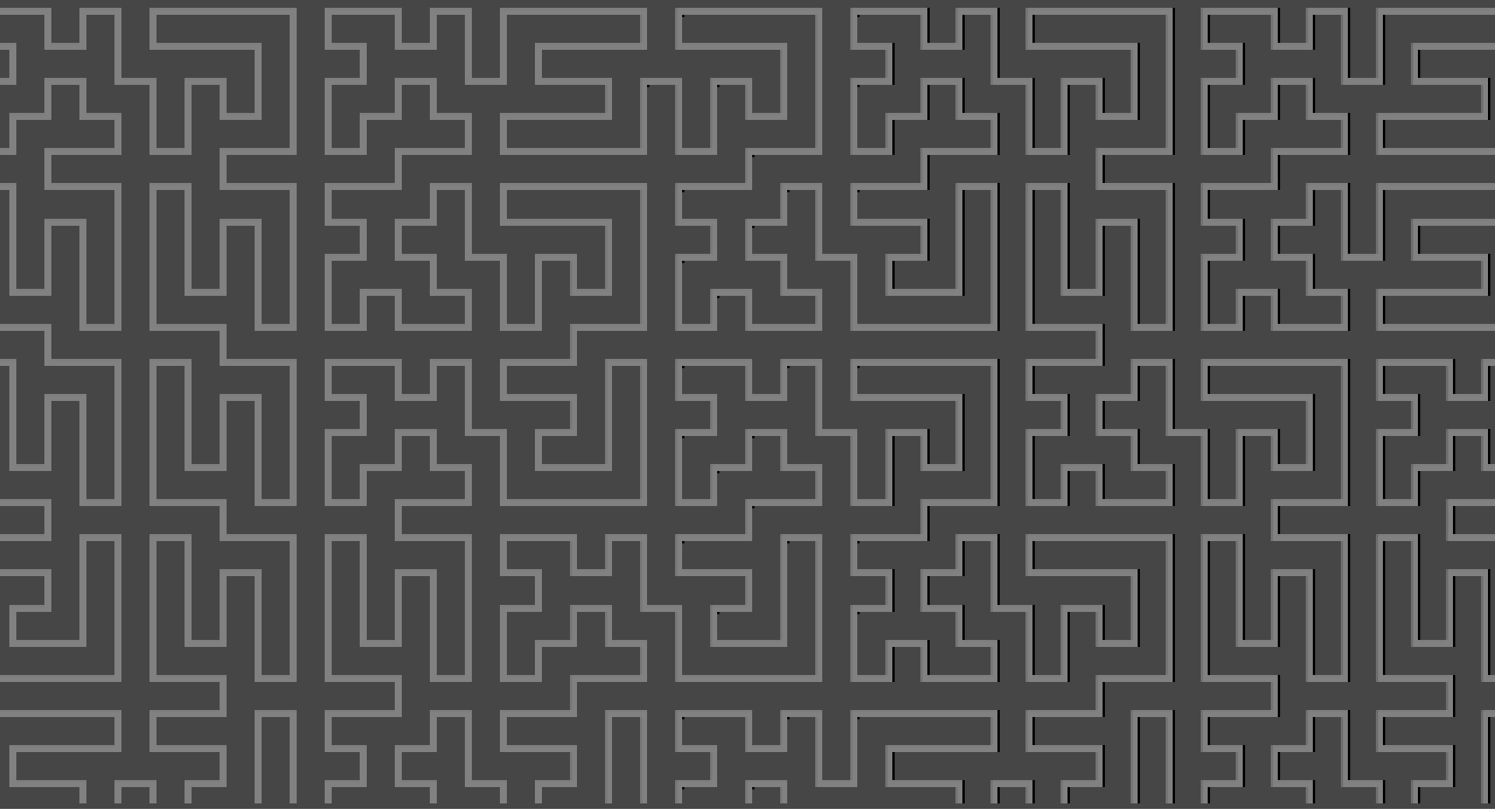
MOBILE DEVELOPMENT



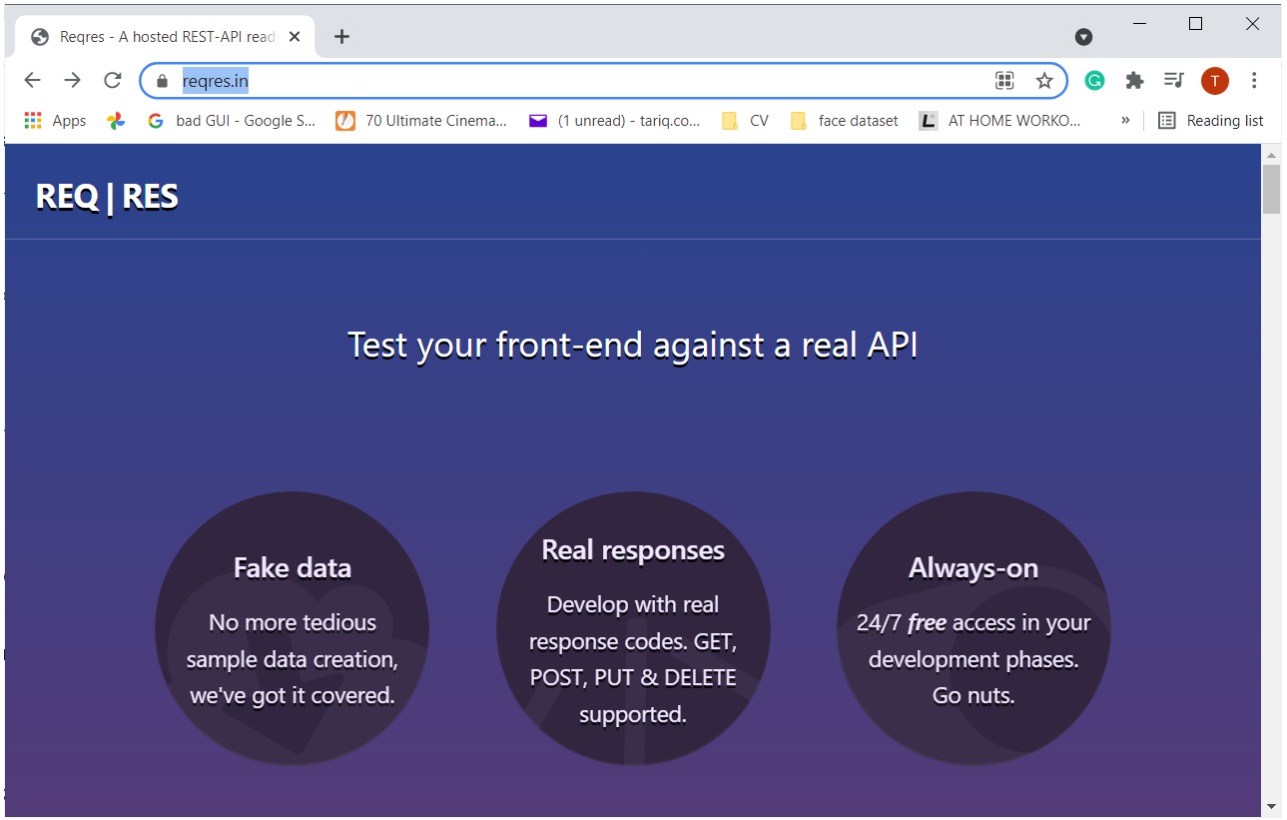
Web Services and JSON Using Volley

Web Services

- Google Volley library setup
- Open APIs – we will use apigeonet.org.nz
- Requests
- JSON Responses

