanner;

public class HttpDeleteRequest extends HttpRequest
{
    public HttpDeleteRequest(String url, String collection, String id)
    {
        super(url, collection + "/" + id);
    }

    public String httpRequest(String urlString, String collection)
    {
        String text = "";
        HttpURLConnection urlConnection = null;
        try
        {
            URL urlToRequest =
            new URL(urlString + '/' + collection);
            urlConnection =
            (HttpURLConnection) urlToRequest.openConnection();
            urlConnection.setRequestMethod("DELETE");
            InputStream in =
            new BufferedInputStream(
                urlConnection.getInputStream()
            );

            this.setResponseCode(urlConnection.getResponseCode());
            text = new Scanner(in).useDelimiter("\\A").next();
        }
        catch (Exception e)
        {
            return null;
        }
    }
}

```

```

        } catch (Exception e)
        {
            return "";
        }

        return text;
    }

    protected String doInBackground(Void... params)
    {
        return this.httpRequest(this.getUrl(), this.getCollection());
    }
}

```

Por último, para utilizar contenedores virtuales y que la información que se utiliza en muchos lugares este condensada en el uso de unas variables de entorno, se usa los llamados ProcessBuilder de Java, donde se introduce la variable de entorno **URL_BASE** con el valor "**https://pnet.herokuapp.com/api/v1**" para hacer las llamadas siempre al dominio global donde se encuentra nuestro Backend hecho en NodeJS.

Así pues, mostramos la codificación de una clase que se encarga de devolver un ProcessBuilder con la variable de entorno **URL_BASE** para ser utilizada en el resto de la aplicación Android.

```

package es.uca.android_application.Database;

import java.util.Map;

public class GenericProcessBuilder
{
    public static ProcessBuilder genericProcess()
    {
        return GenericProcessBuilder.specificProcess(
            "https://pnet.herokuapp.com/api/v1"
        );
    }

    public static ProcessBuilder specificProcess(String url)
    {
        ProcessBuilder pb = new ProcessBuilder();

        Map<String, String> env = pb.environment();
        env.put("URLBASE", url);

        return pb;
    }
}

```

```
}
```

Por otra parte, hay que decir que en el resto del proyecto se ha seguido con la encapsulacion y la abstracción de la misma forma.

4. Activity's, RecyclerView y ClickListener

Bien, en este paso, vamos a exponer las clases encargadas de recibir las Activity, los RecyclerView y los eventos ClickListener, para dejar toda la evidencia posible de la robustez y modularidad de la aplicacion.

Así pues:

- MainActivity.java

```
package es.uca.android_application;

import android.content.Intent;
import android.os.Bundle;
import android.view.Menu;
import android.view.MenuInflater;
import android.view.MenuItem;
import android.widget.Toast;
import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;

import es.uca.android_application.Database.Database;
import es.uca.android_application.EventAttendees.event_attendees;
import es.uca.android_application.ImportantDates.ImportantDates;
import es.uca.android_application.Localization.Localization;
import es.uca.android_application.Program.program;

public class MainActivity extends AppCompatActivity
{
    private static Boolean firstTimeBootig=true;
    @Override
    //Cuando eliges una opción en el menú ..
    public boolean onOptionsItemSelected(@NonNull MenuItem item)
    {
        //En función del elemento que selecciones en el menú ..
        switch(item.getItemId())
        {
            case R.id.item1:
            {
                Intent intent = new Intent(this, event_attendees.class);
                startActivity(intent);
                return true;
            }
        }
    }
}
```

```

        case R.id.item2:
        {
            Intent intent2 = new Intent(this, program.class);
            startActivity(intent2);
            return true;
        }
        case R.id.item3:
        {
            Intent intent = new Intent(this, ImportantDates.class);
            startActivity(intent);
            return true;
        }
        case R.id.item4:
        {
            Intent intent = new Intent(this, Localization.class);
            startActivity(intent);
            return true;
        }
        default:
        {
            return super.onOptionsItemSelected(item);
        }
    }
}
@Override
public boolean onCreateOptionsMenu(Menu menu)
{
    MenuInflater inflater = getMenuInflater();
    inflater.inflate(R.menu.main_menu, menu);
    return true;
}
@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    if (firstTimeBootng)
    {
        // To renewal data when application init....
        Database db = new Database();
        try {
            String result = db.getAllData("renewalData").toString();
            Toast.makeText(this, result, Toast.LENGTH_SHORT).show();
            firstTimeBootng = false;
        } catch (Exception e)
        {
            Toast.makeText(

```



```

        this, e.toString(), Toast.LENGTH_SHORT
    ).show();
    }
}
}
}

```

■ program.java

```

package es.uca.android_application.Program;

import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import androidx.recyclerview.widget.LinearLayoutManager;
import androidx.recyclerview.widget.RecyclerView;

import android.content.Intent;
import android.os.AsyncTask;
import android.os.Bundle;
import android.util.Pair;
import android.view.MenuItem;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;

import org.json.JSONArray;
import org.json.JSONObject;

import java.io.BufferedInputStream;
import java.io.InputStream;
import java.net.HttpURLConnection;
import java.net.URL;
import java.util.ArrayList;
import java.util.Scanner;

import es.uca.android_application.Database.Database;
import es.uca.android_application.MainActivity;
import es.uca.android_application.R;

public class program extends AppCompatActivity
{
    private RecyclerView mRecyclerView;
    private RecyclerView.Adapter mAdapter;
    private RecyclerView.LayoutManager mLayoutManager;
    private Database myInvokeTask=new Database();
    private ArrayList<programItem> programs =

```

```

= new ArrayList<programItem>();
@Override
protected void onCreate(Bundle savedInstanceState)
{
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_program);
    //Referencias.
    mRecyclerView=(RecyclerView)findViewById
    (R.id.recycler_view_program);
    mRecyclerView.setHasFixedSize(true);
    layoutManager=new LinearLayoutManager(this);
    mRecyclerView.setLayoutManager(layoutManager);
    this.supportActionBar().setDisplayHomeAsUpEnabled(true);
    try
    {
        //Array de programas.
        JSONArray myArray = (JSONArray)myInvokeTask.
        .getAllData("timetable");
        //Recorrer JSON e INSERTAr en array. JSON ARRAY.
        for(int i=0; i<myArray.length(); ++i)
        {
            //Un programa.
            JSONObject obj = myArray.getJSONObject(i);

            //Descripci n del programa que estamos tratando: title.
            //Hora de una actividad perteneciente a un programa: hour.
            //Actividad perteneciente a una hora de un
            //programa: activity.

            //Un programa tiene varias actividades,
            //cada una con una hora.
            JSONArray activities= new JSONArray(obj.getString("table"));
            String hour1 = activities.getJSONObject(0).
            .getString("hour");
            String hour2 = activities.getJSONObject(1).
            .getString("hour");
            String hour3 = activities.getJSONObject(2).
            .getString("hour");
            String hour4 = activities.getJSONObject(3).
            .getString("hour");
            String hour5 = activities.getJSONObject(4).
            .getString("hour");
            String hour6 = activities.getJSONObject(5).
            .getString("hour");
            String activity1 = activities.getJSONObject(0).
            .getString("activity");

```

```

        String activity2 = activities.getJSONObject(1).
            .getString("activity");
        String activity3 = activities.getJSONObject(2).
            .getString("activity");
        String activity4 = activities.getJSONObject(3).
            .getString("activity");
        String activity5 = activities.getJSONObject(4).
            .getString("activity");
        String activity6 = activities.getJSONObject(5).
            .getString("activity");
        programs.add(new programItem(
            obj.getString("title"),
            new Pair<String, String>(hour1, activity1),
            new Pair<String, String>(hour2, activity2),
            new Pair<String, String>(hour3, activity3),
            new Pair<String, String>(hour4, activity4),
            new Pair<String, String>(hour5, activity5),
            new Pair<String, String>(hour6, activity6)
        ));
    }

    mAdapter=new programAdapter(programs);
    mRecyclerView.setAdapter(mAdapter);
} catch (Exception e) {
    e.printStackTrace();}
}
@Override
//Controlamos lo que hace el bot n de volver.
public boolean onOptionsItemSelected(@NonNull MenuItem item)
{
    switch(item.getItemId())
    {
        case android.R.id.home:
        {
            try
            {
                //Terminamos la activity.
                this.finish();
            } catch (Exception e)
            {
                Toast.makeText(this, e.toString(),
                    ,Toast.LENGTH_SHORT).show();
            }
            return true;
        }
        default:

```

```

        {
            return super.onOptionsItemSelected(item);
        }
    }
}

```

■ attendee_view.java

```

package es.uca.android_application.EventAttendees;

import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.os.AsyncTask;
import android.os.Bundle;
import android.view.MenuItem;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;

import org.json.JSONArray;
import org.json.JSONObject;

import java.io.BufferedInputStream;
import java.io.InputStream;
import java.net.HttpURLConnection;
import java.net.URL;
import java.nio.charset.StandardCharsets;
import java.util.Scanner;

import es.uca.android_application.Database.Database;
import es.uca.android_application.R;

public class attendee_view extends AppCompatActivity
{
    private Button change, delete;
    private TextView name, surnames, email, ad, dd, dni, phone, bd, idate;
    private int requestCode;
    private JSONObject results;
    //private deleteAttende request;
    //private GetAttendee request2;
    private Database myInvokeTask = new Database();
    @Override
    protected void onCreate(Bundle savedInstanceState)

```

