PERTEMUAN 8:
GOOGLE MAP

A. TUJUAN PEMBELAJARAN

Adapun tujuan pembelajaran yang akan dicapai sebagai berikut:

8.1 Mengenal Mapview

8.2 Membuat Project Dengan Google Maps

8.3 Membuat Aplikasi GPS

B. URAIAN MATERI

Tujuan Pembelajaran 8.1:
Mengenal Mapview

Untuk menampilkan Google Map, dapat digunakan dua cara, yaitu dengan MapView (Android Maps API), atau WebView. Memakai MapView lebih disarankan karena tidak perlu repot-repot dua kali coding ketika ingin membuatnya, namun kekurangannya adalah MapView bukanlah paket yang otomatis ter-include di dalam Android SDK, sehingga harus download package tambahan yang bernama GoogleAPIs. Untuk dapat menampilkan maps memakai MapView harus mempunyai MapsAPIKey yang dapat di-download di website Android Maps API(https://developers.google.com/maps/documentation/android/v1/maps-api-signup).

Berikut ini adalah langkah-langkah untuk mendapatkan Maps API Key:

a. Langkah pertama, harus mendapatkan Android certificate MD5 fingerprint dari debug keystore yang biasanya terdapat di:

   Windows Vista/7: C:\Users\<user>\.android\debug.keystore

   Windows XP: C:\Documents and Settings\<user>\.android\debug.keystore

   Linux: ~/.android/debug.keystore

   Harus memiliki file keytool.exe, yang termasuk bagian dari JRE (Java Runtime Envirenment), terdapat di dalam folder java/jre<versi>/bin.

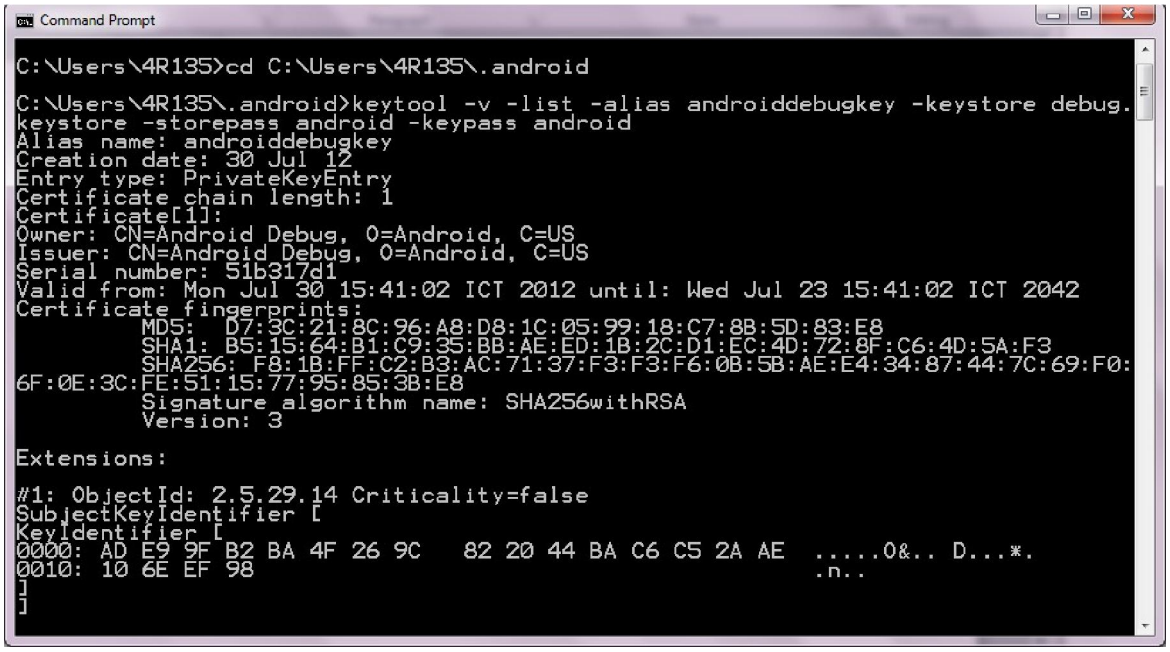
   Masuk ke folder keystore sesuai OS (Operating System) yang digunakan.

   ```
   CD C:\Users\<user>\.android\debug.keystore
   ```

   Ketik perintah:

```
keytool -v -list -alias androiddebugkey -keystore debug.keystore -storepass android -keypass android
```

Maka akan ditampilkan certificate fingerprints dengan format MD5.



Gambar 8. 1 Men-generate certificate fingerprints

b. Langkah berikutnya adalah men-generateAPI Key, yaitu dengan cara membuka website Google Maps Android v1 API Key Signup (https://developers.google.com/maps/documentation/android/v1/maps-apisignup). Copy certificate fingerprints yang dihasilkan oleh keytool dan paste ke dalam textbox, selanjutnya klik tombol generate API Key.