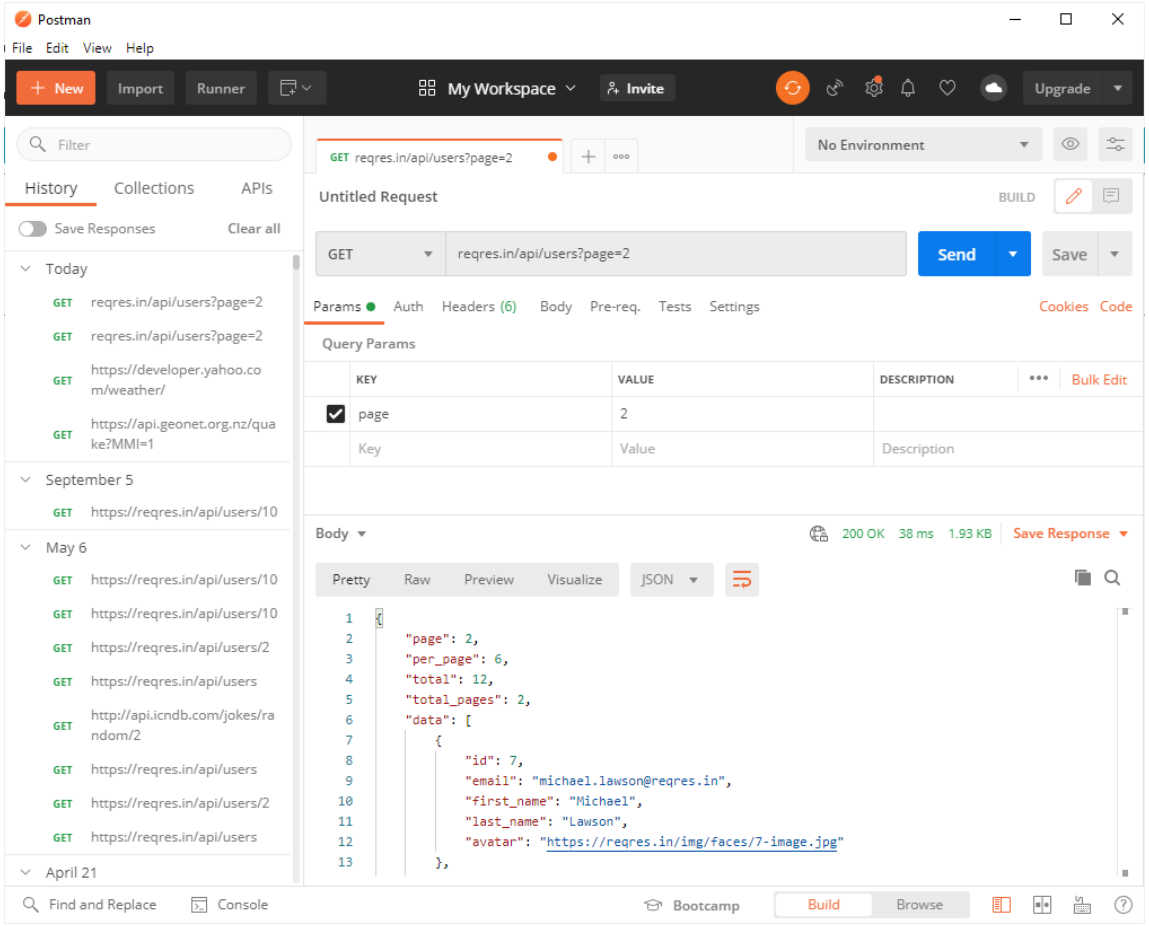
Review- Test API

- https://reqres.in/



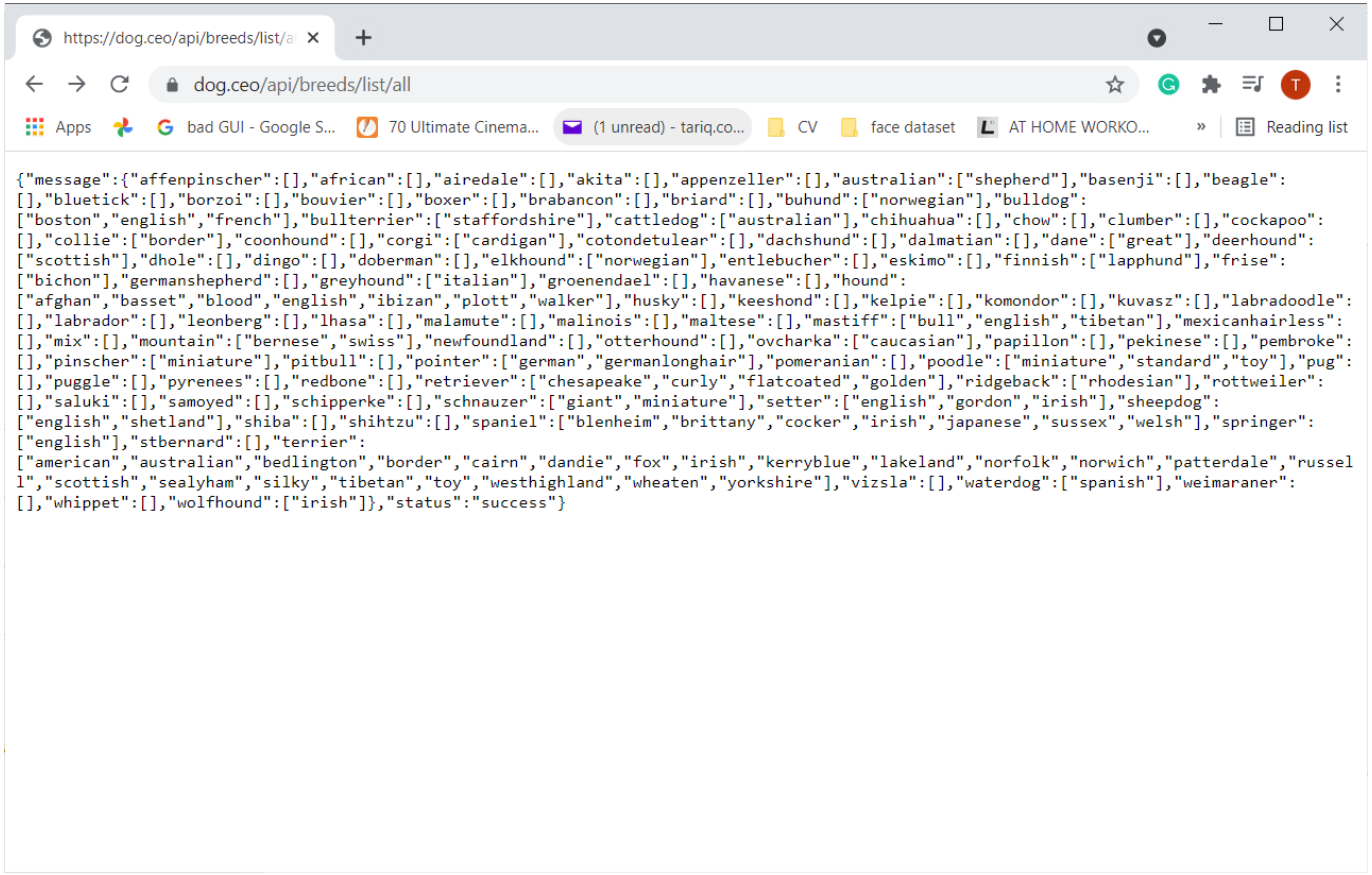
HTTP GET

- reqres.in/api/users?page=2



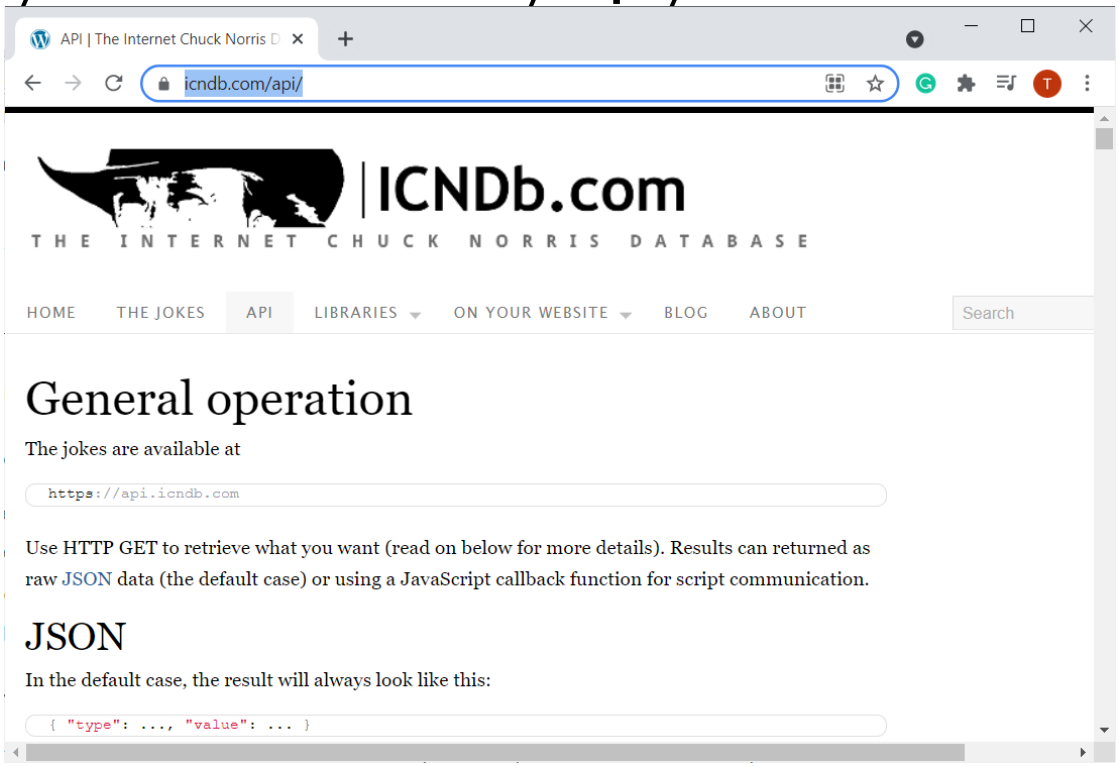
Dogs API

- https://dog.ceo/dog-api/



