# FUNDAÇÃO INSTITUTO DE EDUCAÇÃO DE BARUERI

Instituto Técnico de Barueri "Brasílio Flores de Azevedo"

**Tecnologias Emergentes** 

Tutorial Geolocalização Mapa versão 1.0

Prof. Adriano Domingues

2019

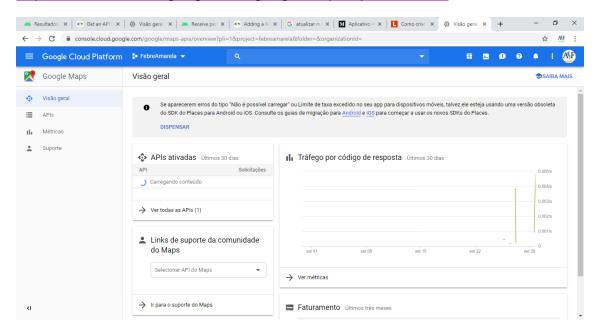
# AULA 18 - Geolocalização Carregando Mapa

Vamos continuar no projeto Aula16Geo:

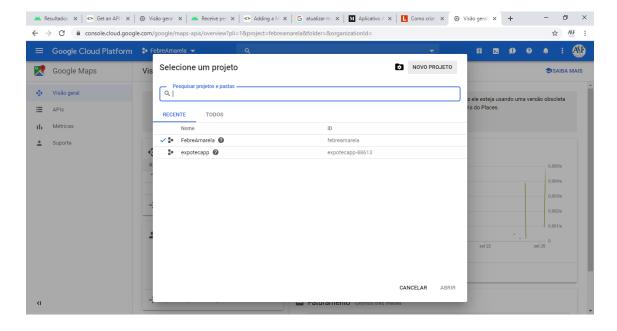
Para realizar este projeto você irá precisar da API key (chave de API), exigência da Google para que possamos utilizar o serviço de localização em um mapa.

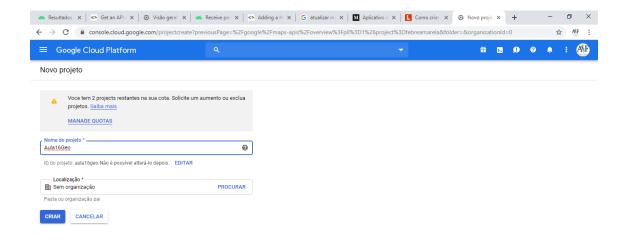
# Com uma conta Google entre no site

https://console.cloud.google.com/google/maps-apis/overview



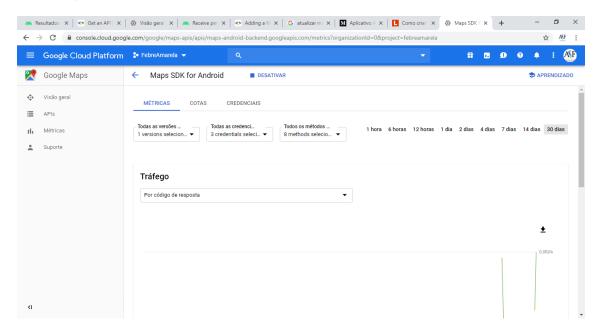
Crie um novo projeto, no nosso caso o projeto se chama Aula16Geo:



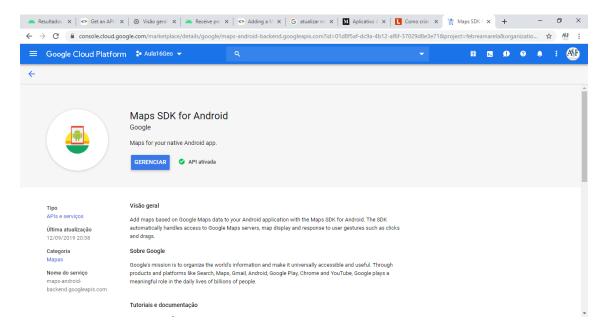


Crie o projeto para possibilitar o vínculo de uma chave de API.