```

{
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_attendee_view);
    //Cogemos las referencias del layout.
    delete= (Button)findViewById(R.id.delete_form2);
    change=(Button)findViewById(R.id.put_form2);
    name=(TextView)findViewById(R.id.name_text2_1);
    surnames=(TextView)findViewById(R.id.surnames_text2_1);
    email=(TextView)findViewById(R.id.email_text2_1);
    ad=(TextView)findViewById(R.id.ad_text2_1);
    dd=(TextView)findViewById(R.id.dd_text2_1);
    dni=(TextView)findViewById(R.id.dni_text2_1);
    phone=(TextView)findViewById(R.id.phone_text2_1);
    bd=(TextView)findViewById(R.id.bd_text2_1);
    idate=(TextView)findViewById(R.id.id_text2_1);

    //Hacemos visible un bot n que Android siempre crea
    //por defecto en todas las actividades (layouts):
    //el bot n de volver.
    this.supportActionBar().setDisplayHomeAsUpEnabled(true);
    //Recibimos el mensajero.
    Intent intent = getIntent();
    //Abrimos el paquete.
    final Bundle extras = intent.getExtras();
    //Colocamos la informaci n recibida en el view.
    final String id_attendee=extras.getString("id_attendee");
    try
    {
        JSONArray myArray= (JSONArray) myInvokeTask.getData(
            "inscriptions",id_attendee);
        JSONObject obj = myArray.getJSONObject(0);
        //Nombre: fname.
        //Apellidos: lname.
        //Email: ename.
        //Fecha de llegada: adname.
        //Fecha de salida: ddname.
        //DNI: dniname.
        //Tel fono: phonename.
        //Fecha de nacimiento: bdname.
        //Fecha de inscripci n: idname.
        name.setText(obj.getString("fname"));
        surnames.setText(obj.getString("lname"));
        email.setText(obj.getString("ename"));
        ad.setText(obj.getString("adname"));
        dd.setText(obj.getString("ddname"));
        dni.setText(obj.getString("dniname"));
    }
}

```

```

        phone.setText(obj.getString("phonename"));
        bd.setText(obj.getString("bdname"));
        idate.setText(obj.getString("idname"));
    }
    catch (Exception e)
    {
        e.printStackTrace();
    }

    //Listeners. (Al hacer click en un bot n..).
    delete.setOnClickListener(new View.OnClickListener()
    {
        @Override
        public void onClick(View v)
        {
            Intent transition = new Intent(attendee_view.this,
event_attendees.class);
            try
            {
                results =(JSONObject)myInvokeTask.
                .deleteData("inscriptions",id_attendee);
                String servermessage= results.getString("msg");
                responseRequestCode= myInvokeTask.
                .getStatusOfLastRequest();
                if (responseRequestCode == 200)
                {
                    Toast.makeText(getApplicationContext(),
                    ,''Asistente eliminado. C digo servidor: ''
                    +responseRequestCode+'' con descripci n: ''
                    +servermessage, Toast.LENGTHSHORT).show();
                    startActivity(transition);
                }
            }
            catch(Exception e)
            {
                responseRequestCode= myInvokeTask.
                getStatusOfLastRequest();
                Toast.makeText(getApplicationContext(),
                " Ups ,_ha_habido_un_error!_C digo_de_error_"
                +responseRequestCode+":_asistente_inexistente.",
                Toast.LENGTHSHORT).show();
                startActivity(transition);
                e.printStackTrace();
            }
        }
    });

```

```

change.setOnClickListener(new View.OnClickListener()
{
    @Override
    public void onClick(View v)
    {
        Intent intent = new Intent(getApplicationContext(),
        ,change_attendee.class);
        //La colocamos en el paquete.
        Bundle bundle = new Bundle();
        //Rellenamos el paquete, el tipo de dato
        //puesto o clave si es un String, y el dato en cuesti n.
        //A adimos la informaci n que queremos pasar.
        bundle.putString("id_attendee",id_attendee);
        //A adimos el paquete al mensajero.
        intent.putExtras(bundle);
        startActivity(intent);
    }
});
}
@Override
//Controlamos lo que hace el bot n de volver.
public boolean onOptionsItemSelected(@NonNull MenuItem item)
{
    switch(item.getItemId())
    {
        case android.R.id.home:
        {
            try
            {
                //Terminamos la activity.
                this.finish();
            } catch (Exception e)
            {
                Toast.makeText(this, e.toString(),
                ,Toast.LENGTH_SHORT).show();
            }
            return true;
        }
        default:
        {
            return super.onOptionsItemSelected(item);
        }
    }
}
}
}

```

■ change_attendee.java

```
package es.uca.android.application.EventAttendees;

import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.os.AsyncTask;
import android.os.Bundle;
import android.view.MenuItem;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

import org.json.JSONArray;
import org.json.JSONObject;

import java.io.BufferedReader;
import java.io.InputStream;
import java.io.InputStreamReader;
import java.io.OutputStreamWriter;
import java.net.HttpURLConnection;
import java.net.URL;
import java.nio.charset.StandardCharsets;
import java.util.HashMap;
import java.util.Map;
import java.util.Scanner;

import es.uca.android.application.Database.Database;
import es.uca.android.application.R;

public class change_attendee extends AppCompatActivity
{
    private Button update;
    private Database myInvokeTask = new Database();
    private JSONObject results;
    private EditText name, surnames, email, ad, dd, dni, phone, bd;
    private int responseConnCode;
    @Override
    protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_change_attendee);
        //Obtenemos referencias.
        update=(Button)findViewById(R.id.send_button3);
    }
}
```



```

name=(EditText) findViewById(R.id.name_form3);
surnames=(EditText) findViewById(R.id.surnames_form3);
email=(EditText) findViewById(R.id.email_form3);
ad=(EditText) findViewById(R.id.ad_form3);
dd=(EditText) findViewById(R.id.dd_form3);
dni=(EditText) findViewById(R.id.dni_form3);
phone=(EditText) findViewById(R.id.phone_form3);
bd=(EditText) findViewById(R.id.date_form3);
this.getSupportActionBar().setDisplayHomeAsUpEnabled(true);
//Recibimos el mensajero.
Intent intent2 = getIntent();
//Abrimos el paquete.
final Bundle extras = intent2.getExtras();
//Colocamos la informaci n recibida en el view.
final String id_attendee=extras.getString("id_attendee");
//Establecemos la informaci n por defecto
//para que el usuario tenga que escribir lo menos posible
//en el formulario de actualizaci n.
try
{
    JSONArray myArray= (JSONArray) myInvokeTask.getData
("inscriptions",id_attendee);
    JSONObject obj = myArray.getJSONObject(0);
    System.out.println(myArray);
    //Nombre: fname.
    //Apellidos: lname.
    //Email: ename.
    //Fecha de llegada: adname.
    //Fecha de salida: ddname.
    //DNI: dniname.
    //Tel fono: phonename.
    //Fecha de nacimiento: bdname.
    name.setText(obj.getString("fname"));
    surnames.setText(obj.getString("lname"));
    email.setText(obj.getString("ename"));
    ad.setText(obj.getString("adname"));
    dd.setText(obj.getString("ddname"));
    dni.setText(obj.getString("dniname"));
    phone.setText(obj.getString("phonename"));
    bd.setText(obj.getString("bdname"));
}
catch (Exception e)
{
    e.printStackTrace();
}
update.setOnClickListener(new View.OnClickListener()

```

```

{
    @Override
    public void onClick(View v) {
        if(notEmptyFields())
        {
            Map<String, Object> json_map =
            new HashMap<String, Object>();
            json_map.put("fname",
            name.getText().toString());
            json_map.put("lname",
            surnames.getText().toString());
            json_map.put("ename",
            email.getText().toString());
            json_map.put("adname",
            ad.getText().toString());
            json_map.put("ddname",
            dd.getText().toString());
            json_map.put("dniname",
            dni.getText().toString());
            json_map.put("phonename",
            phone.getText().toString());
            json_map.put("bdname",
            bd.getText().toString());

            Intent transition = new Intent
            (change_attendee.this,
            event_attendees.class);
            try
            {
                results =(JSONObject) myInvokeTask.
                putData("inscriptions", json_map,
                id_attendee);
                String servermessage= results.
                getString("msg");
                responseConnCode=myInvokeTask.
                getStatusOfLastRequest();
                if (responseConnCode == 200)
                {
                    Toast.makeText(getApplicationContext(),
                    startActivity(transition);
                }
            }
            catch(Exception e)
            {
                responseConnCode=myInvokeTask.
                getStatusOfLastRequest();
            }
        }
    }
}

```

```

        Toast.makeText(getApplicationContext(),
            '' Error al actualizar! C digo de error:
            '' +responseConnCode, Toast.LENGTHSHORT)
            .show();
        startActivity(transition);
    }
}
else
{
    Toast.makeText(getApplicationContext(), '' No
    pueden haber campos vac os!'',
    Toast.LENGTHSHORT).show();
}
}
});
}
}
//Funci n: comprobaci n de que los campos introducidos
//en el formulario de actualizaci n sean no vac os.
private Boolean notEmptyFields()
{
    if(name.getText().toString().matches(""))
    || surnames.getText().toString().matches("") ||
    email.getText().toString().matches("") ||
    ad.getText().toString().matches("") ||
    dd.getText().toString().matches("") ||
    dni.getText().toString().matches("") ||
    phone.getText().toString().matches("") ||
    bd.getText().toString().matches(""))
    {
        return false;
    }
    else
    {
        return true;
    }
}

@Override
public boolean onOptionsItemSelected(@NonNull MenuItem item)
{
    switch(item.getItemId())
    {
        case android.R.id.home:
        {
            try
            {

```