Jokes

- https://www.icndb.com/api/



JSON Properties

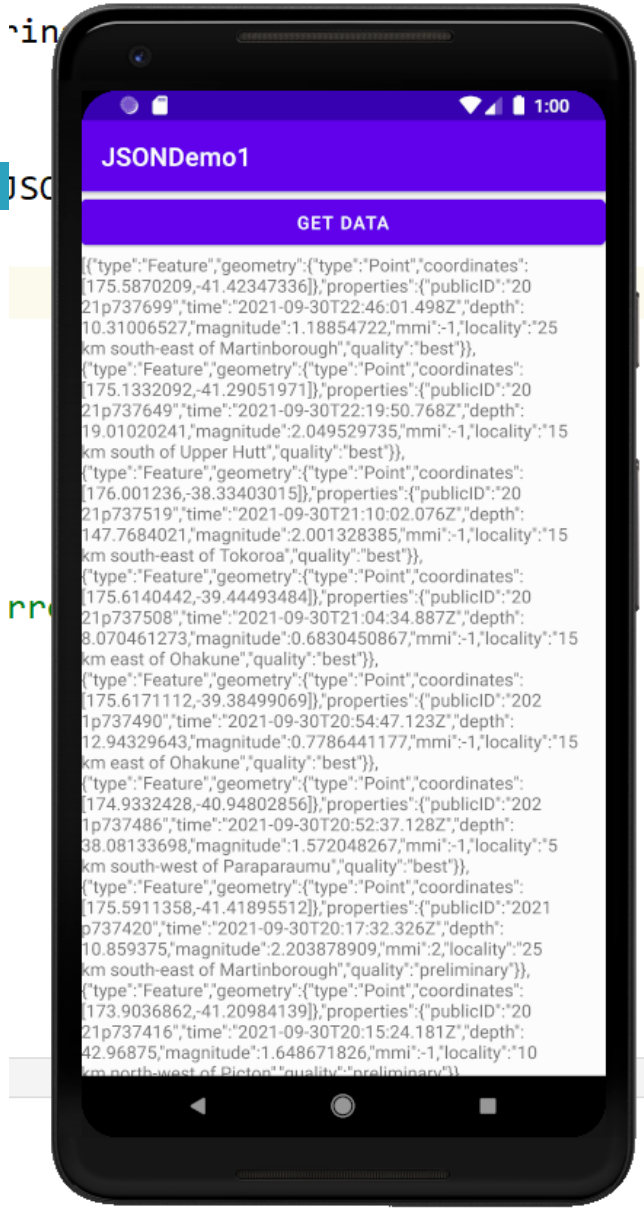
- Define objects and arrays with key value pairs
- Square brackets define arrays
- Curly Brackets define objects
- Key-values define object properties

```
[
   {
      "color":"red",
      "value":"#f00"
   },
   {
      "color":"green",
      "value":"#0f0"
   },
   {
      "color":"blue",
      "value":"#00f"
   },
   {
      "color":"cyan",
      "value":"#0ff"
   }
]
```