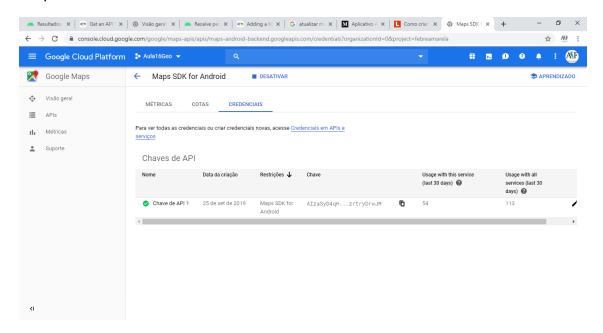
Em seguida clique em APIs e ative o *Maps SDK for Android*, realize a ativação do serviço.



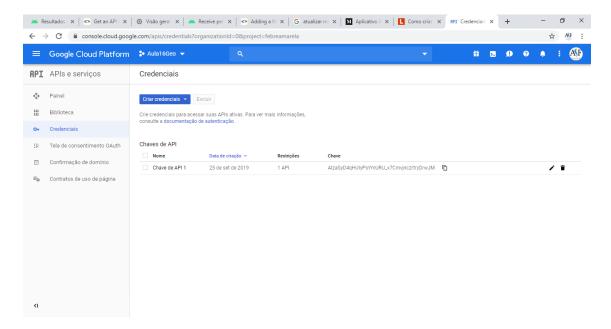
Selecione o projeto criado Aula16Geo e clique no serviço Maps SDK for Android:



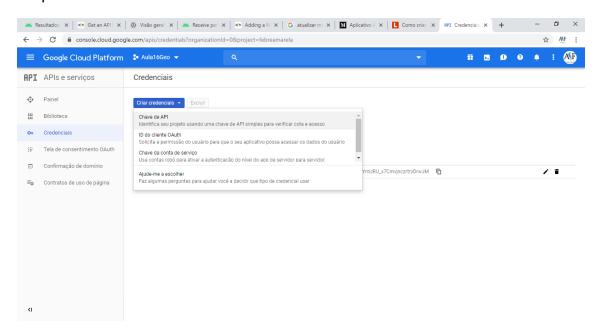
# Clique no botão Gerenciar:



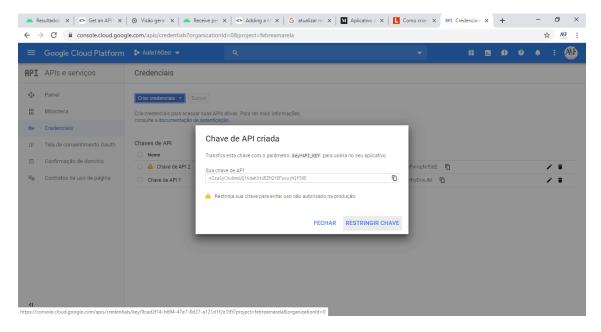
Em seguida clique no link Credenciais em APIs e serviços:



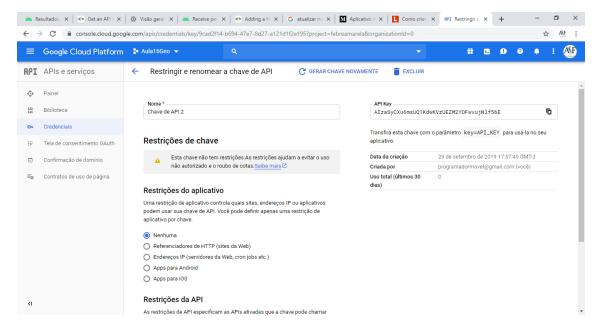
# Cliquem em Criar credenciais > Chave de API



A chave será gerada:



# Clique em Restringir Chave:



Configure as restrições:

Restrições de aplicativo > Apps para Android

Restringir o uso de apps para Android:

Precisamos preencher:

Nome do pacote

Impressão digital para certificação SHA-1

Este impressão digital é obtida executando o comando:

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Prof. Adriano Domingues

keytool -list -v -keystore "%USERPROFILE%\.android\debug.keystore" -alias androiddebugkey -storepass android -keypass android

