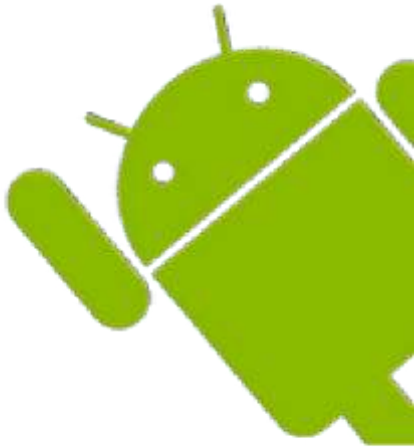
Mobile app development – week 8



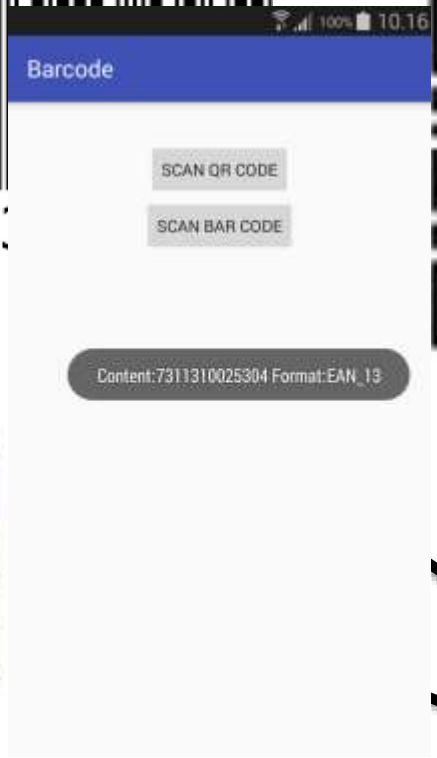
Guest lecture from ZIP-Q

Barcode, networking and JSON

Second Mandatory Assignment

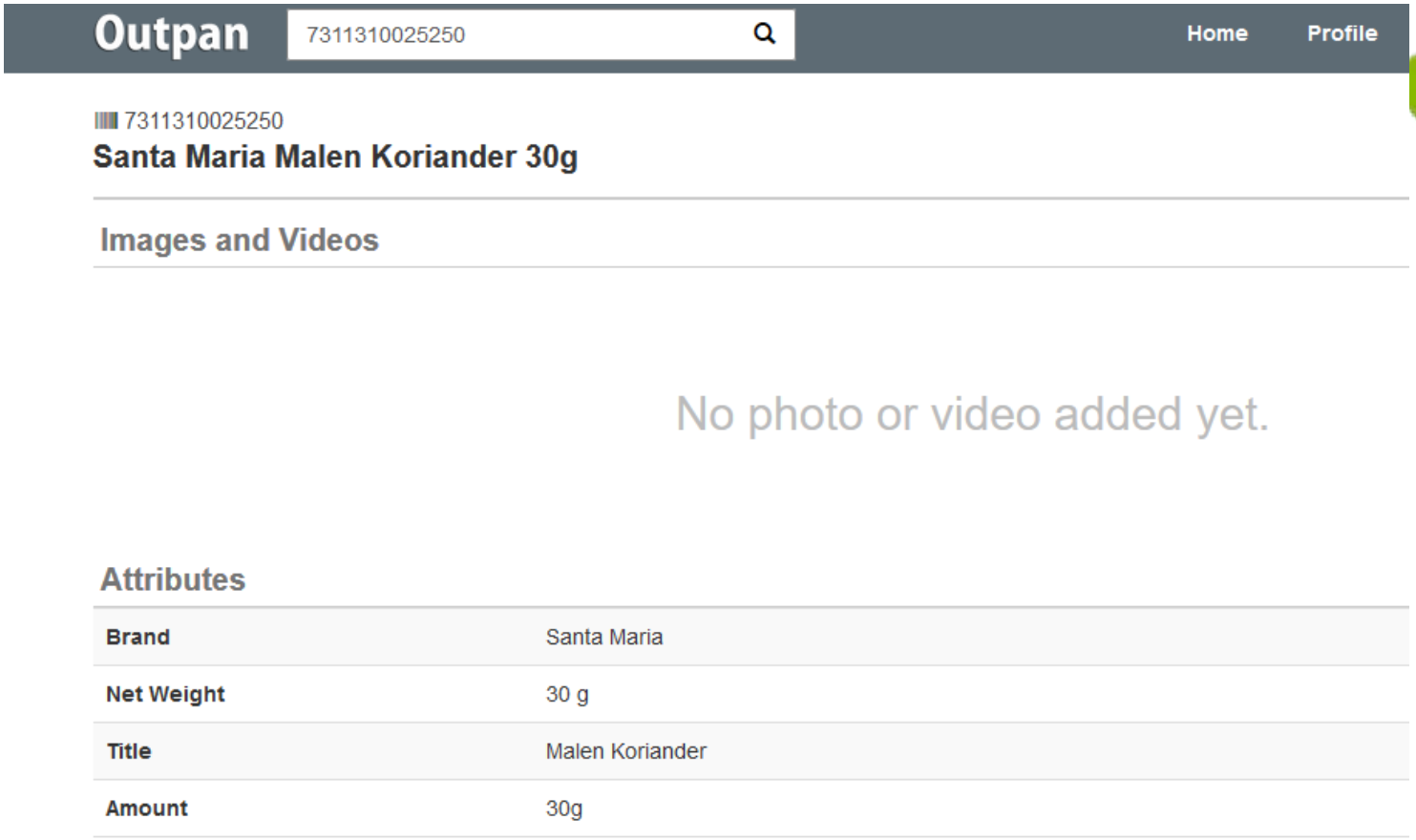
Exercises

Barcodes



unique id

Getting product info with the barcode



Shortcut:

https://www.outpan.com/view_product.php?barcode=7311310025250

Http communication from Android

Similar to Java,
but must be done in a background thread

Chapter 23 in the textbook

```
public class NetworkFetcher {
  public byte[] getProductInfo(String urlSpec) throws IOException {
  URL url = new URL(urlSpec);
  HttpURLConnection connection = (HttpURLConnection)url.openConnection();
        ...
     return out.toByteArray();
   } finally { connection.disconnect(); }
  }
}

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

Getting product info

```
private class FetchOutpanTask extends AsyncTask<String, Void, byte[] > {
  @Override
  protected byte[] doInBackground(String... params) {

    try {
       result = new NetworkFetcher()
                  .getProductInfo("https://www.outpan.com/ ... ”);
    } catch (IOException ioe) {…  }
    return result;
  }

  @Override
  protected void onPostExecute(byte[] result) {
      …
  }
}
```

Getting product info

```
private class FetchOutpanTask extends AsyncTask<String, Void, byte[] > {
  @Override
  protected byte[] doInBackground(String... params) {

    try {
       result = new NetworkFetcher()
                  .getProductInfo("https://www.outpan.com/ ... ");
    } catch (IOException ioe) {…  }
    return result;
  }

  @Override
  protected void onPostExecute(byte[] result) {
      …
  }
}
```

Robust networking

1. URL wrong, not responding, …

```
try {
    ...  getUrlBytes("https:// …");
} catch (IOException e) {
   return "Unable to retrieve web page. URL may be invalid.";
}
```

2. Missing Network connection

```
ConnectivityManager connMgr = (ConnectivityManager)
                        getSystemService(Context.CONNECTIVITY_SERVICE);
NetworkInfo networkInfo = connMgr.getActiveNetworkInfo();
if (networkInfo != null && networkInfo.isConnected()) {
         // fetch data
    } else {
         // display error
}
```

http://developer.android.com/reference/android/content/Context.html

Robust networking (2)

3. Network slow