```

        this.finish();
    } catch (Exception e)
    {
        Toast.makeText(this, e.toString(),
            Toast.LENGTH_SHORT).show();
    }
    return true;
}
default:
{
    return super.onOptionsItemSelected(item);
}
}
}
}
}

```

■ form_view.java

```

package es.uca.android_application.EventAttendees;

import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.AsyncTask;
import android.os.Bundle;
import android.provider.ContactsContract;
import android.view.MenuItem;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;
import org.json.JSONObject;

import java.io.InputStream;
import java.io.OutputStreamWriter;
import java.net.HttpURLConnection;
import java.net.URL;
import java.nio.charset.StandardCharsets;
import java.util.Calendar;
import java.util.Date;
import java.util.HashMap;
import java.util.Map;
import java.util.Scanner;
import java.util.TimeZone;

import es.uca.android_application.Database.Database;

```

```

import es.uca.android_application.R;

public class form_view extends AppCompatActivity
{
    private EditText name, surnames, email, ad, dd, dni, phone_number, birthday;
    private Button send;
    private int responseConnCode;
    private JSONObject results;
    private Database myInvokeTask= new Database();

    @Override
    protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_form_view);
        //Almaceno referencias de donde voy a sacar la informaci n.
        send= (Button)findViewById(R.id.send_button);
        name = (EditText) findViewById(R.id.name_form);
        surnames = (EditText) findViewById(R.id.surnames_form);
        email = (EditText) findViewById(R.id.email_form);
        ad = (EditText) findViewById(R.id.ad_form);
        dd = (EditText) findViewById(R.id.dd_form);
        dni = (EditText) findViewById(R.id.dni_form);
        phone_number = (EditText) findViewById(R.id.phone_form);
        birthday = (EditText) findViewById(R.id.date_form);
        this.supportActionBar().setDisplayHomeAsUpEnabled(true);
        send.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v){
                //Validaci n de los campos.
                if(notEmptyFormFields())
                {
                    //Fecha actual.
                    Date now= new Date();
                    Calendar cal = Calendar.getInstance
                    (TimeZone.getTimeZone("Europe/Paris"));
                    cal.setTime(now);
                    int year = cal.get(Calendar.YEAR);
                    int month = cal.get(Calendar.MONTH);
                    int day = cal.get(Calendar.DAY_OF_MONTH);
                    month+=1;
                    String inscDate= String.valueOf(day)
                    +"/"+String.valueOf(month)
                    +"/"+String.valueOf(year);

                    Map<String, Object> json_map=

```

```

new HashMap<String , Object>();

//Le paso los par metros necesarios.
    json_map.put("fname",name.getText()
        .toString());
    json_map.put("lname",surnames.getText()
        .toString());
    json_map.put("ename",email.getText()
        .toString());
    json_map.put("adname",ad.getText()
        .toString());
    json_map.put("ddname",dd.getText()
        .toString());
    json_map.put("dniname",dni.getText()
        .toString());
    json_map.put("phonename",phone_number.getText()
        .toString());
    json_map.put("bdname",birthday.getText()
        .toString());
    json_map.put("idname",inscDate);
    Intent transition = new Intent
    (form_view.this , event_attendees.class);
    try
    {

        results= (JSONObject) myInvokeTask
        .postData("inscriptions",json_map);
        responseConnCode=myInvokeTask
        .getStatusOfLastRequest();
        String servermessage = results
        .getString("msg") ;
        if(responseConnCode == 201)
        {
            Toast.makeText(getApplicationContext() ,
            '' Registro correctamente!
            C digo servidor: ''
            +responseConnCode+' y descripci n: ''+
            servermessage , Toast.LENGTHSHORT)
            .show();
            startActivity(transition);
        }
    }
    catch (Exception e)
    {
        responseConnCode=myInvokeTask
        .getStatusOfLastRequest();
    }

```

```

        Toast.makeText(getApplicationContext(),
            '' Ha habido alg n error,
            int ntalo de nuevo! C digo de error: ''
            +responseConnCode, Toast.LENGTHSHORT)
            .show();
    }
}
else
{
    Toast.makeText(getApplicationContext(),
        '' No se permiten
        campos vac os en el formulario!'',
        Toast.LENGTHSHORT).show();
}
}
});
}
//Funci n auxiliar: comprueba que los
//campos del formulario (nuevo asistente), no son vac os.
boolean notEmptyFormFields()
{
    if(name.getText().toString().matches("") ||
        surnames.getText().toString().matches("") ||
        email.getText().toString().matches("") ||
        ad.getText().toString().matches("") ||
        dd.getText().toString().matches("") ||
        dni.getText().toString().matches("") ||
        phone_number.getText().toString().matches("") ||
        birthday.getText().toString().matches(""))
    {
        return false;
    }
    else
    {
        return true;
    }
}

@Override
//Controlamos lo que hace el bot n de volver.
public boolean onOptionsItemSelected(@NonNull MenuItem item)
{
    switch(item.getItemId())
    {
        case android.R.id.home:
    }
}

```

```

        {
            try
            {
                //Terminamos la actividad.
                this.finish();
            } catch (Exception e)
            {
                Toast.makeText(this, e.toString(), Toast.LENGTH_SHORT)
                    .show();
            }
            return true;
        }
        default:
        {
            //Se lo pasa a la clase padre el objeto
            //por si sta sabe qu hacer con l .
            return super.onOptionsItemSelected(item);
        }
    }
}

```

■ ImportantDates.java

```

package es.uca.android.application.ImportantDates;

import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import androidx.recyclerview.widget.LinearLayoutManager;
import androidx.recyclerview.widget.RecyclerView;

import android.os.Bundle;
import android.view.MenuItem;
import android.widget.Toast;

import java.util.ArrayList;

import es.uca.android.application.R;
import es.uca.android.application.ImportantDates.RecyclerView.ImportantDatesAdapter;

public class ImportantDates extends AppCompatActivity
{
    private RecyclerView mRecyclerView;
    private RecyclerView.Adapter mAdapter;
    private RecyclerView.LayoutManager layoutManager;

```



```

@Override
protected void onCreate(Bundle savedInstanceState)
{
    super.onCreate(savedInstanceState);
    this setContentView(R.layout.important_dates);

    // to make visible the back button
    this.getSupportActionBar().setDisplayHomeAsUpEnabled(true);

    this.mRecyclerView = (RecyclerView) findViewById
    (R.id.important_dates_recycler_view);
    this.mRecyclerView.setHasFixedSize(true);
    this.mLayoutManager = new LinearLayoutManager(this);
    this.mRecyclerView.setLayoutManager(this.mLayoutManager);

    try
    {
        ArrayList<T timetable> timetables = Timetable.getAllTimetable();

        mAdapter = new ImportantDatesAdapter(timetables);

        mRecyclerView.setAdapter(mAdapter);
    } catch (Exception e)
    {
        Toast.makeText(this, e.toString(),
            Toast.LENGTH_SHORT).show();
    }
}

@Override
public boolean onOptionsItemSelected(@NonNull MenuItem item)
{
    switch(item.getItemId())
    {
        case android.R.id.home:
        {
            try
            {
                this.finish();
            } catch (Exception e)
            {
                Toast.makeText(this, e.toString(),
                    Toast.LENGTH_SHORT).show();
            }
            return true;
        }
    }
}

```

```

        default:
        {
            return super.onOptionsItemSelected(item);
        }
    }
}

```

■ Localization.java

```

package es.uca.android_application.Localization;

import android.os.Bundle;
import android.util.TypedValue;
import android.view.Gravity;
import android.view.MenuItem;
import android.widget.TextView;
import android.widget.Toast;

import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;

import com.google.android.gms.maps.CameraUpdateFactory;
import com.google.android.gms.maps.GoogleMap;
import com.google.android.gms.maps.OnMapReadyCallback;
import com.google.android.gms.maps.SupportMapFragment;
import com.google.android.gms.maps.model.LatLng;
import com.google.android.gms.maps.model.MarkerOptions;

import org.json.JSONObject;

import es.uca.android_application.ImportantDates.Timetable;
import es.uca.android_application.R;

public class Localization extends AppCompatActivity
implements OnMapReadyCallback
{
    private String idEvent;
    private Timetable t;
    @Override
    protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        this setContentView(R.layout.localization);

        TextView tv = (TextView) this.findViewById(R.id.description);
        tv.setText("Mapa del mundo");
    }
}

```

```

tv.setGravity(Gravity.CENTER);
tv.setTextSize(TypedValue.COMPLEX_UNIT_SP,18);

try
{
    this.idEvent = getIntent().getExtras().getString("ID_EVENT");

    this.t = Timetable.getTimetable(this.idEvent);

    this.setTitle((String) t.getAttribute("title"));

    String description = (String) this.t.
        getAttribute("description");

    tv.setText(description);

    SupportMapFragment mapFragment = (SupportMapFragment)
        getSupportFragmentManager().findFragmentById(R.id.map);
    mapFragment.getMapAsync(this);
} catch (Exception e)
{
    this.getSupportActionBar().setDisplayHomeAsUpEnabled(true);
}
}

@Override
public void onMapReady(GoogleMap googleMap)
{
    try
    {
        JSONObject localization = (JSONObject) this.t.
            getAttribute("localization");
        String street = localization.getString("verbose");
        double x = localization.getDouble("x");
        double y = localization.getDouble("y");

        LatLng sydney = new LatLng(x, y);

        googleMap.addMarker(new MarkerOptions().
            position(sydney).title(street));
        googleMap.moveCamera(CameraUpdateFactory.newLatLng(sydney));
        googleMap.animateCamera(CameraUpdateFactory.zoomTo( 12.0f ));
    } catch (Exception e)
    {
        Toast.makeText(this, e.toString(), Toast.LENGTH_SHORT).show();
    }
}

```