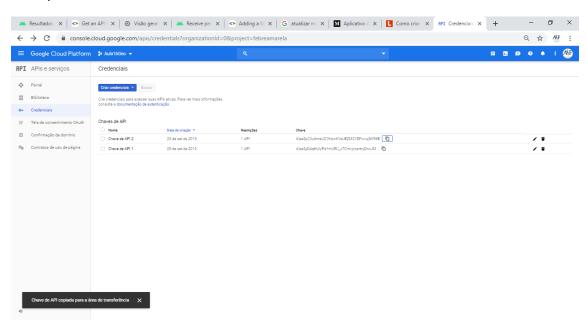
Abra o Prompt de Comando (cmd) e procure o executável keytool:

No meu caso o keytool esta na pasta C:\Program Files\Android\Android Studio\jre\bin>

Copie a chave SHA1 gerada e copie no campo exigido para restrição, e clique em Concluir.

Restrições de API > Restringir Chave > Maps SDK for Android

E clique em Salvar.



Copie a chave que será adicionada no Android Manifest.

Abra o arquivo AndroidManifest.xml em Android > app > manifests

```
- 6 ×
Aula 16Geo [C:\DOMTEC\ITB\2019\TEEM\Tutoriais\Aula 16Geo] - ...\app\src\main\AndroidManifest.xml [app] - Android Studio
<u>File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help</u>

≜ Aula16Geo >  app >  src >  main >  AndroidManifest.xml >  AndroidManifest.xml >  

■ AndroidMan
                                                                                                                                                                                                                                      □ → app ∨ ▶ 4 # ⊙ ∧ # ■ | № □ • Q = AF
      📦 MainActivity.java × 🔌 app × 🔊 Aula16Geo × 🚆 activity_main.xml × 📫 AndroidManifest.xml ×
                                                                                                                                                                                                                                                                          Try Again Open 'Build' View Show Log in Explorer
      Gradle project sync failed. Basic functionality (e.g. editing, debugging) will not work properly.
                             <?xml version="1.0" encoding="utf-8"?>
                           <manifest xmlns:android="http://schemas.android.com/apk/res/android"</pre>
                                       package="br.com.domtecpro.aula16geo">
                                          <uses-permission android:name="android.permission.INTERNET"/>
                          <uses-permission android:name="android.permission.ACCESS_COARSE_LOCATION"/>
                                         <uses-permission android:name="android.permission.ACCESS_FINE_LOCATION"/>
                                         <application
                                              android:allowBackup="true"
 § 11
                                                      android:icon="@mipmap/ic_launcher"
                                                android:label="Aula16Geo"
                                              android:roundIcon="@mipmap/ic_launcher_round"
android:supportsRtl="true"
                                                android:theme="@style/Platform.MaterialComponents.Light">
<activity android:name=".MainActivity">
 15
16
B 17
                                                                <intent-filter>
                       manifest > uses-permission
          Text Merged Manifest
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I TODO Build E & Logat I Terminal
```

# Abaixo da linha 15, antes da tag <activity> adicione:

```
<meta-data
    android:name="com.google.android.geo.API_KEY"
    android:value="YOUR API KEY"/>
```

#### No caso deste tutorial

```
🚣 Aula16Geo 🗦 🐯 app > 🐯 src > 🖿 main > 🦣 AndroidManifest.xml >
                                                                                            MainActivity.java × 🔊 app × 🔊 Aula16Geo × 🚆 activity_main.xml × 🖷 AndroidManifest.xml ×
                                                                                                                  Try Again Open 'Build' View Show Log in Explorer
  Gradle project sync failed. Basic functionality (e.g. editing, debugging) will not work properly
             android:allowBackup="true"
10
ž 11
                    android:icon="@mipmap/ic_launcher"
                  android: label="Aula16Geo"
                    android:roundIcon="@mipmap/ic_launcher_round"
  14
                    android:supportsRtl="true"
15
15
                    android: theme="@style/Platform.MaterialComponents.Light">
₹ 16
17
                  <meta-data
                         android:name="com.google.android.geo.API_KEY"
19
                           android:value="AIzaSyCXu6msUQ1KdwKVzUEZM2YDFwvujNlf56E"/>
10 move 21
                     <activity android:name=".MainActivity">
E 22
                         <intent-filter>
23 Aguiants
                                <action android:name="android.intent.action.MAIN" />
₹ 25
                             <category android:name="android.intent.category.LAUNCHER" />
          manifest > application
   Text Merged Manifest
App is not indexable by Google Search; consider adding at least one Activity with an ACTION-VIEW intent filter. See issue explanation for more details, more... (Ctrl+F1)
App is not indexable by Google Search; consider adding at least one Activity with an ACTION-VIEW intent filter. See issue explanation for more details.
                                                                                                                Atom One Light 
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1 
20:9
```