```
HttpURLConnection conn= (HttpURLConnection)url.openConnection();
conn.setReadTimeout(10000 /* milliseconds */);
conn.setConnectTimeout(15000 /* milliseconds */);
conn.connect();
int response = conn.getResponseCode();

is = conn.getInputStream();
…
```

Read these carefully:

- http://developer.android.com/training/basics/network-ops/connecting.html
- http://developer.android.com/training/basics/network-ops/managing.html

Getting product info

Professional service available from GS1

http://gepir.gs1.org/v32/xx/gtin.aspx

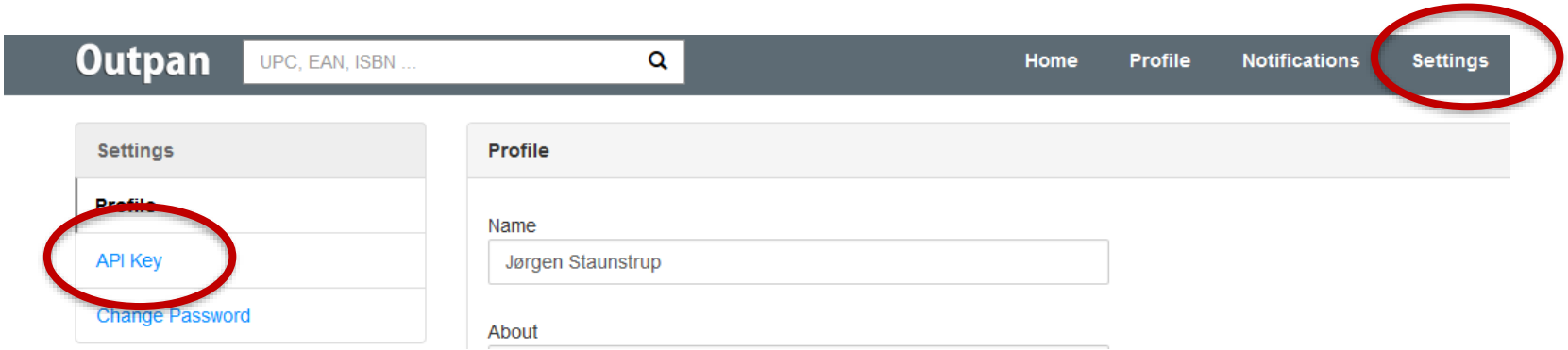
Free service available from outpan

http://www.outpan.com

https://www.outpan.com/view_product.php?barcode=7311310025250

Outpan

http://www.outpan.com



Using Outpan's API

https://www.outpan.com/developers.php

en - TV, Radi... Big Nerd Ranch Books ... Byvejr - Danmark Version2 Computerworld Google Maps Mit TDC TV-guide - Få styr på t...

Outpan UPC, EAN, ISBN ... Home Profile

API Documentation

Get Product Information

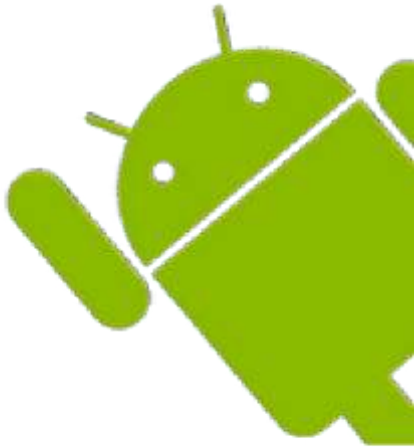
GET https://api.outpan.com/v2/products/[GTIN]?apikey=[YOUR API KEY]

https://api.outpan.com/v2/products/7311310025250/?apikey=0d...a31

use your own key