https://adobe.github.io/Spry/samples/data_region/JSONDataSetSample.html

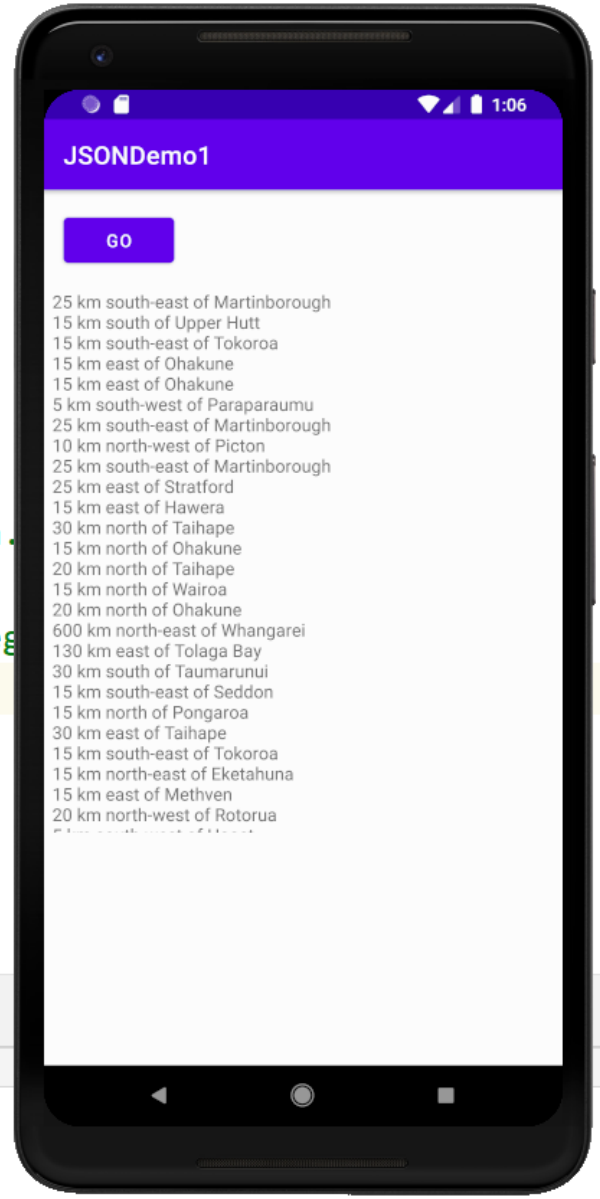
GeoNet App

- Just dumping the entire JSON response note the nesting of the of the server response