Na linha 21 em diante adicione esta meta-data que solicita o carregamento do Google Play Services no aparelho, de acordo com a versão compilada no projeto:

#### <meta-data android: name="com.google.android.gms.version" android:value="@integer/google\_play\_services\_version" /> <u>File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help</u> □ > ■ APP ∨ ▶ ½ ♦ ⊙ Ø ♥ ■ Ø Q ■ Q ■ AF ∮ Aula16Geo > app > src > main > AndroidManifest.xml > AndroidManifest.xml > 🧕 📦 MainActivity.java 🗴 🧳 app 🗴 🥻 Aula16Geo 🗴 🚆 activity\_main.xml 🗴 🌼 AndroidManifest.xml 🗴 Try Again Open 'Build' View Show Log in Explorer android:roundIcon="@mipmap/ic\_launcher\_round" android:supportsRtl="true android: theme="@style/Platform.MaterialComponents.Light"> <meta-data 16 android:name="com.google.android.geo.API\_KEY" android:value="AIzaSyCXu6msUQ1KdwKVzUEZM2YDFwvujNlf56E"/> cometa-data android:name="com.google.android.gms.version" android:value="@integer/google\_play\_services\_version" /> android:value="@integer/google\_play\_services\_version" /> cativity android:name=".MainActivity"> cintent-filter> cation android:name="android.intent.action.MAIN" /> cation android:name="android.intent.action.MAIN" /> 19 ਤੂੰ 20 = 21 23 27 ₹ 29 <category android:name="android.intent.category.LAUNCHER" /> manifest > application | Lext | Mergea mannerst | App is not indeable by Google Search; consider adding at least one Activity with an ACTION-VIEW intent filter. See issue explanation for more details, more... (Ctrl+F1) C Event Log App is not indexable by Google Search; consider adding at least one Activity with an ACTION-VIEW intent filter. See issue explanation for more details. Atom One Light 24:1 CRLF UTF-8 4 spaces 0 1 @

#### Adicione as permissões:

```
<uses-permission
    android:name="android.permission.WRITE_EXTERNAL_STORAGE" />
<uses-permission
android:name="android.permission.READ_EXTERNAL_STORAGE" />
<uses-permission
android:name="android.permission.ACCESS_NETWORK_STATE" />
```

Insira a declaração abaixo para tornar explícita a necessidade de utilização do OpenGL ES versão 2 para renderizar o mapa, se o aparelho não possuir este recurso o app não irá rodar adequadamente:

```
<uses-feature
    android:glEsVersion="0x00020000"
    android:required="true"/>
```

Ainda no Android Manifest adicione para definir a utilização da biblioteca Apache HTTP Legacy:

```
<uses-library
    android:name="org.apache.http.legacy"
    android:required="false" />
```

```
- 6 ×
 Aula 16Geo [C:\DOMTEC\ITB\2019\TEEM\Tutoriais\Aula 16Geo] - ...\app\src\main\AndroidManifest.xml [app] - Android Studio
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♠ MainActivity.java × 

♠ Aula16Geo × 

☐ activity_main.xml × 

♠ AndroidManifest.xml × 

♠ app ×

                   android: Lapel="AulaibGeo"
 21
                   android:roundIcon="@mipmap/ic_launcher_round"
 22
23
                    android:supportsRtl="true"
                   android:theme="@style/Platform.MaterialComponents.Light">
   24
                    <meta-data
26
27
28
                         android:name="com.google.android.geo.API_KEY"
                          android:value="AIzaSyCXu6msUQ1KdwKVzUEZM2YDFwvujNlf56E"/>
 29
                    <meta-data
                         android:name="com.google.android.gms.version"
 31
32
                         android:value="@integer/google_play_services_version" />
                   <uses-library
 33
33
                     android:name="org.apache.http.legacy"
 ig 34
                         android:required="false" />
 Variants 96
                     <activity android:name=".MainActivity">
          manifest > application
     Text Merged Manifest
 Text Mergeu Month S. & Logcat Terminal
 Executing tasks: [:app:assembleDebug] (a minute ago)
                                                                                           C 2 processes running... Atom One Light ● 32:1 CRLF ○ UTF-8 4 spaces ○ 🚡 🙊
```