```
{
    "gtin": "7311310025250",
    "outpan_url": "https:\/\/www.outpan.com\/view_product.php?barcode=7311310025250",
    "name": "Santa Maria Malen Koriander 30g",
    "attributes": {
        "Amount": "30g",
        "Brand": "Santa Maria",
        "Net Weight": "30 g",
        "Title": "Malen Koriander"
    },
    "images": [

    ],
    "videos": [

    ],
    "categories": [

    ]
}
```

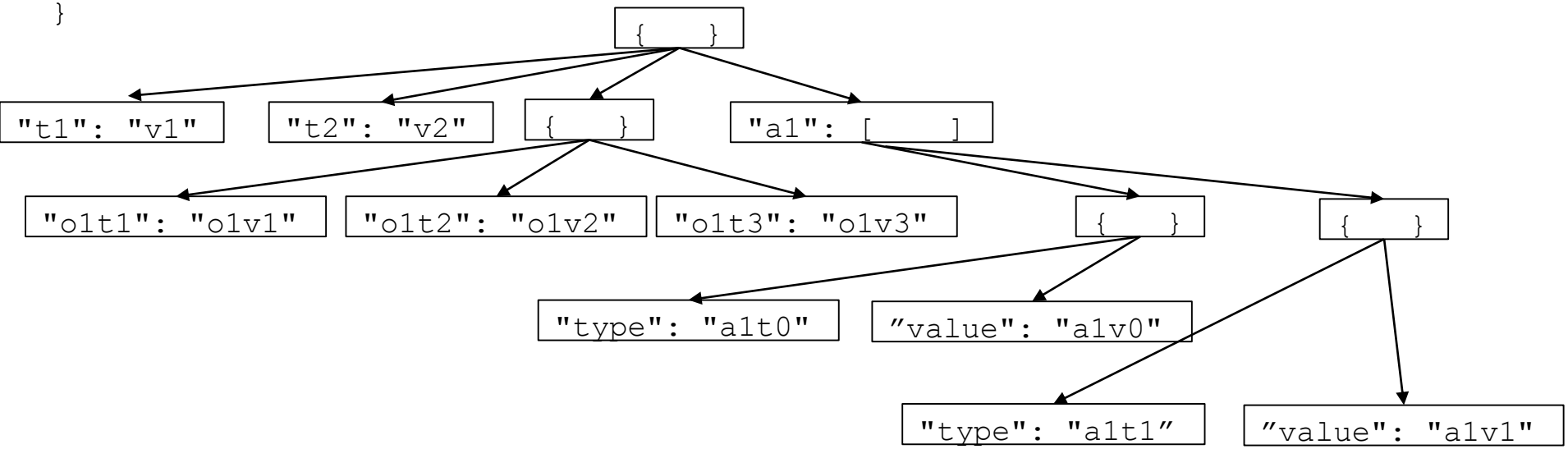
JSON



```
{
  "firstName": "John",
  "lastName": "Smith",
  "isAlive": true,
  "age": 25,
  "address": {
    "streetAddress": "21 2nd Street",
    "city": "New York",
    "state": "NY",
    "postalCode": "10021-3100"
  },
  "phoneNumbers": [
    {
      "type": "home",
      "number": "212 555-1234"
    },
    {
      "type": "office",
      "number": "646 555-4567"
    }
  ],
  "children": [],
  "spouse": null
}
```

JSON Object Model