Gambar 8. 2 Men-generate API Key

Maka akan ditampilkan Google Maps API Key:

Your key is:

```
0Ba1o3C-9FEqskBBnno33qmdUebQGjVt12dvUQA
```

This key is good for all apps signed with your certificate whose fingerprint is:

```
D7:3C:21:8C:96:A8:D8:1C:05:99:18:C7:8B:5D:83:E8
```

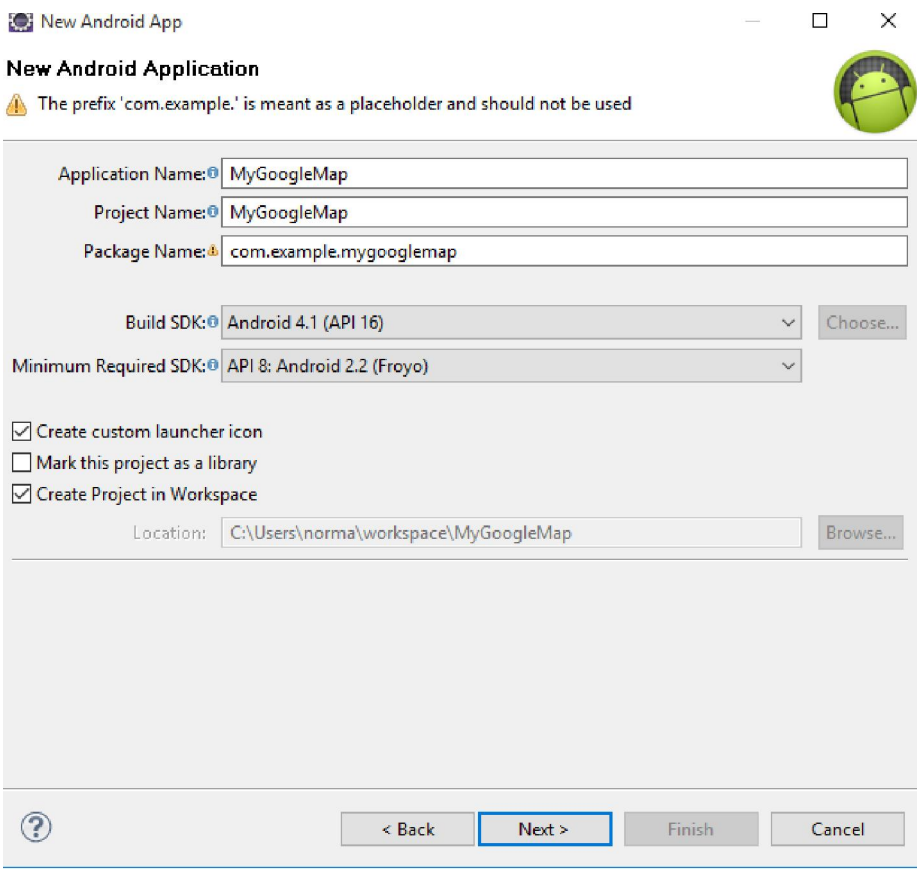
Here is an example xml layout to get you started on your way to mapping glory:

```
<com.google.android.maps.MapView
   android:layout_width="fill_parent"
   android:layout_height="fill_parent"
   android:apiKey="0Ba1o3C-9FEqskBBnno33qmdUebQGjVt12dvUQA"
   />
```

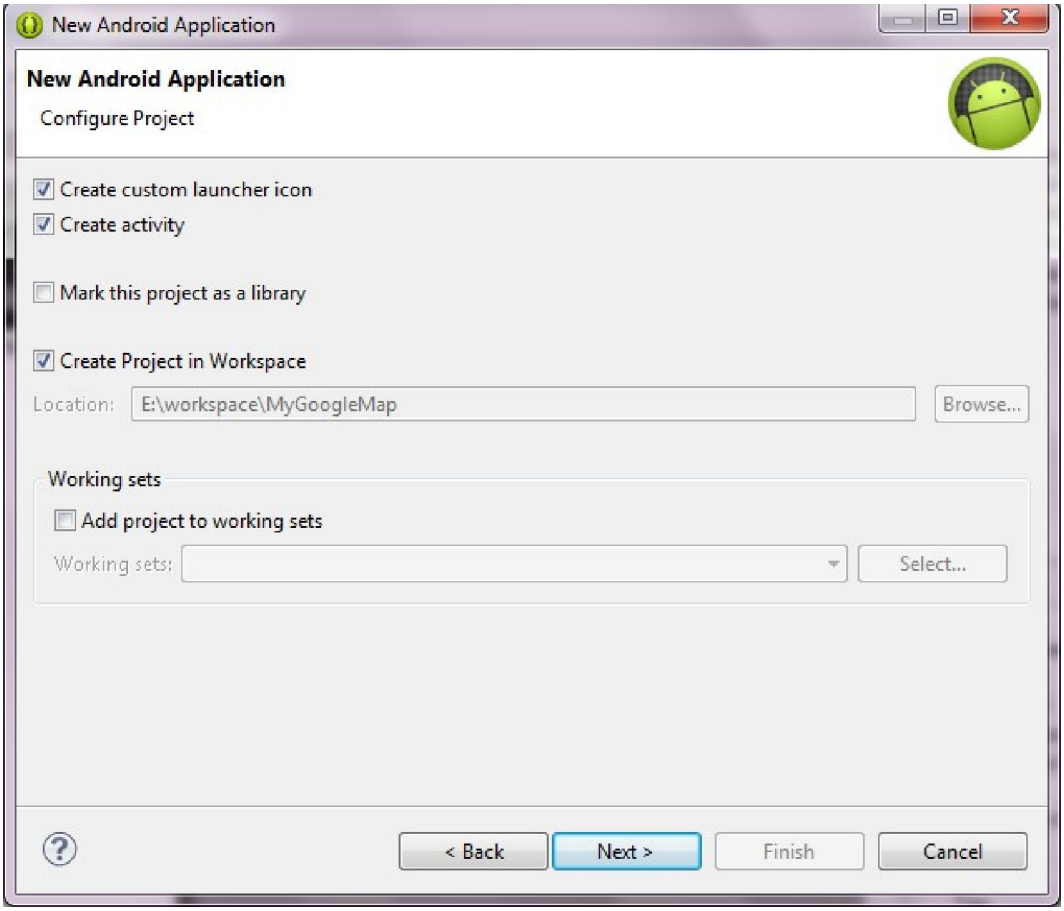
Gambar 8. 3 Google APIs Key

Tujuan Pembelajaran 8.2:

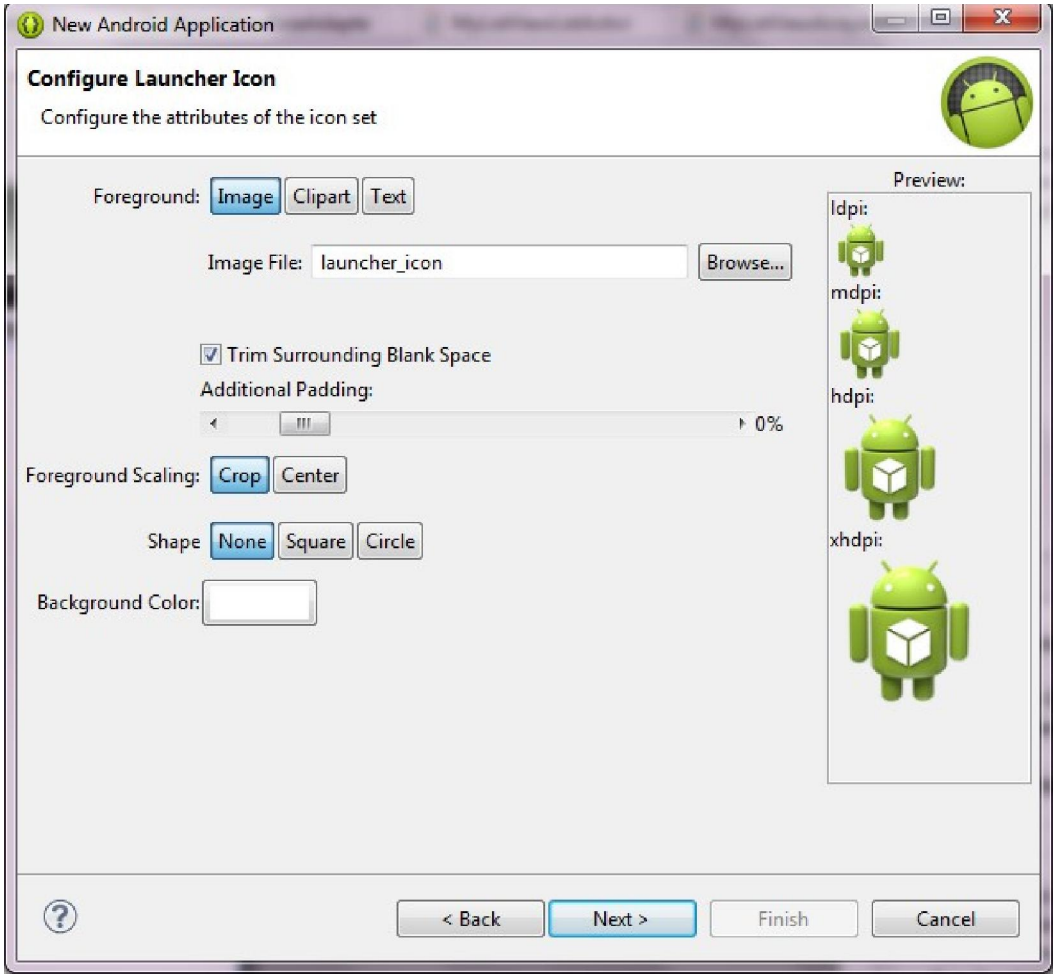
Membuat Project Dengan Google Map



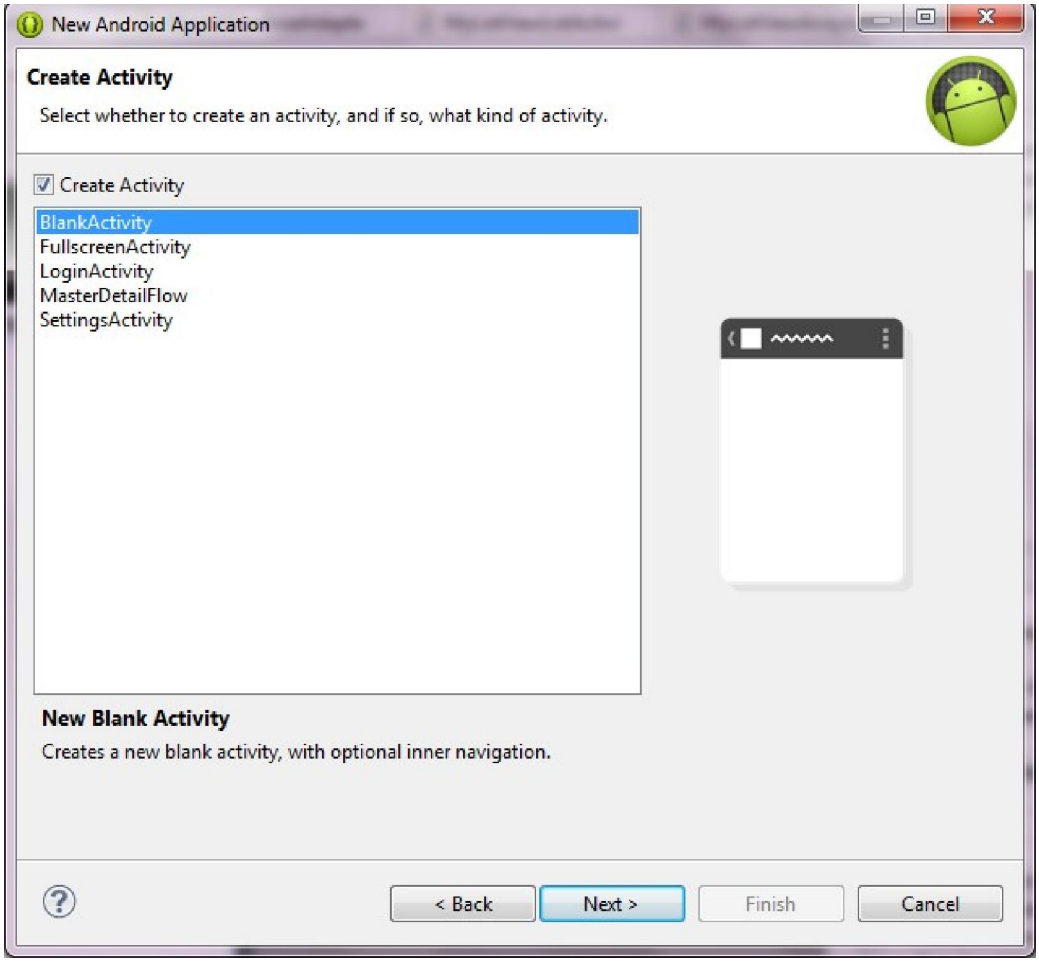