# Copie os arquivos na pasta lib do projeto:

- maps-sdk-3.0.0-beta.aar
- places-maps-sdk-3.0.0-beta.aar

# Altere o arquivo build.gradle (Project: Aula16Geo)

```
repositories {
      google()
       jcenter()
       flatDir {
             dirs 'libs'
Aula16Geo IC:\DOMTEC\ITB\2019\TEEM\Tutoriais\Aula16Geo1 - Aula16Geo - Android Studio
                                                                                                                       - a ×
<u>File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help</u>
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                           Gradle project sync failed. Basic functionality (e.g. editing, debugging) will not work properly.
  > 📭 app
                                          // NOTE: Do not place your application dependencies here; they belong
a build.gradle (Project: Aula16Geo) 14
                                           // in the individual module build.gradle files
    }
                                 ()
                                  allprojects {
                                    repositories {
    settings.gradle (Project Settings)
    (1) local.properties (SDK Location)
                                        google()
                                            jcenter()
                                            flatDir {
                                                dirs 'libs'
                                           }
                                       }
                                  }
                                   task clean(type: Delete) {
                                     delete rootProject.buildDir
  ■ TODO ■ Build ■ 6: Logcat ■ Terminal

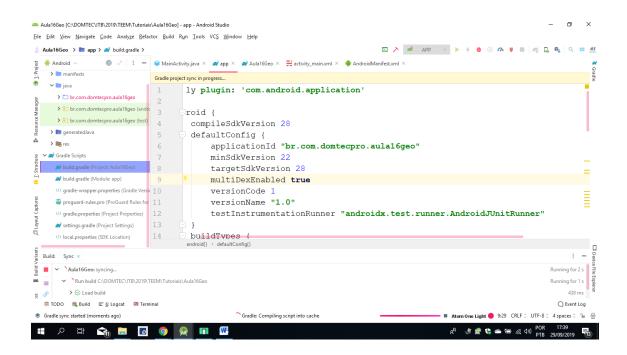
    Gradle sync failed (13 s 113 ms) (55 minutes ago)
```

# Adicione a dependência abaixo no build.gradle (Module: app):

```
implementation 'com.google.android.gms:play-services-maps:17.0.0'
implementation name:'maps-sdk-3.0.0-beta', ext:'aar'
implementation 'com.android.support:support-v4:+'
implementation 'com.android.support:appcompat-v7:+'
implementation 'com.google.android.gms:play-services-basement:15.0.1'
implementation 'com.google.android.gms:play-services-base:15.0.1'
implementation 'com.google.android.gms:play-services-gcm:15.0.1'
implementation 'com.google.android.gms:play-services-location:15.0.1'
implementation 'com.google.android.gms:play-services-location:15.0.1'
implementation 'com.google.maps.android:android-maps-utils-sdk-v3-compat:0.1'
```

## Ainda neste mesmo arquivo adicione o comando na linha 9:

multiDexEnabled true



Nosso Android Manifest ficará assim:

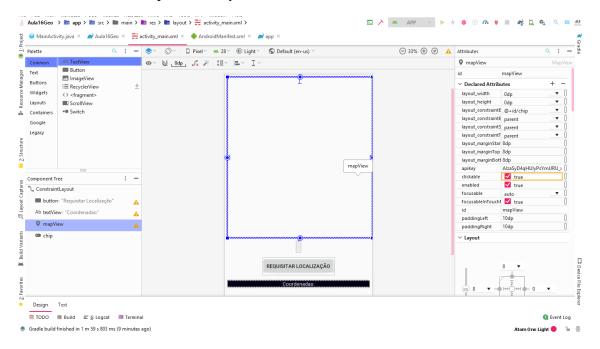
```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"</pre>
    package="br.com.domtecpro.aula16geo">
    <uses-permission android:name="android.permission.INTERNET"/>
    <uses-permission</pre>
android:name="android.permission.ACCESS COARSE LOCATION"/>
    <uses-permission</pre>
android:name="android.permission.ACCESS FINE LOCATION"/>
    <uses-permission</pre>
        android:name="android.permission.WRITE EXTERNAL STORAGE" />
    <uses-permission</pre>
android:name="android.permission.READ EXTERNAL STORAGE" />
    <uses-permission</pre>
android:name="android.permission.ACCESS_NETWORK_STATE" />
    <uses-feature
        android:glEsVersion="0x00020000"
        android:required="true"/>
    <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/Platform.MaterialComponents.Light">
            android:name="com.google.android.geo.API KEY"
            android:value="AIzaSyCXu6msUQ1KdwKVzUEZM2YDFwvujNlf56E"/>
            android: name="com.google.android.gms.version"
            android:value="@integer/google play services version" />
        <uses-library</pre>
            android:name="org.apache.http.legacy"
            android:required="false" />
        <activity android:name=".MainActivity">
            <intent-filter>
                 <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER"</pre>
/>
            </intent-filter>
        </activity>
    </application>
```

Sincronize o projeto e aguarde o download das bibliotecas no projeto.

Adicione o objeto do tipo MapView no layout do projeto (activity\_main.xml):

```
<com.google.android.libraries.maps.MapView</pre>
    android:id="@+id/mapView"
    android:layout width="0dp"
    android:layout_height="0dp"
    android:layout_marginStart="8dp"
    android:layout_marginTop="8dp"
    android:layout marginBottom="8dp"
    android:apiKey="AIzaSyD4qHUIyPsYmURU x7CmvjnczrtryDrwJM"
    android:clickable="true"
    android:enabled="true"
    android: focusable="auto"
    android:focusableInTouchMode="true"
    android:paddingLeft="10dp"
    android:paddingRight="10dp"
    app:layout constraintBottom toTopOf="@+id/chip"
    app:layout_constraintEnd toEndOf="parent"
    app:layout constraintStart toStartOf="parent"
    app:layout constraintTop toTopOf="parent" />
```

# Efetuando as alterações do layout temos:



# Na linha 45 faça as declarações dos objetos abaixo:

```
MapView mapView;
Bundle mapViewBundle;
private GoogleMap gmap;
private static final String MAP_VIEW_BUNDLE_KEY =
"AlzaSyD4qHUIyPsYmURU_x7CmvjnczrtryDrwJM";
```

Na linha 52 insira o código para definir as coordenadas que serão apontadas no mapa:

```
// posição geográfica da cidade de Nova York
double latitude = 40.7143528, longitude = -74.0059731;
```

Vamos inserir a criação do mapa na linha 62:

```
mapView = findViewById(R.id.mapView);
```

E logo abaixo o pacote que armazena o credenciamento do mapa para acesso ao serviço do Google Maps:

```
mapViewBundle = null;
if (savedInstanceState != null) {
    mapViewBundle = savedInstanceState.getBundle(MAP_VIEW_BUNDLE_KEY);
}
```

A partir da linha 139, ainda dentro do método onCreate() insira a chamada do método de carregamento do mapa:

```
// Carrega o mapa com as coordenadas (latitude e longitude)
carregaMapa (mapViewBundle);
```

Na linha 144 vamos inserir o método de carregamento do mapa:

```
public void carregaMapa(Bundle mapViewBundle) {
    mapView.setClickable(true);
    mapView.onCreate(mapViewBundle);
    mapView.getMapAsync(this);
}
```

