Mobile Application Development
Google Maps Android API

Waterford Institute of Technology
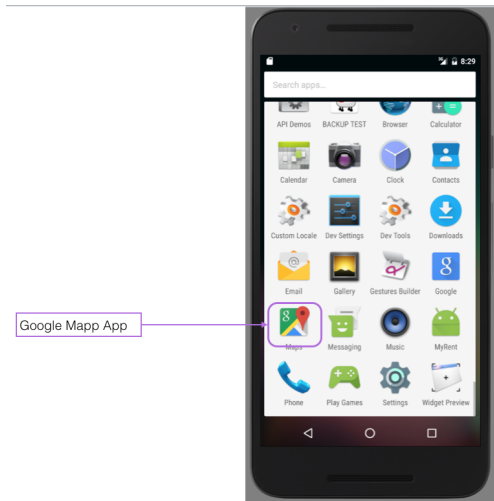
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Google Maps Android API
Overview

- Enable launching of external Google Maps app
- Switch to embedding Google map
- Map API becomes accessible
- Begin with sample code (referenced below)
- Build on this, adding features
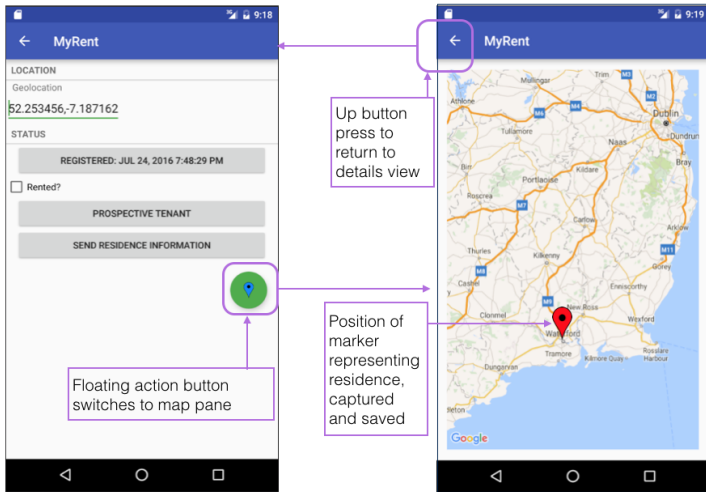- Option to launch map associated with particular residence

Google Map

Use the Google Maps application

Google Mapp App

Google Map

Embed in MapActivity & access API

Up button press to return to details view

Floating action button switches to map pane

Position of marker representing residence, captured and saved

Google Maps Android API
API features

Google Maps Android API

- Embed & display map
- Access Google Map servers
- Download map data
- Add markers, polygons, overlays
- Change zoom level
- Determine geolocation
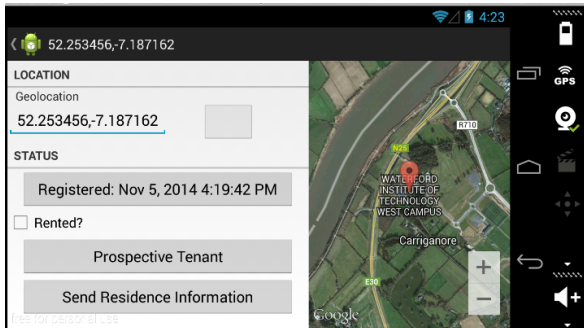- Select map type such as normal or hybrid

Google Maps Android API

Preparatory work

Google Play Services

- Install via Android SDK Manager
- Import to MyRent workspace
- Reference in manifest file
- Reference in MyRent properties

Google Maps Android API
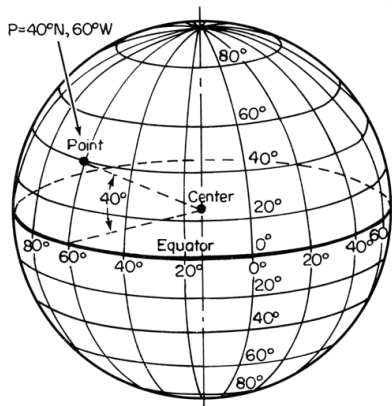Maps API key

Generating & using key

- Each app requires key
- Key obtainable at Google API console
- Must be registered user
- Generate key
- Add key to gradle
- Reference key in manifest
- Switch on API in console