Gambar 8. 4 Kotak dialog Penamaan Project



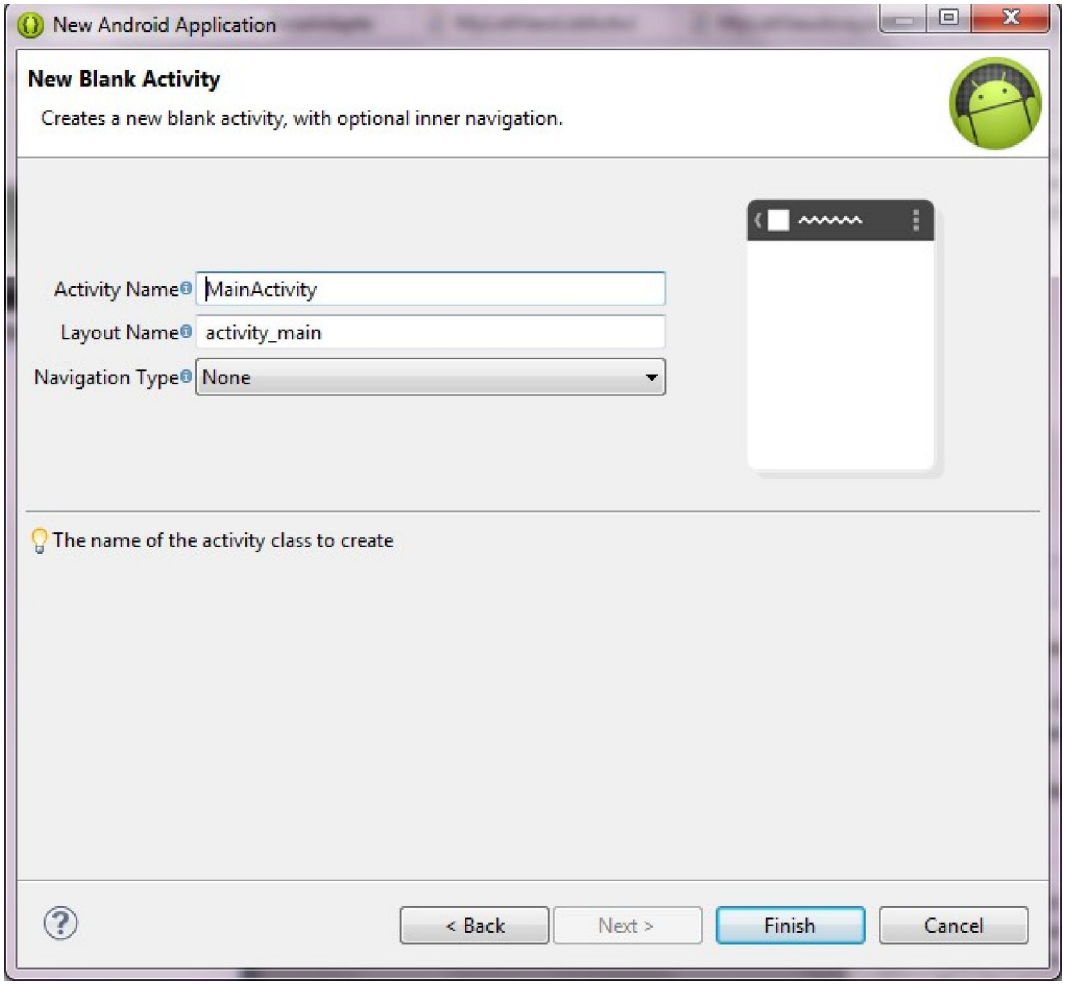
Gambar 8. 5 Kotak dialog penentuan lokasi project