```

    }

    @Override
    public boolean onOptionsItemSelected(@NonNull MenuItem item)
    {
        switch(item.getItemId())
        {
            case android.R.id.home:
            {
                try
                {
                    this.finish();
                } catch (Exception e)
                {
                    Toast.makeText(this, e.toString(),
                        Toast.LENGTH_SHORT).show();
                }
                return true;
            }
            default:
            {
                return super.onOptionsItemSelected(item);
            }
        }
    }
}

```

■ ImportantDatesAdapter

```

package es.uca.android.application.Localization;

import android.os.Bundle;
import android.util.TypedValue;
import android.view.Gravity;
import android.view.MenuItem;
import android.widget.TextView;
import android.widget.Toast;

import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;

import com.google.android.gms.maps.CameraUpdateFactory;
import com.google.android.gms.maps.GoogleMap;
import com.google.android.gms.maps.OnMapReadyCallback;
import com.google.android.gms.maps.SupportMapFragment;
import com.google.android.gms.maps.model.LatLng;

```

```

import com.google.android.gms.maps.model.MarkerOptions;

import org.json.JSONObject;

import es.uca.android_application.ImportantDates.Timetable;
import es.uca.android_application.R;

public class Localization extends AppCompatActivity
implements OnMapReadyCallback
{
    private String idEvent;
    private Timetable t;
    @Override
    protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        this setContentView(R.layout.localization);

        TextView tv = (TextView) this.findViewById(R.id.description);
        tv.setText("Mapa_del_mundo");
        tv.setGravity(Gravity.CENTER);
        tv.setTextSize(TypedValue.COMPLEX_UNIT_SP,18);

        try
        {
            this.idEvent = getIntent().getExtras().getString("ID_EVENT");

            this.t = Timetable.getTimetable(this.idEvent);

            this.setTitle((String) t.getAttribute("title"));

            String description = (String) this.t.getAttribute("description");

            tv.setText(description);

            SupportMapFragment mapFragment = (SupportMapFragment)
                getSupportFragmentManager().findFragmentById(R.id.map);
            mapFragment.getMapAsync(this);
        } catch (Exception e)
        {
            this.getSupportActionBar().setDisplayHomeAsUpEnabled(true);
        }
    }

    @Override
    public void onMapReady(GoogleMap googleMap)

```

```

{
    try
    {
        JSONObject localization = (JSONObject) this.t.
        getAttribute("localization");
        String street = localization.getString("verbose");
        double x = localization.getDouble("x");
        double y = localization.getDouble("y");

        LatLng sydney = new LatLng(x, y);

        googleMap.addMarker(new MarkerOptions().
        position(sydney).title(street));
        googleMap.moveCamera(CameraUpdateFactory.newLatLng(sydney));
        googleMap.animateCamera(CameraUpdateFactory.zoomTo( 12.0f ));
    } catch (Exception e)
    {
        Toast.makeText(this, e.toString(), Toast.LENGTHSHORT).show();
    }
}

@Override
public boolean onOptionsItemSelected(@NonNull MenuItem item)
{
    switch(item.getItemId())
    {
        case android.R.id.home:
        {
            try
            {
                this.finish();
            } catch (Exception e)
            {
                Toast.makeText(this, e.toString(),
                Toast.LENGTHSHORT).show();
            }
            return true;
        }
        default:
        {
            return super.onOptionsItemSelected(item);
        }
    }
}
}

```

■ formAdapter.java

```
package es.uca.android_application.EventAttendees;

import android.content.Context;
import android.content.Intent;
import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;
import androidx.recyclerview.widget.RecyclerView;
import java.util.ArrayList;

import es.uca.android_application.R;

public class formAdapter extends RecyclerView.
Adapter<formAdapter.MyViewHolder>
{
    private ArrayList<form> forms;
    private Context context;
    // Copiamos la lista de asistentes al array a nuestro atributo local
    public formAdapter(ArrayList<form> myDataset)
    {
        forms = myDataset;
    }
    @Override
    public formAdapter.MyViewHolder onCreateViewHolder(
(ViewGroup parent, int viewType)
    {
        View v = LayoutInflater.from(parent.
getContext()).inflate(R.layout.item, parent, false);
        MyViewHolder vh = new MyViewHolder(v);
        context = parent.getContext();
        return vh;
    }
    @Override
    public void onBindViewHolder(MyViewHolder holder, final int position)
    {
        holder.number.setText(String.valueOf(forms.
get(position).getInscrDate()));
        holder.name.setText(forms.get(position).getName());
        holder.show.setOnClickListener(new View.OnClickListener() {
            @Override
```

```

        public void onClick(View v) {
            int duration = Toast.LENGTH_LONG;
            Intent intent = new Intent(context.
                getApplicationContext(), attendee_view.class);
            //La colocamos en el paquete.
            Bundle bundle = new Bundle();
            //Rellenamos el paquete, el tipo de dato puesto
            //o clave si es un String, y el dato en cuestión.
            //Añadimos la información que queremos pasar.
            bundle.putString("id_attendee", forms.get(position).getId());
            //Añadimos el paquete al mensajero.
            intent.putExtras(bundle);
            //Cambiamos de actividad. El mensajero se va.
            context.startActivity(intent);
        }
    });
}
@Override
public int getItemCount()
{
    return forms.size();
}
public static class MyViewHolder extends RecyclerView.ViewHolder
{
    TextView number;
    TextView name;
    Button show;
    public MyViewHolder(View v)
    {
        super(v);
        number = (TextView) v.findViewById(R.id.number);
        name = (TextView) v.findViewById(R.id.name_item_text);
        show = (Button) v.findViewById(R.id.show);
    }
}
}

```

■ ClickListener.java

```

package es.uca.android.application.ImportantDates.ClickListener;

import android.content.Context;
import android.view.View;
import android.widget.Toast;

public class ClickListener implements RecyclerViewClickListener
{

```



```

    private Context context;
    private String text = "";

    public ClickListener(Context context)
    {
        this.context = context;
    }

    public Context getContext()
    {
        return this.context;
    }

    public void onClick(View v)
    {
        Toast.makeText(this.context, this.text, Toast.LENGTH_SHORT).show();
    }

    public void setText(String text)
    {
        this.text = text;
    }
    public String getText() { return this.text; }
}

```

■ RecyclerViewClickListener.java

```

package es.uca.android.application.ImportantDates.ClickListener;

import android.content.Context;
import android.view.View;

public interface RecyclerViewClickListener
{
    void onClick(View v);
    Context getContext();
}

```

■ FirstClickListener.java, SecondClickListener.java y ThirdClickListener.java

```

package es.uca.android.application.ImportantDates.ClickListener;

import android.content.Context;

public class FirstClickListener
    extends ClickListener
    implements RecyclerViewClickListener

```

```

{
    public FirstClickListener(Context context)
    {
        super(context);
    }
}
package es.uca.android.application.ImportantDates.ClickListener;

import android.content.Context;
import android.view.View;

import com.google.android.material.snackbar.Snackbar;

public class SecondClickListener
extends ClickListener
implements RecyclerViewClickListener
{
    public SecondClickListener(Context context)
    {
        super(context);
    }

    public void onClick(View view)
    {
        Snackbar.make(view, this.getText(), Snackbar.LENGTH_SHORT).show();
    }
}
package es.uca.android.application.ImportantDates.ClickListener;

import android.app.NotificationChannel;
import android.app.NotificationManager;
import android.app.PendingIntent;
import android.app.TaskStackBuilder;
import android.content.Context;
import android.content.Intent;
import android.view.View;

import androidx.core.app.NotificationCompat;

import es.uca.android.application.R;
import es.uca.android.application.ImportantDates.ImportantDates;
import es.uca.android.application.Localization.Localization;

public class ThirdClickListener
extends ClickListener
implements RecyclerViewClickListener

```

```

{
    private String title;
    private String message;
    private String idEvent;

    public ThirdClickListener(
        Context context, String title,
        String message, String idEvent
    )
    {
        super(context);
        this.title = title;
        this.message = message;
        this.idEvent = idEvent;
    }

    public void onClick(View v)
    {
        Context ctx = this.getContext();

        int NOTIFICATION_ID = 001;
        NotificationManager notificationManager =
            (NotificationManager)
            ctx.getSystemService(Context.NOTIFICATION_SERVICE);
        String CHANNEL_ID = "cic_channel-001";

        if (android.os.Build.VERSION.SDK_INT >=
            android.os.Build.VERSION_CODES.O)
        {
            CharSequence name = "cic_channel";
            String Description = "Channel_for_push_notifications_of_app";
            int importance = NotificationManager.IMPORTANCE_HIGH;
            NotificationChannel mChannel =
                new NotificationChannel(CHANNEL_ID, name, importance);
            mChannel.setDescription(Description);
            mChannel.enableLights(true);
            // mChannel.setLightColor(Color.RED);
            mChannel.enableVibration(true);
            mChannel.setVibrationPattern(
                new long[]{100, 200, 300, 400, 500, 400, 300, 200, 400}
            );
            mChannel.setShowBadge(false);
            notificationManager.createNotificationChannel(mChannel);
        }

        NotificationCompat.Builder builder =

```

```

        new NotificationCompat.Builder(ctx, CHANNEL_ID)
            .setSmallIcon(R.mipmap.ic_launcher)
            .setContentTitle(this.title)
            .setContentText(this.message);