Google Maps Android API
Geolocation

LatLng stores map data

- Units are degrees
- Ranges:
    - Longitude: 0 to +/- 180
    - Latitude: 0 to +/- 90
- One degree (metres)
    - latitude approx 111
    - longitude same at equator
    - zero at poles
- Accuracy decimal places:
    - Four: 11 m (Garmin 15 m)
    - Six: 11 cm
    - Seven: 11 mm

Google Maps Android API

Helpers

Data input and manipulation

- Geolocation data input as String
- Necessary convert to & from Android **LatLng**

```java
public static LatLng latLng(Context context, String geolocation)
{
 String[] g = geolocation.split(",");
 return new LatLng(Double.parseDouble(g[0]), Double.parseDouble(g[1]));
}
```
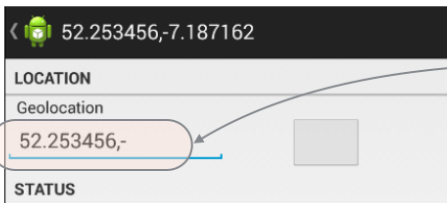
```java
public static String latLng(LatLng geo)
{
 return String.format("%.6f", geo.latitude) + ", "
     + String.format("%.6f", % geo.longitude);
}
```

Geolocation

Validation

Geolodation data input

- Validation introduced in MapHelper.latlng
- Disallows invalid geolocation
- try-catch block used

Example invalid data input

Google Maps Android API
API Key - Manifest

```
<application ...>
  ...
  <!--Google MAP API key placeholder -->
  <!--Keys in build.gradle (app) -->
  <meta-data
    android:name="com.google.android.maps.v2.API_KEY"
    android:value="${google_map_key}"/>

</application>
```
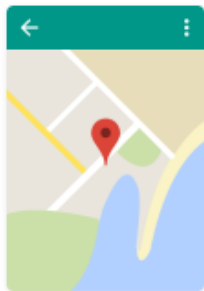
Google Maps Android API

API Key - Gradle

```
buildTypes {
 release {
  minifyEnabled false
  proguardFiles getDefaultProguardFile('proguard−android.txt'
  ), 'proguard−rules.pro'
  manifestPlaceholders = [google_map_key: "AIzaxxxxxxx"]
 }
 debug {
  manifestPlaceholders = [google_map_key: "AIzaxxxxxxx"]
  debuggable true
 }
}
```

Google Maps Android API
SHA-1 Fingerprint required to obtain key

How to obtain fingerprint

- Unique for each computer
- Create an Android project
- Use wizard Google Maps Activity
- Fingerprint in file google_maps_api.xml
- Detailed instructions lab Appendix

Google Maps Activity

Google Maps Android API

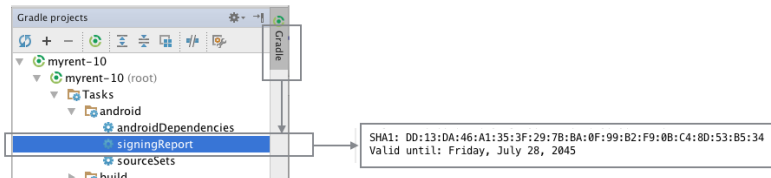SHA-1 Fingerprint required to obtain key

Obtain fingerprint for each development machine

org.wit.myrent	DD:13:DA:46:A1:35:3F: :8D:53:B5:34
org.wit.myrent	59:4E:E8:6F:3F:0C:B8:5 AA:39:A9:D4

Google Maps Android API

SHA-1 Fingerprint required to obtain key

Obtain fingerprint from within Android Studio

References

Google Maps

1. Android Maps API: Getting Started

https://developers.google.com/maps/documentation/
android-api/start [Accessed 2016-10-11]

2. Google Maps API Key

https://developers.google.com/maps/documentation/
android-api/signup

[Accessed 2016-10-13]

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