```
{ "t1": "v1",
  "t2": "v2",
  "o1": { "o1t1": "o1v1",
    "o1t2": "o1v2",
    "o1t3": "o1v3",
  },
  "a1": [
    { "type":  "a1t0",
      "value": "a1v0"
    },
    { "type":  "a1t1",
      "value": "a1v1"
    }
  ]
}
```

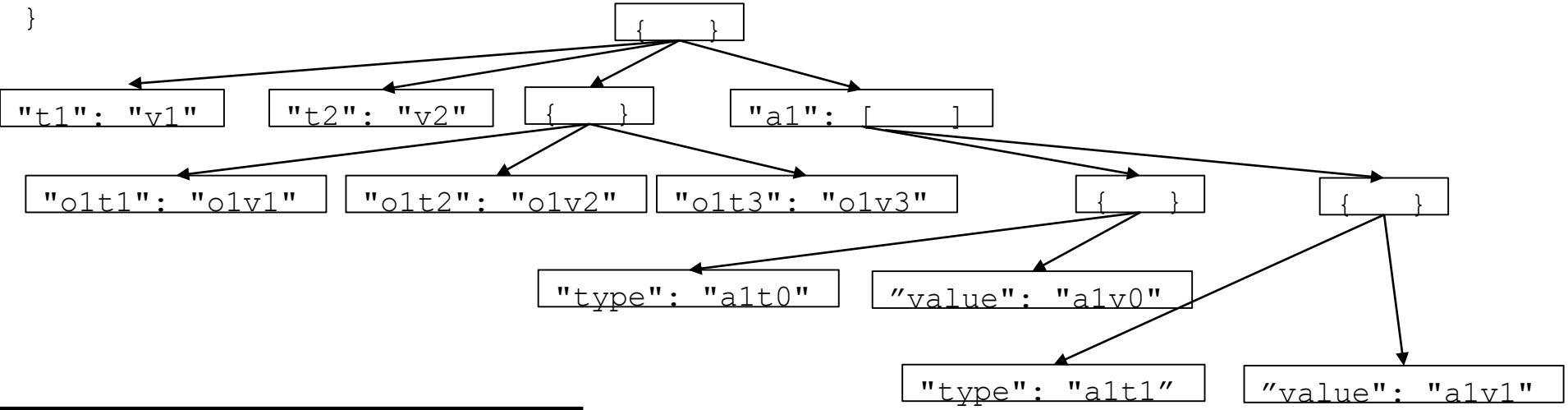


JSON – parsing (object model)

JSONObject JsB:

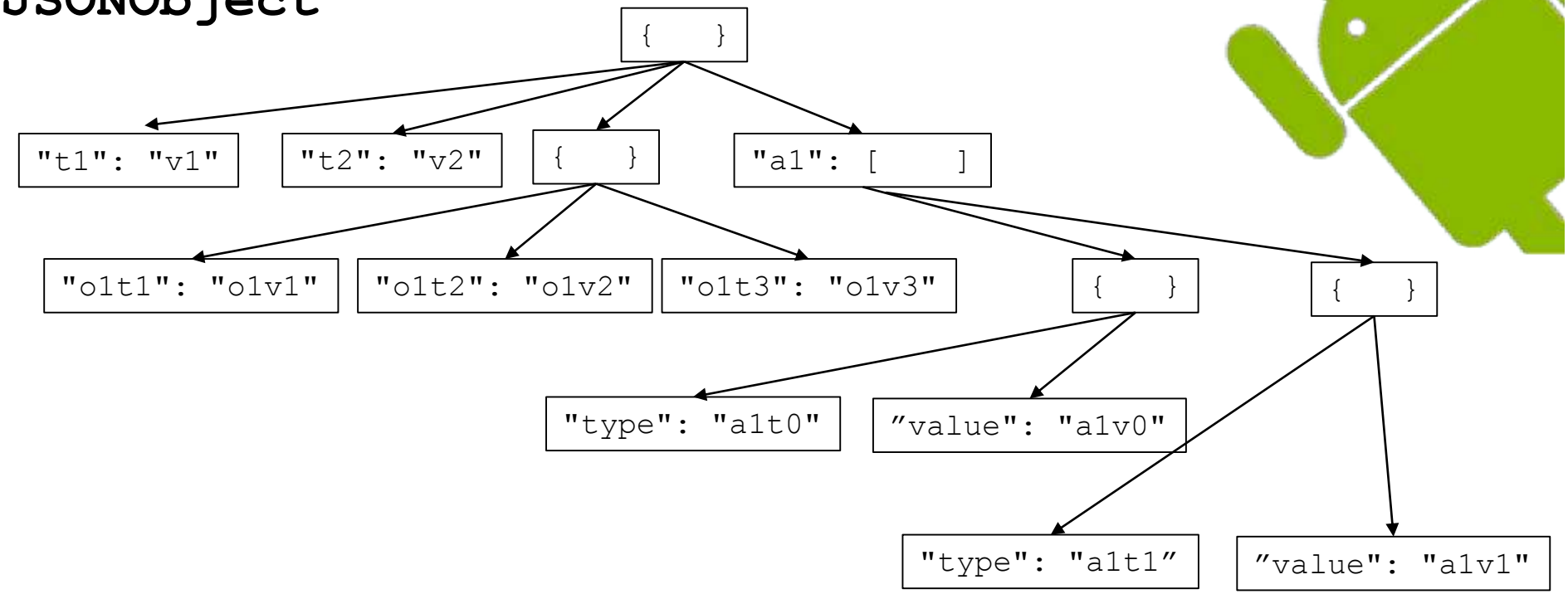
```
{ "t1": "v1",
  "t2": "v2",
  "o1": { "o1t1": "o1v1",
    "o1t2": "o1v2",
    "o1t3": "o1v3",
  },
  "a1": [
    { "type":  "a1t0",
      "value": "a1v0"
    },
    { "type":  "a1t1",
      "value": "a1v1"
    }
  ]
}
```