Para que o mapa carregue as coordenadas da localização atual, devemos inserir a atualização da latitude e longitude no método onLocationChanged() do locationListener:

```
latitude = location.getLatitude();
longitude = location.getLongitude();
```

```
- 6 ×
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<u>File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help</u>
🙏 Aula16Geo > 🛅 app > 🛅 gg > 🛅 main > 🗎 java > 🗈 br > 🗈 gom > 🗈 gom > 🗈 domtecpro > 🖸 aula16geo > 📦 MainActivity >
  locationManager = (LocationManager) getSystemService(LOCATION_SERVICE);
  92
                   locationListener = new LocationListener() {
                      @Override
  95 🎊
                       public void onLocationChanged(Location location) {
                            textView.append("\n " + location.getLatitude() + " " + location.getLatitude());
  98
                            latitude = location.getLatitude();
                    longitude = location.getLongitude();
  103 ₺
                       public void onStatusChanged(String provider, int status, Bundle extras) {
sugar 104
106
          MainActivity > onCreate() > new LocationListener > onLocationChanged()
Gradle build finished in 1 m 59 s 803 ms (27 minutes ago)
```

E na chamada do botão de requisição vamos adicionar o carregamento do mapa:

Por fim, precisamos adicionar a implementação do OnMapReadyCallBack na assinatura da classe MainActivity:

```
public class MainActivity extends AppCompatActivity implements
OnMapReadyCallback {
```

E quando a linha ficar vermelha clique na lâmpada e selecione a opção **Implement Method:** 



Clique em OK

```
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👅 Aula16Geo [C:\DOMTEC\ITB\2019\TEEM\Tutoriais\Aula16Geo] - ...\app\src\main\java\br\com\domtecpro\aula16geo\MainActivity.java [app] - Android Studio
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  MainActivity.java × 

  Aula16Geo × 

  activity_main.xml × 

  AndroidManifest.xml × 
  app ×

                    private void negarPermissao() { locationManager.removeUpdates(locationListener); }
234
                    @Override
 236
                    public void onMapReady(GoogleMap googleMap) {
239
240
             MainActivity > onMapReady()
Build: Build Output × Sync ×
        ✓ (X) Java compiler: (1 error)
                                                                                             error: incompatible types: MainActivity cannot be
          ✓ In C:/DOMTEC/ITB/2019/TEEM/Tutoriais/Aula16Geo (1 error)
             ✓ ■ app/src/main/java (1 error)
                                                                                                                                  Atom One Light 
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4 spaces 
4 Spaces
```

# E altere o método onMapReady() como abaixo:

Teste a aplicação e verifique se o mapa é carregado.

Adicione o ciclo de vida da atividade para controlar explicitamente o ciclo de vida do mapa:

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```
@Override
protected void onStart() {
   super.onStart();
    mapView.onStart();
}
@Override
protected void onStop() {
    super.onStop();
    mapView.onStop();
@Override
protected void onPause() {
    mapView.onPause();
    super.onPause();
@Override
protected void onDestroy() {
    mapView.onDestroy();
    super.onDestroy();
}
@Override
public void onLowMemory() {
    super.onLowMemory();
    mapView.onLowMemory();
}
```

# Referência Bibliográfica

- [1] http://developer.android.com. Acessado em 28/04/2019.
- [2] <a href="https://www.youtube.com/watch?v=QNb\_3QKSmMk">https://www.youtube.com/watch?v=QNb\_3QKSmMk</a>. Acessado em 19/09/2019.
- [3] <a href="https://imasters.com.br/android/requisitando-localizacao-usuario-da-forma-correta-no-android">https://imasters.com.br/android/requisitando-localizacao-usuario-da-forma-correta-no-android</a>. Acessado em 20/09/2019.
- [4] <a href="https://developers.google.com/maps/documentation/android-sdk/v3-client-migration">https://developers.google.com/maps/documentation/android-sdk/v3-client-migration</a>. Acessado em 29/09/2019.
- [5] <a href="https://developers.google.com/maps/documentation/android-sdk/map-with-marker">https://developers.google.com/maps/documentation/android-sdk/map-with-marker</a>. Acessado em 29/09/2019.
- [6] <a href="https://www.luiztools.com.br/post/como-criar-um-aplicativo-android-com-aps/">https://www.luiztools.com.br/post/como-criar-um-aplicativo-android-com-aps/</a>. Acessado em 29/09/2019.
- [7] https://www.zoftino.com/android-mapview-tutorial. Acessado em 29/09/2019.
- [8] <a href="https://developers.google.com/maps/documentation/android-sdk/current-place-tutorial">https://developers.google.com/maps/documentation/android-sdk/current-place-tutorial</a>. Acessado em 29/09/2019.