Gambar 8. 6 Kotak dialog konfigurasi launcher icon

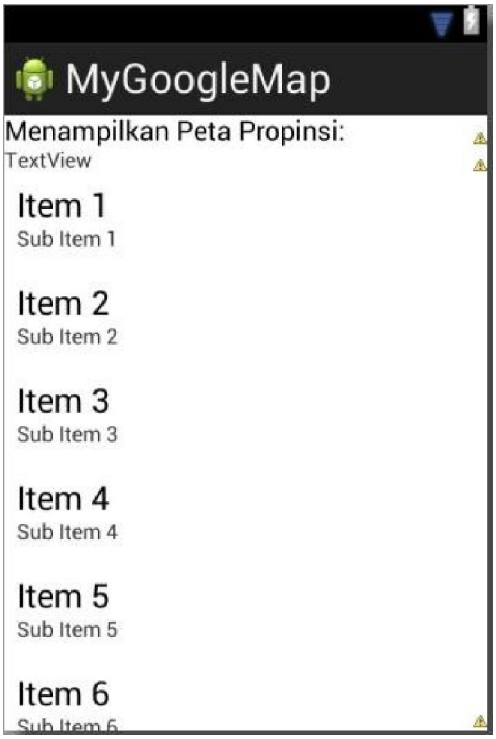


Gambar 8. 7 Kotak dialog Pilih Jenis Activity

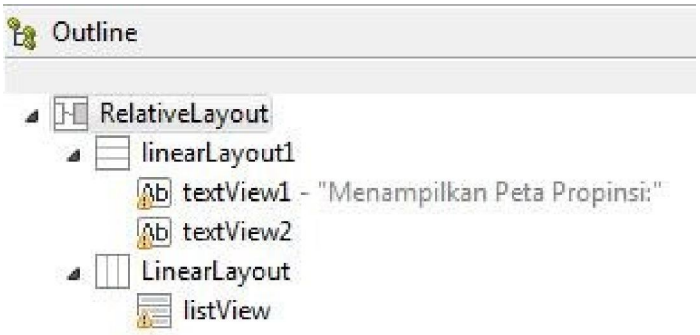


Gambar 8. 8 Kotak dialog
penamaan activity

Selanjutnya buatlah desain seperti gambar di bawah ini:

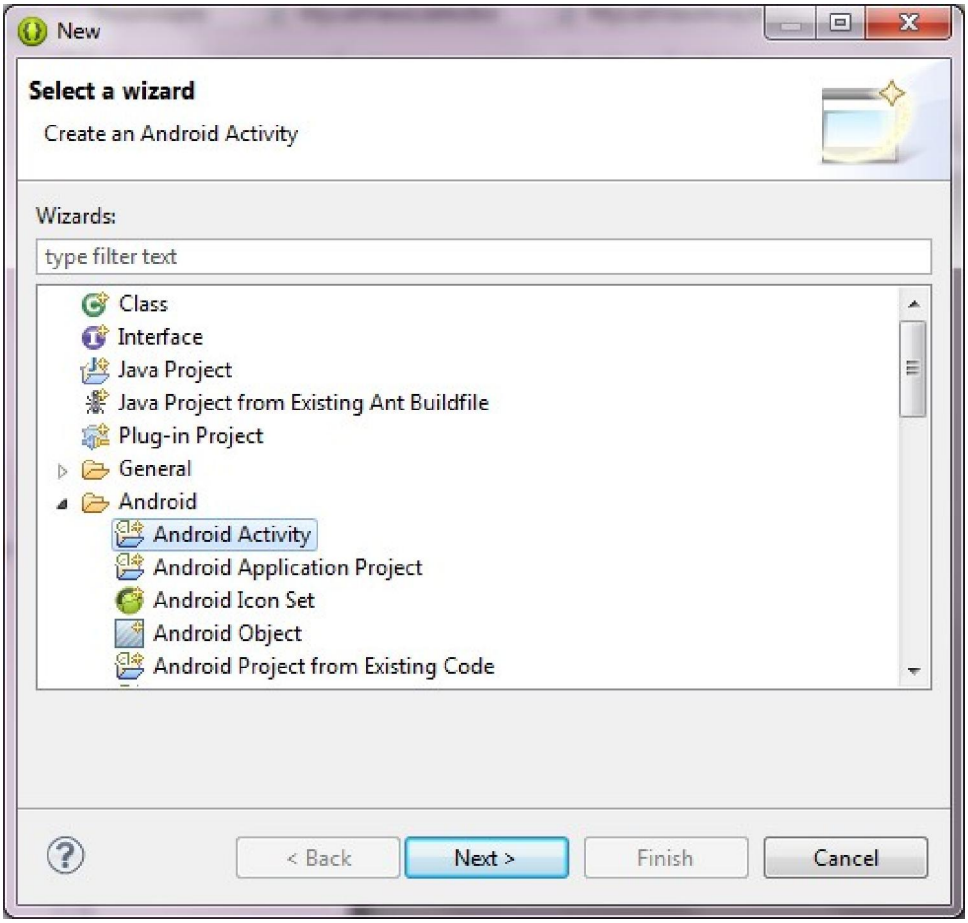


Gambar 8. 9 Desain layout activity_main

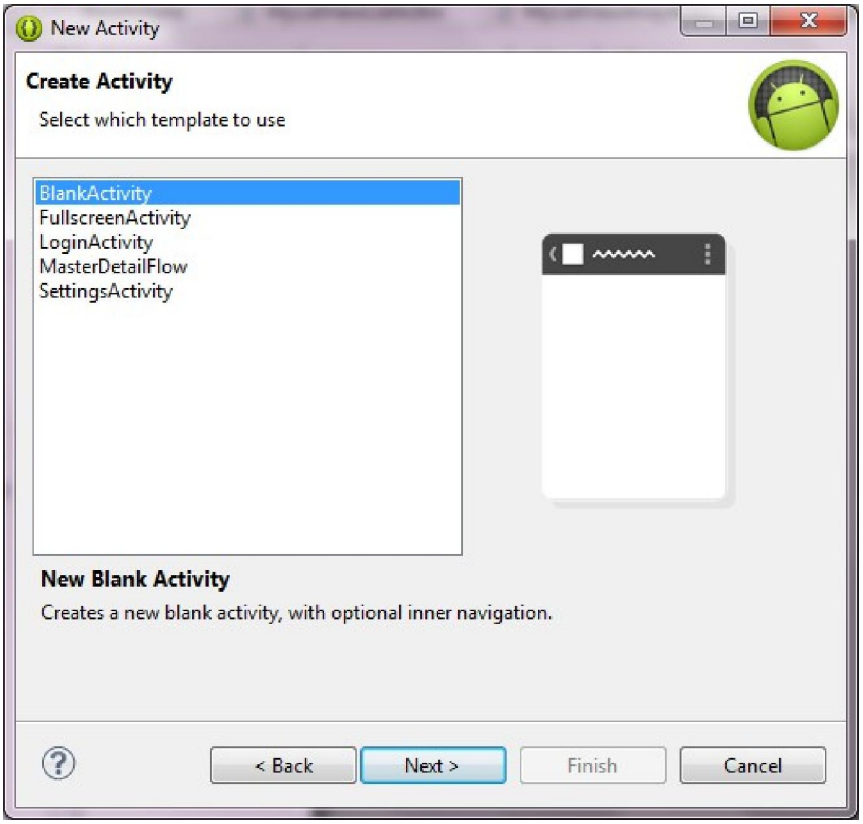


Gambar 8. 10 Outline activity_main

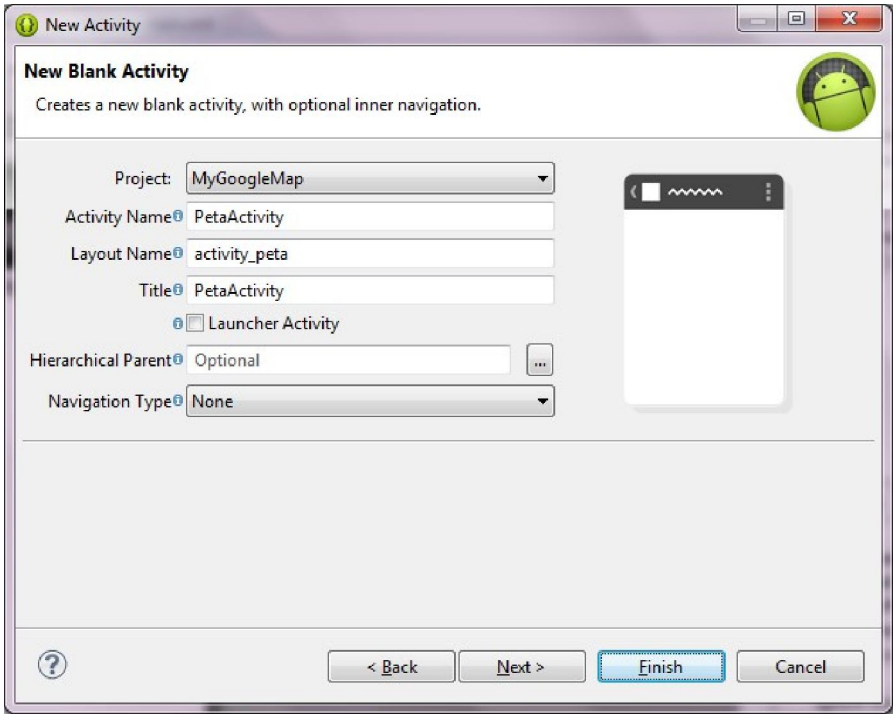
Tambahkan activity dengan cara klik kanan pada nama project, pilih new >> other.