```
JsB.getString("t1") is "v1"

JsB.getJSONObject(”o1") is
    {
       "o1t1": "o1v1",
       "o1t2": "o1v2",
       "o1t3": "o1v3"
     }

JsB.getJSONObject("o1").getString("o1t1") is "o1v1",

JsB.getJSONArray("a1")
        .getJSONObject(0).getString("type") is "a1t0"
```



JSON Object versus Streaming model

JSONObject



JsonReader

http://developer.android.com/reference/android/util/JsonReader.html

```
{"t1":"v1","t2":"v2","o1":{"o1t1": "o1v1","o1t2": "o1v2","o1t3": "o1v3",},
          "a1":[{"type":"a1t0","value": "a1v0"},{"type":  "a1v1","value": "a1v2"}]}
```

… **nextName().equals(”t2”)** …

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https://api.outpan.com/v2/products/7311310025250/?apikey=0d...a31

use your own key

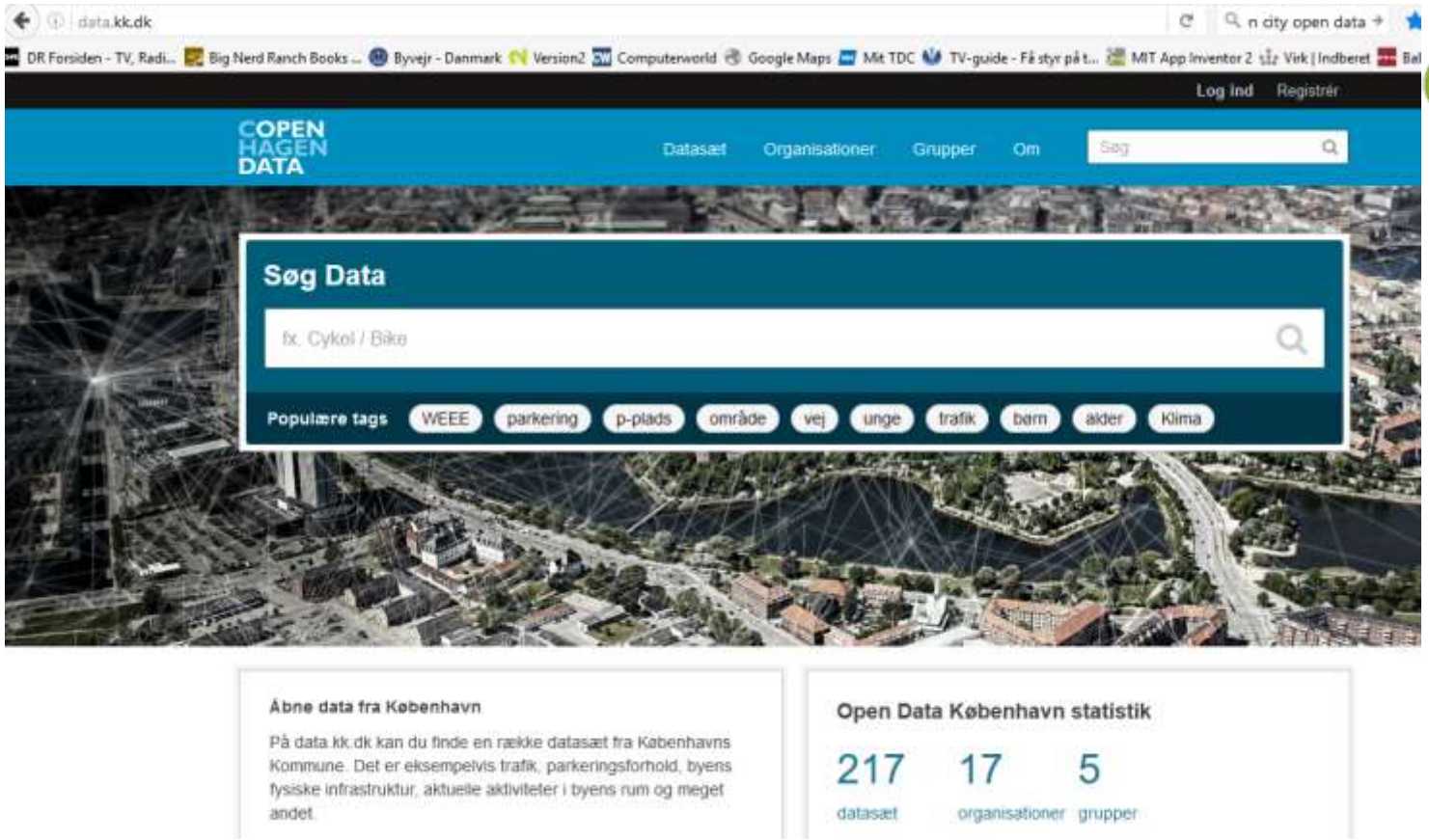

```
{
    "gtin": "7311310025250",