        Intent resultIntent = new Intent(ctx, Localization.class);
        resultIntent.putExtra("ID_EVENT", this.idEvent);
        TaskStackBuilder stackBuilder = TaskStackBuilder.create(ctx);
        stackBuilder.addParentStack(ImportantDates.class);
        stackBuilder.addNextIntent(resultIntent);
        PendingIntent resultPendingIntent =
            stackBuilder.getPendingIntent(
                0, PendingIntent.FLAG_UPDATE_CURRENT
            );
        builder.setContentIntent(resultPendingIntent);
        notificationManager.notify(NOTIFICATION_ID, builder.build());
    }
}

```

■ ViewClickListener

```

package es.uca.android_application.ImportantDates.RecyclerView;

import android.view.View;

import androidx.recyclerview.widget.RecyclerView;

import es.uca.android_application.
    ImportantDates.
    ClickListener.
    RecyclerViewClickListener;

public class ViewClickListener implements View.OnClickListener
{
    private RecyclerViewClickListener listener;
    private RecyclerView.ViewHolder vh;

    public ViewClickListener(
        RecyclerViewClickListener listener,
        RecyclerView.ViewHolder vh
    )
    {
        this.listener = listener;
        this.vh = vh;
    }

    @Override

```

```

        public void onClick(View v)
        {
            this.listener.onClick(v);
        }
    }

```

Como se puede ver a lo largo del código, la estructura de las clases es evidente.

En primer lugar, se crean las clases **Activity**, en segundo lugar se crean las clases encargadas de gestionar los **RecyclerView** y por último, se crean los **listener** encargados de la lógica de los eventos **onClick**, que son los únicos utilizados en este proyecto.

5. Widget

Para realizar el widget, de forma correcta, necesitamos exponer la clase encargada de la misma.

Así pues:

```

package es.uca.android.application.Widget;

import android.appwidget.AppWidgetManager;
import android.appwidget.AppWidgetProvider;
import android.content.Context;

public class WidgetProvider extends AppWidgetProvider
{
    @Override
    public void onUpdate(
        Context context,
        AppWidgetManager appWidgetManager,
        int [] appWidgetIds
    ) { }
}

```

Como se puede apreciar, dicha clase esta aparentemente vacía de lógica, pero es que para lo que nos piden en el enunciado del proyecto, es suficiente, ya que, tan solo nos piden que cuando se clique sobre dicho widget, se abra la aplicación. Y por defecto, los **Widget's en Android**, cuando se abren, **siempre abren la MainActivity**.

6. AndroidManifest.xml

Respecto a este apartado, mostraremos el código del **AndroidManifest.xml** y explicaremos el porqué del mismo.

Así pues:

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://
schemas.android.com/apk/res/android"
    package="es.uca.android.application">

    <uses-permission android:name="android.permission.INTERNET" />
    <uses-permission android:name="android.permission.ACCESS_NETWORK_STATE" />

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:networkSecurityConfig="@xml/network_security_config"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportRtl="true"
        android:theme="@style/AppTheme"
        android:usesCleartextTraffic="true">

        <receiver android:name=".Widget.WidgetProvider" >
            <intent-filter >
                <action
                    android:name="android.appwidget.action.APPWIDGET_UPDATE" />
            </intent-filter >
            <meta-data android:name="android.appwidget.provider"
                android:resource="@xml/widget" />
        </receiver>

        <meta-data
            android:name="com.google.android.gms.version"
            android:value="@integer/google_play_services_version" />
        <meta-data
            android:name="com.google.android.geo.API_KEY"
            android:value="@string/google_maps_key" />

        <activity android:name=".Program.program" />
        <activity android:name=".EventAttendees.change_attendee" />
        <activity android:name=".EventAttendees.attendee_view" />
        <activity android:name=".EventAttendees.form_view" />
        <activity android:name=".EventAttendees.event_attendees" />
        <activity android:name=".ImportantDates.ImportantDates" />
        <activity android:name=".Localization.Localization" />
        <activity android:name=".MainActivity">
            <intent-filter >
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter >
        </activity>
    </application>
</manifest>

```

```

        </intent-filter>
    </activity>
</application>
</manifest>

```

En este archivo **AndroidManifest.xml** se pueden ver varias cosas, entre ellas, que Android para poder usar acceso a internet, se necesitan pedir los permisos por defecto.

Por otra parte, para usar los servicios de Google Maps, también se necesita pedir permiso de forma explícita e indicar las claves de acceso mediante instrucciones específicas dentro de este fichero.

Por otra parte, se necesita también declarar cada una de las actividades a usar dentro de la aplicación, incluyendo la main y también el uso del Widget, cuyo funcionamiento hemos explicado en el apartado anterior dentro de este proyecto.

7. Resources

Respecto a este apartado, pondremos cada uno de los archivos xml creados para el correcto funcionamiento de la aplicación. Así pues:

- res.layout.activity_attendee_view.xml

```

<?xml version="1.0" encoding="utf-8"?>
<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:id="@+id/general_form2"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".EventAttendees.attendee_view">

    <TextView
        android:id="@+id/name_text2"
        android:layout_width="86dp"
        android:layout_height="35dp"
        android:layout_marginStart="41dp"
        android:layout_marginTop="17dp"
        android:text="Nombre"
        android:textSize="16.0dip"

        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/title_attendee" />

    <TextView

```

```

        android:id="@+id/title_attendee"
        android:layout_width="173dp"
        android:layout_height="29dp"
        android:layout_marginStart="108dp"
        android:layout_marginTop="24dp"
        android:gravity="center"
        android:text="Ficha_de_asistente"
        android:textSize="16.0 dip"
        android:textStyle="bold|italic"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

<TextView
    android:id="@+id/dd_text2"
    android:layout_width="88dp"
    android:layout_height="20dp"
    android:layout_marginStart="41dp"
    android:layout_marginTop="17dp"
    android:text="Fech._salida"
    android:textSize="16.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/ad_text2" />

<TextView
    android:id="@+id/dni_text2"
    android:layout_width="88dp"
    android:layout_height="22dp"
    android:layout_marginStart="41dp"
    android:layout_marginTop="14dp"
    android:text="DNI"
    android:textSize="16.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/dd_text2" />

<TextView
    android:id="@+id/phone_text2"
    android:layout_width="93dp"
    android:layout_height="24dp"
    android:layout_marginStart="41dp"
    android:layout_marginTop="16dp"
    android:text="Tel_fono"
    android:textSize="16.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/dni_text2" />

<TextView

```



```

        android:id="@+id/bd_text2"
        android:layout_width="93dp"
        android:layout_height="22dp"
        android:layout_marginStart="43dp"
        android:layout_marginTop="9dp"
        android:text="F. _nac."
        android:textSize="16.0 dip"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/phone_text2" />

```

```

<TextView
    android:id="@+id/id_text2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="43dp"
    android:layout_marginTop="15dp"
    android:text="F. _inscr."
    android:textSize="16.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/bd_text2" />

```

```

<TextView
    android:id="@+id/name_text2_1"
    android:layout_width="143dp"
    android:layout_height="34dp"
    android:layout_marginStart="34dp"
    android:layout_marginTop="18dp"
    android:textSize="16.0 dip"
    app:layout_constraintStart_toEndOf="@+id/name_text2"
    app:layout_constraintTop_toBottomOf="@+id/title_attendee" />

```

```

<TextView
    android:id="@+id/surnames_text2"
    android:layout_width="85dp"
    android:layout_height="29dp"
    android:layout_marginStart="41dp"
    android:layout_marginTop="16dp"
    android:text="Apellidos"
    android:textSize="16.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/name_text2" />

```

```

<TextView
    android:id="@+id/surnames_text2_1"
    android:layout_width="144dp"
    android:layout_height="29dp"

```

```

        android:layout_marginStart="34dp"
        android:layout_marginTop="16dp"
        android:textSize="16.0 dip"
        app:layout_constraintStart_toEndOf="@+id/surnames_text2"
        app:layout_constraintTop_toBottomOf="@+id/name_text2_1" />

<TextView
    android:id="@+id/email_text3"
    android:layout_width="87dp"
    android:layout_height="23dp"
    android:layout_marginStart="41dp"
    android:layout_marginTop="15dp"
    android:text="Email"
    android:textSize="16.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/surnames_text2" />

<TextView
    android:id="@+id/email_text2_1"
    android:layout_width="143dp"
    android:layout_height="29dp"
    android:layout_marginStart="33dp"
    android:layout_marginTop="9dp"
    android:textSize="16.0 dip"
    app:layout_constraintStart_toEndOf="@+id/email_text3"
    app:layout_constraintTop_toBottomOf="@+id/surnames_text2_1" />

<TextView
    android:id="@+id/ad_text2"
    android:layout_width="85dp"
    android:layout_height="24dp"
    android:layout_marginStart="41dp"
    android:layout_marginTop="13dp"
    android:text="Fech. _llegada"
    android:textSize="16.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/email_text3" />

<TextView
    android:id="@+id/ad_text2_1"
    android:layout_width="146dp"
    android:layout_height="26dp"
    android:layout_marginStart="34dp"
    android:layout_marginTop="13dp"
    android:textSize="16.0 dip"
    app:layout_constraintStart_toEndOf="@+id/ad_text2"