GeoNet Localities

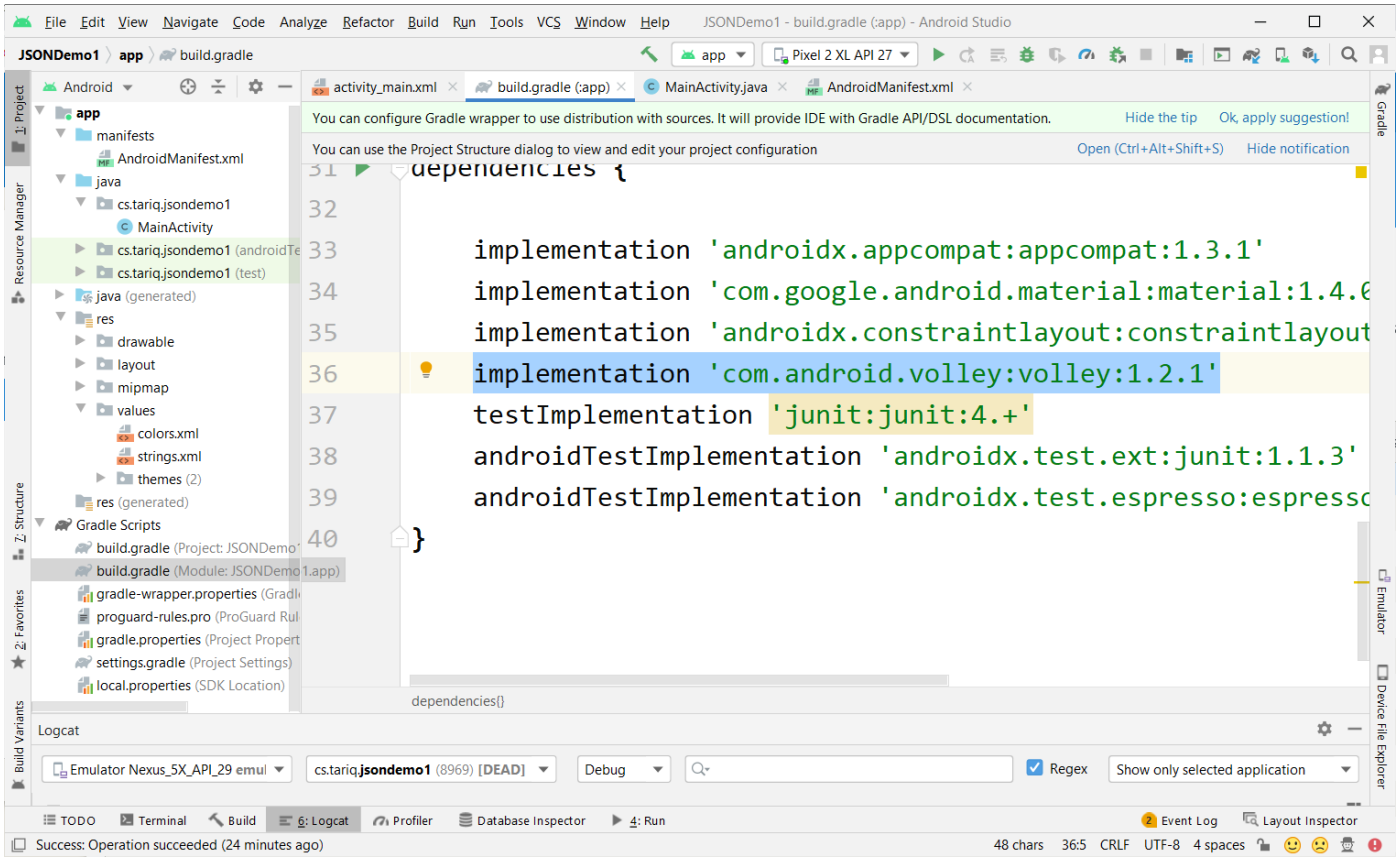
- Slice and dice the data to dig out the locality information from the array, and nested objects



Gradle

- Add new dependency to the bottom of your build.gradle file

```
implementation 'com.android.volley:volley:1.2.1'
```



Permissions

- uses-permission tags before application tags

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="cs.tariq.jsondemo1">


    <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:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.JSONDemo1">
        <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>
```

Create A Request Queue

- Automates the entire connection process
- Some frameworks are a lot more complicated
- Just use the Volley.newRequestQueue factory method to define a queue
- Need to
  - import com.android.volley.RequestQueue;
- Does all of the hard work of reading / writing requests across the socket

```
RequestQueue queue = Volley.newRequestQueue(getApplicationContext());
```

Create JSON Request

- Define the request object and add it to the request queue

```
String url ="https://api.geonet.org.nz/quake?MMI=7";

JsonObjectRequest jsObjRequest = new JsonObjectRequest
        (Request.Method.GET, url, null, new Response.Listener<JSONObject>() {
            @Override
            public void onResponse(JSONObject response) {

            }
        }, new Response.ErrorListener() {
            @Override
            public void onErrorResponse(VolleyError error) {

            }
});

// Add the request to the RequestQueue.
queue.add(jsObjRequest);
```

JSON Response Callback

- onResponse callback method does all of the work

```
new Response.Listener<JSONObject>() {

    @Override
    public void onResponse(JSONObject response) {

        StringBuilder localities = new StringBuilder();

        try {
            JSONArray data = response.getJSONArray("features");

            for(int index = 0; index < data.length(); index++)
            {
                JSONObject quake = data.getJSONObject(index);

                JSONObject properties = quake.getJSONObject("properties");
                localities.append(properties.getString("locality")+"\n");
            }

} catch (JSONException e) {
            e.printStackTrace();
        }
        output.setText(localities.toString());

    }
}
```

Exercise

- Add some extra code and UI elements to extract the magnitude and point co-ordinates
- Read through:
  - https://developer.android.com/training/volley
  - https://developer.android.com/training/volley/simple
  - https://developer.android.com/training/volley/requestqueue
  - https://developer.android.com/training/volley/request-custom
- Work on your assignment task