Gambar 8. 11 Kotak dialog penambahan activity

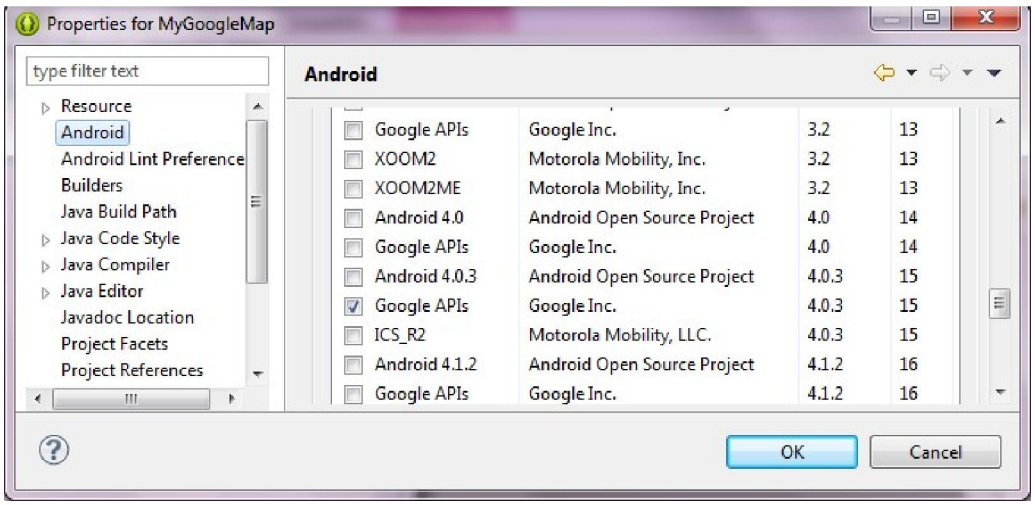


Gambar 8. 12 Kotak dialog pilih jenis activity



Gambar 8. 13 Kotak dialog penamaan activity

Pastikan package SDK yang digunakan adalah Google APIs.



Gambar 8. 14 Kotak dialogpackage SDK

Tambahkan script XML layout yang didapat dari Google Map API, sehingga menjadi sebagai berikut:

```
 <RelativeLayout
xmlns:android="http://schemas.android.com/apk/res/android"
     xmlns:tools="http://schemas.android.com/tools"
 android:layout_width="match_parent"
 android:layout_height="match_parent"
 tools:context=".PetaActivity" >

 <com.google.android.maps.MapView
 android:id="@+id/peta"
         android:layout_width="fill_parent"
 android:layout_height="fill_parent"
         android:apiKey="0Ba1o3C-
9FEqskBBnno33qmdUebQGjVt12dvUQA" />

</RelativeLayout>
```

Di dalam AndroidManifest.xml, di bawah tag uses-sdk tambahkan script:

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

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

Dan di dalam tag application tambahkan script:

```
<uses-library android:name="com.google.android.maps" />
```

Dalam source code java:

Double klik MainActivity.java dan ubah source code menjadi:

```
 package com.unpam.googlemapex;
 import java.util.ArrayList;
 import java.util.HashMap;
 import java.util.List;
 import java.util.Map;
 import android.app.Activity;
 import android.content.Intent;
 import android.os.Bundle;
 import android.view.Menu;
 import android.view.View;
 import android.widget.AdapterView;
 import android.widget.AdapterView.OnItemClickListener;
 import android.widget.ListView;
 import android.widget.SimpleAdapter;
 import android.widget.TextView;
  import
 com.google.android.maps.MapController;
 import com.google.android.maps.MapView;
  public class MainActivity extends Activity
 implements
OnItemClickListener {
  List<Map<String, String>> items = new ArrayList<Map<String,
String>>();
     ListView listView;
     MapView mapView;
     MapController mapController;

 final static String PROPINSI = "propinsi";
 final static String IBUKOTA = "ibukota";
 final static String LONGITUDE = "longitude";
 final static String LATITUDE = "latitude";

     @Override
     protected void onCreate(Bundle savedInstanceState) {
```

```
          super.onCreate(savedInstanceState);
          setContentView(R.layout.activity_main);

          TextView textView2 = (TextView)
findViewById(R.id.textView2);
          textView2.setText("");

          ListView listView = (ListView)
findViewById(R.id.listView);
          listView.setOnItemClickListener(this);
     registerForContextMenu(listView);
          Map<String, String> map;

             map = new HashMap<String, String>();
    map.put(PROPINSI, "Jawa Barat");
 map.put(IBUKOTA, "Bandung");
     map.put(LATITUDE, "-6.912063");
          map.put(LONGITUDE, "107.606084");
          items.add(map);

          map = new HashMap<String, String>();
     map.put(PROPINSI, "Jawa Tengah");
     map.put(IBUKOTA, "Semarang");
     map.put(LATITUDE, "-6.970239");
          map.put(LONGITUDE, "110.424404");
          items.add(map);

          map = new HashMap<String, String>();
     map.put(PROPINSI, "Jawa Timur");
     map.put(IBUKOTA, "Surabaya");
     map.put(LATITUDE, "-7.28866");
          map.put(LONGITUDE, "112.734311");
          items.add(map);

          String[] from = new String[] { PROPINSI, IBUKOTA,
LATITUDE, LONGITUDE };          int[] to = new int[] {
 R.id.textView1, R.id.textView2
};
       SimpleAdapter adapter = new SimpleAdapter(this, items,
R.layout.activity_main, from, to);
     listView.setAdapter(adapter);
     }
```

```
    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
   // Inflate the menu; this adds items to the action bar if
                      it is present.
          getMenuInflater().inflate(R.menu.activity_main,
 menu);         return true;
    }

    @Override
  public void onItemClick(AdapterView<?> arg0, View arg1, int
arg2, long arg3) {
          // TODO Auto-generated method stub
       Intent intent = new Intent(this, PetaActivity.class);
          intent.putExtra(PROPINSI,
items.get(arg2).get(PROPINSI));
           intent.putExtra(IBUKOTA, items.get(arg2).get(IBUKO
          intent.putExtra(LONGITUDE,
items.get(arg2).get(LONGITUDE));
 intent.putExtra(LATITUDE, items.get(arg2).get(LATITUDE));
          startActivity(intent);
    }

}
```