```

```

        app:layout_constraintTop_toBottomOf="@+id/email_text2_1" />

<TextView
    android:id="@+id/dd_text2_1"
    android:layout_width="146dp"
    android:layout_height="21dp"
    android:layout_marginStart="31dp"
    android:layout_marginTop="15dp"
    android:textSize="16.0 dip"
    app:layout_constraintStart_toEndOf="@+id/dd_text2"
    app:layout_constraintTop_toBottomOf="@+id/ad_text2_1" />

<TextView
    android:id="@+id/dni_text2_1"
    android:layout_width="147dp"
    android:layout_height="21dp"
    android:layout_marginStart="31dp"
    android:layout_marginTop="13dp"
    android:textSize="16.0 dip"
    app:layout_constraintStart_toEndOf="@+id/dni_text2"
    app:layout_constraintTop_toBottomOf="@+id/dd_text2_1" />

<TextView
    android:id="@+id/phone_text2_1"
    android:layout_width="145dp"
    android:layout_height="19dp"
    android:layout_marginStart="27dp"
    android:layout_marginTop="17dp"
    android:textSize="16.0 dip"
    app:layout_constraintStart_toEndOf="@+id/phone_text2"
    app:layout_constraintTop_toBottomOf="@+id/dni_text2_1" />

<TextView
    android:id="@+id/bd_text2_1"
    android:layout_width="144dp"
    android:layout_height="18dp"
    android:layout_marginStart="24dp"
    android:layout_marginTop="17dp"
    android:textSize="16.0 dip"
    app:layout_constraintStart_toEndOf="@+id/bd_text2"
    app:layout_constraintTop_toBottomOf="@+id/phone_text2_1" />

<TextView
    android:id="@+id/id_text2_1"
    android:layout_width="149dp"

```

```

        android:layout_height="31dp"
        android:layout_marginStart="60dp"
        android:layout_marginTop="16dp"
        android:textSize="16.0 dip"
        app:layout_constraintStart_toEndOf="@+id/id_text2"
        app:layout_constraintTop_toBottomOf="@+id/bd_text2_1" />

<androidx.constraintlayout.widget.ConstraintLayout
    android:layout_width="411dp"
    android:layout_height="52dp"
    android:layout_marginTop="148dp"
    android:background="@color/colorPrimary"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/id_text2">

    <Button
        android:id="@+id/delete_form2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:background="@color/colorPrimary"
        android:text="Eliminar"
        android:textColor="@android:color/white"
        app:layout_constraintStart_toEndOf="@+id/put_form2"
        app:layout_constraintTop_toTopOf="parent" />

    <Button
        android:id="@+id/put_form2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="109dp"
        android:background="@color/colorPrimary"
        android:text="CAMBIAR"
        android:textColor="@android:color/white"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>

</androidx.constraintlayout.widget.ConstraintLayout>

```

■ res.layout.activity_change_attendee.xml

```

<?xml version="1.0" encoding="utf-8"?>
<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=".EventAttendees.form_view">

```

```

<TextView
    android:id="@+id/name_form_text3"
    android:layout_width="95dp"
    android:layout_height="37dp"
    android:layout_marginStart="24dp"
    android:layout_marginTop="12dp"
    android:text="Nombre"
    android:textSize="23.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/form_title3" />

```

```

<TextView
    android:id="@+id/surnames_text3"
    android:layout_width="95dp"
    android:layout_height="37dp"
    android:layout_marginStart="24dp"
    android:layout_marginTop="48dp"
    android:text="Apellidos"
    android:textSize="23.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/form_title3" />

```

```

<TextView
    android:id="@+id/email_text3"
    android:layout_width="95dp"
    android:layout_height="37dp"
    android:layout_marginStart="24dp"
    android:layout_marginTop="84dp"
    android:text="Email"
    android:textSize="23.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/form_title3" />

```

```

<TextView
    android:id="@+id/ad_text3"
    android:layout_width="103dp"
    android:layout_height="64dp"
    android:layout_marginStart="24dp"
    android:layout_marginTop="132dp"
    android:text="Fech. _llegada"
    android:textSize="23.0 dip"
    app:layout_constraintStart_toStartOf="parent"

```

```

        app:layout_constraintTop_toBottomOf="@+id/form_title3" />

<TextView
    android:id="@+id/dd_text3"
    android:layout_width="99dp"
    android:layout_height="58dp"
    android:layout_marginStart="24dp"
    android:layout_marginTop="204dp"
    android:text="Fech. _salida"
    android:textSize="23.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/form_title3" />

<TextView
    android:id="@+id/birth_text3"
    android:layout_width="95dp"
    android:layout_height="37dp"
    android:layout_marginStart="24dp"
    android:layout_marginTop="396dp"
    android:text="F. _nac. "
    android:textSize="23.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />

<EditText
    android:id="@+id/dni_form3"
    android:layout_width="209dp"
    android:layout_height="37dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="324dp"
    android:ems="10"
    android:hint="Introduzca _DNI. . . ."
    android:inputType="textPersonName"
    app:layout_constraintStart_toEndOf="@+id/dni_text3"
    app:layout_constraintTop_toTopOf="parent" />

<EditText
    android:id="@+id/surnames_form3"
    android:layout_width="211dp"
    android:layout_height="39dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="48dp"
    android:ems="10"
    android:hint="Introduzca _sus _apellidos .."
    android:inputType="textPersonName"
    app:layout_constraintStart_toEndOf="@+id/surnames_text3"

```

```

        app:layout_constraintTop_toBottomOf="@+id/form_title3" />

<EditText
    android:id="@+id/email_form3"
    android:layout_width="211dp"
    android:layout_height="39dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="84dp"
    android:ems="10"
    android:hint="Introduzca su email.."
    android:inputType="textPersonName"
    app:layout_constraintStart_toEndOf="@+id/email_text3"
    app:layout_constraintTop_toBottomOf="@+id/form_title3" />

<EditText
    android:id="@+id/ad_form3"
    android:layout_width="211dp"
    android:layout_height="39dp"
    android:layout_marginStart="8dp"
    android:layout_marginTop="132dp"
    android:ems="10"
    android:hint="Fecha de llegada.."
    android:inputType="textPersonName"
    app:layout_constraintStart_toEndOf="@+id/ad_text3"
    app:layout_constraintTop_toBottomOf="@+id/form_title3" />

<EditText
    android:id="@+id/dd_form3"
    android:layout_width="211dp"
    android:layout_height="39dp"
    android:layout_marginStart="12dp"
    android:layout_marginTop="204dp"
    android:ems="10"
    android:hint="Fecha de salida.."
    android:inputType="textPersonName"
    app:layout_constraintStart_toEndOf="@+id/dd_text3"
    app:layout_constraintTop_toBottomOf="@+id/form_title3" />

<EditText
    android:id="@+id/name_form3"
    android:layout_width="211dp"
    android:layout_height="39dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="12dp"
    android:ems="10"
    android:hint="Introduzca su nombre..."

```

```

        android:inputType="textPersonName"
        app:layout_constraintStart_toEndOf="@+id/name_form_text3"
        app:layout_constraintTop_toBottomOf="@+id/form_title3" />

<EditText
    android:id="@+id/date_form3"
    android:layout_width="209dp"
    android:layout_height="37dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="396dp"
    android:ems="10"
    android:hint="Introduzca _fech. _nac..."
    android:inputType="textPersonName"
    app:layout_constraintStart_toEndOf="@+id/birth_text3"
    app:layout_constraintTop_toTopOf="parent" />

<EditText
    android:id="@+id/phone_form3"
    android:layout_width="209dp"
    android:layout_height="37dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="360dp"
    android:ems="10"
    android:hint="Introduzca _su _num. _tel..."
    android:inputType="textPersonName"
    app:layout_constraintStart_toEndOf="@+id/phone_text3"
    app:layout_constraintTop_toTopOf="parent" />

<TextView
    android:id="@+id/phone_text3"
    android:layout_width="95dp"
    android:layout_height="37dp"
    android:layout_marginStart="24dp"
    android:layout_marginTop="360dp"
    android:text="Tel fono"
    android:textSize="23.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />

<TextView
    android:id="@+id/dni_text3"
    android:layout_width="95dp"
    android:layout_height="37dp"
    android:layout_marginStart="24dp"
    android:layout_marginTop="324dp"
    android:text="DNI"

```



```

        android:textSize="23.0dip"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

<TextView
    android:id="@+id/form_title3"
    android:layout_width="315dp"
    android:layout_height="30dp"
    android:layout_marginStart="44dp"
    android:layout_marginTop="16dp"
    android:gravity="center"
    android:text="Ficha de modificar del asistente"
    android:textSize="23.0dip"
    android:textStyle="bold|italic"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />

<Button
    android:id="@+id/send_button3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="172dp"
    android:layout_marginTop="60dp"
    android:background="@color/colorPrimary"
    android:text="Actualizar"
    android:textColor="@android:color/white"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/date_form3" />

</androidx.constraintlayout.widget.ConstraintLayout>

■ res.layout.activity_event_attendees.xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:http="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/activity_main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".MainActivity">

<androidx.recyclerview.widget.RecyclerView
    android:id="@+id/my_recycler_view"
    android:layout_width="match_parent"
    android:layout_height="557dp"

```

```

        android:scrollbars="vertical" />

<androidx.constraintlayout.widget.ConstraintLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:background="@color/colorPrimary"
>

    <Button
        android:id="@+id/add_button"
        android:layout_width="104dp"
        android:layout_height="60dp"
        android:layout_marginStart="152dp"
        android:background="@color/colorPrimary"
        android:gravity="center"
        android:scrollbars="vertical"
        android:text="@string/add_button"
        android:textColor="@android:color/white"
        http:layout_constraintStart_toStartOf="parent"
        http:layout_constraintTop_toTopOf="parent"
        tools:visibility="visible" />

</androidx.constraintlayout.widget.ConstraintLayout>

</LinearLayout>