    "outpan_url": "https:\/\/www.outpan.com\/view_product.php?barcode=7311310025250",
    "name": "Santa Maria Malen Koriander 30g",
    "attributes": {
        "Amount": "30g",
        "Brand": "Santa Maria",
        "Net Weight": "30 g",
        "Title": "Malen Koriander"
    },
    "images": [

    ],
    "videos": [

    ],
    "categories": [

    ]
}
```

Copenhagen City Open Data

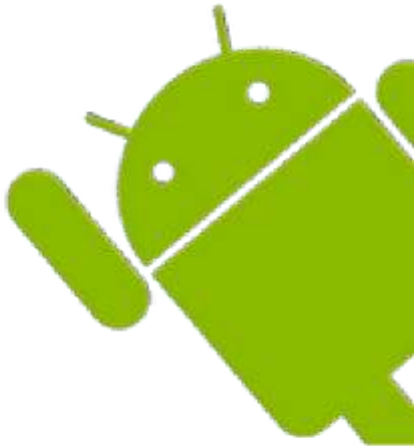


http://pro.jsonlint.com/

Second Mandatory Assignment

You decide on the user interface and functionality !!

Possible Tingle extensions



Crowdsourcing of registrations
    separating private and public things?

Efficient handling of images
    searching images?

Ordering search results

Synchronisation with server database(s)

Using location (indoor tracking)

…