```

■ res.layout.activity_form_view.xml

```

<?xml version="1.0" encoding="utf-8"?>
<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=".EventAttendees.form_view">
    <TextView
        android:id="@+id/name_form_text"
        android:layout_width="95dp"
        android:layout_height="37dp"
        android:layout_marginStart="24dp"
        android:layout_marginTop="12dp"
        android:text="Nombre"
        android:textSize="23.0 dip"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/form_title" />

```

```

<TextView
    android:id="@+id/surnames_text"
    android:layout_width="95dp"
    android:layout_height="37dp"
    android:layout_marginStart="24dp"
    android:layout_marginTop="48dp"
    android:text="Apellidos"
    android:textSize="23.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/form_title" />

<TextView
    android:id="@+id/email_text"
    android:layout_width="95dp"
    android:layout_height="37dp"
    android:layout_marginStart="24dp"
    android:layout_marginTop="84dp"
    android:text="Email"
    android:textSize="23.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/form_title" />

<TextView
    android:id="@+id/ad_text"
    android:layout_width="103dp"
    android:layout_height="64dp"
    android:layout_marginStart="24dp"
    android:layout_marginTop="132dp"
    android:text="Fech. _llegada"
    android:textSize="23.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/form_title" />

<TextView
    android:id="@+id/dd_text"
    android:layout_width="99dp"
    android:layout_height="58dp"
    android:layout_marginStart="24dp"
    android:layout_marginTop="204dp"
    android:text="Fech. _salida"
    android:textSize="23.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/form_title" />

<TextView

```

```

        android:id="@+id/birth_text"
        android:layout_width="95dp"
        android:layout_height="37dp"
        android:layout_marginStart="24dp"
        android:layout_marginTop="396dp"
        android:text="F. _nac."
        android:textSize="23.0 dip"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

```

```

<EditText
    android:id="@+id/dni_form"
    android:layout_width="209dp"
    android:layout_height="37dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="324dp"
    android:ems="10"
    android:hint="Introduzca _DNI..."
    android:inputType="textPersonName"
    app:layout_constraintStart_toEndOf="@+id/dni_text"
    app:layout_constraintTop_toTopOf="parent" />

```

```

<EditText
    android:id="@+id/surnames_form"
    android:layout_width="211dp"
    android:layout_height="39dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="48dp"
    android:ems="10"
    android:hint="Introduzca _sus _apellidos.."
    android:inputType="textPersonName"
    app:layout_constraintStart_toEndOf="@+id/surnames_text"
    app:layout_constraintTop_toBottomOf="@+id/form_title" />

```

```

<EditText
    android:id="@+id/email_form"
    android:layout_width="211dp"
    android:layout_height="39dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="84dp"
    android:ems="10"
    android:hint="Introduzca _su _email.."
    android:inputType="textPersonName"
    app:layout_constraintStart_toEndOf="@+id/email_text"
    app:layout_constraintTop_toBottomOf="@+id/form_title" />

```

```

<EditText
    android:id="@+id/ad_form"
    android:layout_width="211dp"
    android:layout_height="39dp"
    android:layout_marginStart="8dp"
    android:layout_marginTop="132dp"
    android:ems="10"
    android:hint="Fecha_de_llegada.."
    android:inputType="textPersonName"
    app:layout_constraintStart_toEndOf="@+id/ad_text"
    app:layout_constraintTop_toBottomOf="@+id/form_title" />

<EditText
    android:id="@+id/dd_form"
    android:layout_width="211dp"
    android:layout_height="39dp"
    android:layout_marginStart="12dp"
    android:layout_marginTop="204dp"
    android:ems="10"
    android:hint="Fecha_de_salida.."
    android:inputType="textPersonName"
    app:layout_constraintStart_toEndOf="@+id/dd_text"
    app:layout_constraintTop_toBottomOf="@+id/form_title" />

<EditText
    android:id="@+id/name_form"
    android:layout_width="211dp"
    android:layout_height="39dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="12dp"
    android:ems="10"
    android:hint="Introduzca_su_nombre..."
    android:inputType="textPersonName"
    app:layout_constraintStart_toEndOf="@+id/name_form_text"
    app:layout_constraintTop_toBottomOf="@+id/form_title" />

<EditText
    android:id="@+id/date_form"
    android:layout_width="209dp"
    android:layout_height="37dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="396dp"
    android:ems="10"
    android:hint="Introduzca_fecha_nac..."
    android:inputType="textPersonName"
    app:layout_constraintStart_toEndOf="@+id/birth_text"

```

```

        app:layout_constraintTop_toTopOf="parent" />

<EditText
    android:id="@+id/phone_form"
    android:layout_width="209dp"
    android:layout_height="37dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="360dp"
    android:ems="10"
    android:hint="Introduzca su num. tel.."
    android:inputType="textPersonName"
    app:layout_constraintStart_toEndOf="@+id/phone_text"
    app:layout_constraintTop_toTopOf="parent" />

<TextView
    android:id="@+id/phone_text"
    android:layout_width="95dp"
    android:layout_height="37dp"
    android:layout_marginStart="24dp"
    android:layout_marginTop="360dp"
    android:text="Tel fono"
    android:textSize="23.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />

<TextView
    android:id="@+id/dni_text"
    android:layout_width="95dp"
    android:layout_height="37dp"
    android:layout_marginStart="24dp"
    android:layout_marginTop="324dp"
    android:text="DNI"
    android:textSize="23.0 dip"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />

<TextView
    android:id="@+id/form_title"
    android:layout_width="319dp"
    android:layout_height="38dp"
    android:layout_marginStart="44dp"
    android:layout_marginTop="16dp"
    android:gravity="center"
    android:text="Formulario de asistencia"
    android:textSize="23.0 dip"
    android:textStyle="bold|italic"

```

```

        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

<Button
    android:id="@+id/send_button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="160dp"
    android:layout_marginTop="52dp"
    android:background="@color/colorPrimary"
    android:text="Enviar"
    android:textColor="@android:color/white"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/date_form" />

</androidx.constraintlayout.widget.ConstraintLayout>

```

- res.layout.activity_main.xml

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:http="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/activity_main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".MainActivity">

    <androidx.recyclerview.widget.RecyclerView
        android:id="@+id/my_recycler_view"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:scrollbars="vertical" />

</LinearLayout>

```
- res.layout.activity_program.xml

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:http="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/activity_main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".MainActivity">

```

```

<androidx.recyclerview.widget.RecyclerView
    android:id="@+id/recycler_view_program"
    android:layout_width="match_parent"
    android:layout_height="545dp">

</androidx.recyclerview.widget.RecyclerView>

<androidx.constraintlayout.widget.ConstraintLayout
    android:layout_width="821dp"
    android:layout_height="60dp"
    android:background="@color/colorPrimary"/>
</LinearLayout>

```

■ res.layout.image_button.xml

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:padding="16dp">

<androidx.cardview.widget.CardView
    android:id="@+id/cv"
    android:layout_width="match_parent"
    android:layout_height="wrap_content">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="horizontal"
        android:padding="5dp">

        <ImageButton android:id="@+id/ib"
            android:src="@drawable/ic_icon"
            android:background="@null"
            android:layout_width="match_parent"
            android:layout_height="match_parent" />

    </LinearLayout>
</androidx.cardview.widget.CardView>
</LinearLayout>

```

■ res.layout.important_dates.xml

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:http="http://schemas.android.com/apk/res-auto"

```



```

xmlns:tools="http://schemas.android.com/tools"
android:id="@+id/important_dates"
android:layout_width="match_parent"
android:layout_height="match_parent"
android:orientation="vertical"
tools:context=".ImportantDates.ImportantDates">

<androidx.recyclerview.widget.RecyclerView
    android:id="@+id/important_dates_recycler_view"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:scrollbars="vertical" />
</LinearLayout>

```

■ res.layout.item.xml

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:padding="16dp">

    <androidx.cardview.widget.CardView
        android:id="@+id/cv"
        android:layout_width="match_parent"
        android:layout_height="wrap_content">

        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:orientation="horizontal"
            android:padding="5dp">

            <TextView
                android:id="@+id/number"
                android:padding="5dp"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:layout_below="@+id/person_name"
                android:textSize="25sp" />

            <TextView
                android:id="@+id/name_item_text"
                android:padding="5dp"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:layout_weight="1"
                android:textColor="@color/colorPrimary"

```

```

        android:textSize="25sp" />
    <Button
        android:id="@+id/show"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:background="@color/colorAccent"
        android:minWidth="0dp"
        android:minHeight="0dp"
        android:padding="5dp"
        android:text="MOSTRAR"
        android:textColor="#FFF" />
    </LinearLayout>
</androidx.cardview.widget.CardView>
</LinearLayout>

```

■ res.layout.localization.xml

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:http="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/localization"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".Localization.Localization">

    <TextView
        android:id="@+id/description"
        android:layout_width="match_parent"
        android:layout_height="101dp"
        android:text="TextView" />

    <fragment
        android:id="@+id/map"
        android:name="com.google.android.gms.maps.SupportMapFragment"
        android:layout_width="match_parent"
        android:layout_height="631dp"
        tools:context=".Localization.Localization" />

</LinearLayout>

```

■ res.layout.program_item.xml

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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="wrap_content"
android:layout_height="wrap_content"
tools:context=".Program.program">

```

```

<TableLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:stretchColumns="*"
    android:layout_marginTop="20dp"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent">

```

```

<TableRow
    android:layout_width="match_parent"
    android:layout_height="match_parent">

```

```

<TextView
    android:id="@+id/program_title"
    android:layout_width="wrap_content"
    android:layout_height="30dp"
    android:layout_gravity="center"
    android:layout_span="2"
    android:text="MY_TITLE_(DAY)"
    android:textSize="16dp"
    android:textStyle="bold|italic" />

```

```

</TableRow>

```

```

<TableRow
    android:layout_width="fill_parent"
    android:layout_height="28dp">

```

```

<TextView
    android:id="@+id/program_hour1"
    android:layout_width="wrap_content"
    android:layout_height="30dp"
    android:layout_gravity="center"
    android:text="MY_TITLE_(DAY)" />

```

```

<TextView
    android:id="@+id/program_activity1"
    android:layout_width="40dp"
    android:layout_height="wrap_content"
    android:layout_gravity="center"

```

```

        android:text="MY_TITLE_(DAY)" />
</TableRow>

<View
    android:layout_height="2dp"
    android:background="@color/colorPrimary" />

<TableRow
    android:layout_width="fill_parent"
    android:layout_height="20dp">

    <TextView
        android:id="@+id/program_hour2"
        android:layout_width="wrap_content"
        android:layout_height="30dp"
        android:layout_gravity="center"
        android:text="MY_TITLE_(DAY)" />

    <TextView
        android:id="@+id/program_activity2"
        android:layout_width="40dp"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:text="MY_TITLE_(DAY)" />
</TableRow>

<View
    android:layout_height="2dp"
    android:background="@color/colorPrimary" />

<TableRow
    android:layout_width="fill_parent"
    android:layout_height="20dp">

    <TextView
        android:id="@+id/program_hour3"
        android:layout_width="wrap_content"
        android:layout_height="30dp"
        android:layout_gravity="center"
        android:text="MY_TITLE_(DAY)" />

    <TextView
        android:id="@+id/program_activity3"
        android:layout_width="40dp"
        android:layout_height="wrap_content"
        android:layout_gravity="center"

```

```

        android:text="MY_TITLE_(DAY)" />
</TableRow>

<View
    android:layout_height="2dp"
    android:background="@color/colorPrimary" />

<TableRow
    android:layout_width="fill_parent"
    android:layout_height="fill_parent">

    <TextView
        android:id="@+id/program_hour4"
        android:layout_width="wrap_content"
        android:layout_height="30dp"
        android:layout_gravity="center"
        android:text="MY_TITLE_(DAY)" />

    <TextView
        android:id="@+id/program_activity4"
        android:layout_width="40dp"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:text="MY_TITLE_(DAY)" />
</TableRow>

<View
    android:layout_height="2dp"
    android:background="@color/colorPrimary" />

<TableRow
    android:layout_width="fill_parent"
    android:layout_height="fill_parent">

    <TextView
        android:id="@+id/program_hour5"
        android:layout_width="wrap_content"
        android:layout_height="30dp"
        android:layout_gravity="center"
        android:text="MY_TITLE_(DAY)" />

    <TextView
        android:id="@+id/program_activity5"
        android:layout_width="40dp"
        android:layout_height="wrap_content"
        android:layout_gravity="center"

```

```

        android:text="MY_TITLE_(DAY)" />
</TableRow>

<View
    android:layout_height="2dp"
    android:background="@color/colorPrimary" />

<TableRow
    android:layout_width="fill_parent"
    android:layout_height="fill_parent">

    <TextView
        android:id="@+id/program_hour6"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:text="MY_TITLE_(DAY)" />

    <TextView
        android:id="@+id/program_activity6"
        android:layout_width="40dp"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:text="MY_TITLE_(DAY)" />
</TableRow>

<View
    android:layout_height="2dp"
    android:background="@color/colorPrimary" />
</TableLayout>

</LinearLayout>

```

■ res.layout.widget.xml

```

<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/widget"
    android:orientation="horizontal"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="#55000000">

    <ImageView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:src="@mipmap/logo_foreground"

```

```

        android:scaleType="centerCrop" />

</RelativeLayout>
■ res.menu.main_menu.xml
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto">
    <item
        android:id="@+id/main_menu"
        android:icon="@drawable/ic_icon"
        android:title="Main Menu"
        app:showAsAction="ifRoom">

    </menu>
    <item
        android:id="@+id/item1"
        android:icon="@drawable/ic_icon"
        android:title="Asistentes al evento."
        app:showAsAction="never"
        />

    <item
        android:id="@+id/item2"
        android:icon="@drawable/ic_icon"
        android:title="Programa."
        app:showAsAction="never"
        />

    <item
        android:id="@+id/item3"
        android:icon="@drawable/ic_icon"
        android:title="Fechas importantes."
        app:showAsAction="never"
        />

    <item
        android:id="@+id/item4"
        android:icon="@drawable/ic_icon"
        android:title="Localización."
        app:showAsAction="never"
        />
    </menu>
</item>
</menu>

```

- res.xml.widget.xml

```
<?xml version="1.0" encoding="utf-8"?>
<appwidget-provider xmlns:android="http://
schemas.android.com/apk/res/android"
    android:minWidth="120dp"
    android:minHeight="60dp"
    android:updatePeriodMillis="1800000"
    android:initialLayout="@layout/widget"
    android:initialKeyguardLayout="@layout/widget"
    android:resizeMode="horizontal|vertical"
    android:widgetCategory="home_screen|keyguard"
    android:previewImage="@mipmap/logo">
</appwidget-provider>
```

- res.xml.network_security_config.xml

```
<?xml version="1.0" encoding="utf-8"?>
<network-security-config>
    <domain-config cleartextTrafficPermitted="true">
        <domain includeSubdomains="true">10.0.2.2</domain>
    </domain-config>
</network-security-config>
```

- res.values.colors.xml

```
<?xml version="1.0" encoding="utf-8"?>
<resources>
    <color name="colorPrimary">#802929</color>
    <color name="colorPrimaryDark">#802929</color>
    <color name="colorAccent">#03DAC5</color>
</resources>
```

- res.values.dimens.xml

```
<?xml version="1.0" encoding="utf-8"?>
<resources>
    <dimen name="widget_margin">8dp</dimen>
</resources>
```

- res.values.integers.xml

```
<?xml version="1.0" encoding="utf-8"?>
<resources>
    <integer name="google_play_services_version">12451000</integer>
</resources>
```

- res.values.strings.xml


```

<resources>
    <string name="app_name">CIC App</string>
    <string name="add_button"> Voy !</string>
    <string name="name_text">Escribe aquí tu nombre.</string>
    <string name="google_maps_key">
        AIzaSyCvyTeUmLLJd2Byn2K0uZjaTyCIdTnq2Y0</string>
</resources>

```

- res.values.styles.xml

```

<resources>
    <!-- Base application theme. -->
    <style name="AppTheme" parent="Theme.AppCompat.Light.DarkActionBar">
        <!-- Customize your theme here. -->
        <item name="colorPrimary">@color/colorPrimary</item>
        <item name="colorPrimaryDark">@color/colorPrimaryDark</item>
        <item name="colorAccent">@color/colorAccent</item>
    </style>
</resources>

```

8. Gradle

Por último, ponemos los dos archivos build.gradle, tanto respecto a proyecto como a la app, para mostrar las librerías y compiladores específicos usados en este proyecto. Así pues:

- build.gradle (project)

```

// Top-level build file where you can add
// configuration options common to all sub-projects/modules.

buildscript {

    repositories {
        google()
        jcenter()
    }

    dependencies {
        classpath 'com.android.tools.build:gradle:3.6.3'
    }
}

allprojects {
    repositories {
        google()
    }
}

```

```

        jcenter()
    }
}

task clean(type: Delete) {
    delete rootProject.buildDir
}

■ build.gradle (app)
    apply plugin: 'com.android.application'

    android
    {
        compileSdkVersion 29
        buildToolsVersion "29.0.3"

        defaultConfig
        {
            applicationId "es.uca.android.application"
            minSdkVersion 29
            targetSdkVersion 29
            versionCode 1
            versionName "1.0"

            testInstrumentationRunner "androidx.test.runner.AndroidJUnitRunner"
        }

        buildTypes
        {
            release
            {
                minifyEnabled false
                proguardFiles
                getDefaultProguardFile('proguard-android-optimize.txt'),
                'proguard-rules.pro'
            }
        }

        dependencies
        {
            implementation fileTree(dir: 'libs', include: ['*.jar'])

            implementation 'androidx.appcompat:appcompat:1.1.0'
            implementation 'androidx.constraintlayout:constraintlayout:1.1.3'
        }
    }
}

```

```

testImplementation 'junit:junit:4.12'
androidTestImplementation 'androidx.test.ext:junit:1.1.1'
androidTestImplementation 'androidx.test.espresso:espresso-core:3.2.0'
implementation "androidx.recyclerview:recyclerview:1.1.0"
implementation "androidx.recyclerview:recyclerview-selection:1.1.0-rc01"
implementation "androidx.cardview:cardview:1.0.0"
implementation 'com.google.android.material:material:1.0.0'
implementation 'com.google.android.gms:play-services-maps:17.0.0'
}

```

9. Conclusión

Las conclusiones sacadas a lo largo de la elaboración de este proyecto y de este tutorial, es que Android es una tecnología fascinante, con posibilidades enormes. Sin embargo, la capacidad de adaptación y desarrollo de funcionalidades concretas, dista mucho de ser algo fácil e intuitivo.

No por ello, se deba renegar de ello, aunque si dificulta verlo como la mejor opción cuando el rendimiento en tiempo es el tema mas acuciante.

Referencias

- [1] Android SDK documentation,
<https://developer.android.com/docs>
- [2] Heroku deployment documentation,
<https://devcenter.heroku.com/categories/reference>
- [3] Para consultar diversas dudas sobre el desarrollo,
<https://stackoverflow.com/>