Double klik PetaActivity.java dan ubah source code menjadi:

```
 package com.unpam.googlemapex;

 import java.util.ArrayList;

 import android.app.AlertDialog;
 import android.graphics.drawable.Drawable;
 import android.os.Bundle; import android.view.Menu;
 import com.google.android.maps.GeoPoint; import
 com.google.android.maps.ItemizedOverlay; import
 com.google.android.maps.MapActivity; import
 com.google.android.maps.MapController; import
 com.google.android.maps.MapView; import
 com.google.android.maps.MyLocationOverlay;
 import com.google.android.maps.OverlayItem;

 public class PetaActivity extends MapActivity {
    MapView mapView;
    MapController mapController;

    @Override
```

```
     protected void onCreate(Bundle savedInstanceState) {
          super.onCreate(savedInstanceState);
          setContentView(R.layout.activity_peta);

          mapView = (MapView) findViewById(R.id.peta);
     mapController = mapView.getController();
          mapView.setClickable(true);
     mapView.setEnabled(true);
     mapView.setBuiltInZoomControls(true);
     mapController.setZoom(16);

          // overlay my location          final
 MyLocationOverlay myLocationOverlay = new
MyLocationOverlay(this,mapView);
     myLocationOverlay.enableCompass();
     myLocationOverlay.enableMyLocation();
     myLocationOverlay.runOnFirstFix(new Runnable() {
          public void run() {

     mapController.animateTo(myLocationOverlay.getMyLocation());
               }
          });
          mapView.getOverlays().add(myLocationOverlay);
HelloItemizedOverlay helloItemizedOverlay;
          Bundle extra = getIntent().getExtras();
          GeoPoint p;
          OverlayItem item;
          Drawable drawable;

              // cek apakah extra tidak kosong            if
(extra != null) {
String namaPropinsi =
extra.getString(MainActivity.PROPINSI);
               String longitude =
extra.getString(MainActivity.LONGITUDE);
               String latitude =
extra.getString(MainActivity.LATITUDE);
               String ibukota =
extra.getString(MainActivity.IBUKOTA);

               drawable =
this.getResources().getDrawable(R.drawable.ic_launcher);
          helloItemizedOverlay = new
```

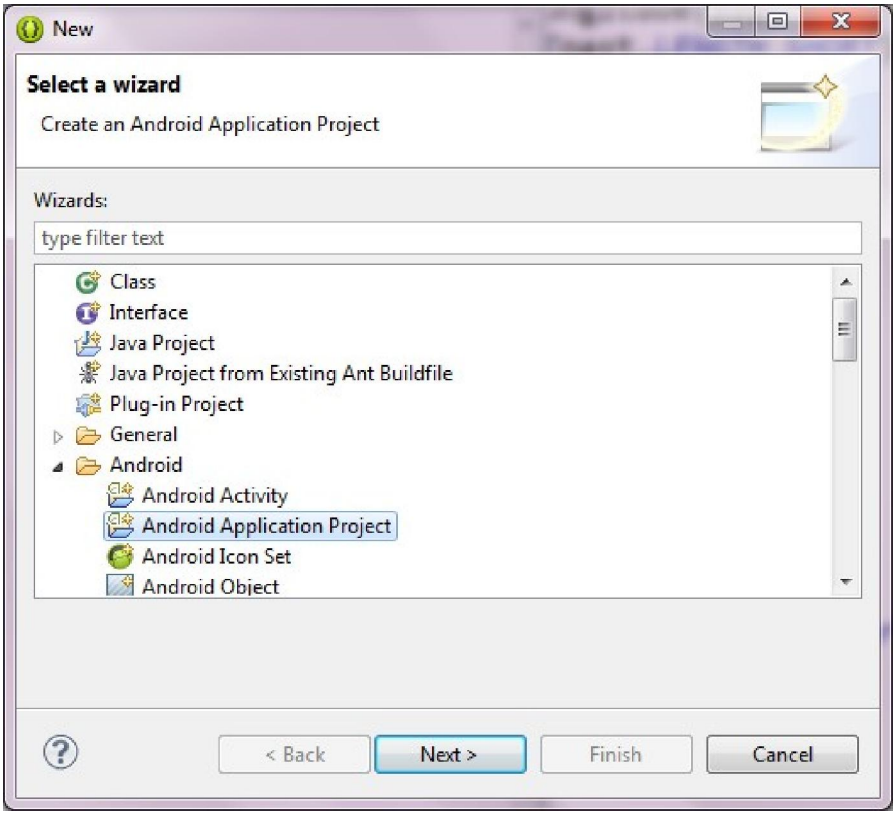
```
HelloItemizedOverlay(drawable);
                p = new GeoPoint(
                          (int) (Double.parseDouble(latitude) *
1E6),
                         (int) (Double.parseDouble(longitude) *
1E6));

                // buat OverlayItem dari extra
                item = new OverlayItem(p, namaPropinsi,
 ibukota);                 helloItemizedOverlay.addItem(item);
                mapView.getOverlays().add(helloItemizedOverlay);
                mapController.animateTo(p);
           }
     }

     @Override
     public boolean onCreateOptionsMenu(Menu menu) {
    // Inflate the menu; this adds items to the action bar if it
                          is present.
           getMenuInflater().inflate(R.menu.activity_peta,
 menu);          return true;
     }

     @Override
     protected boolean isRouteDisplayed() {
           // TODO Auto-generated method
 stub
           return false;
     }

     private ArrayList<OverlayItem> items = new
ArrayList<OverlayItem>();
    private class HelloItemizedOverlay extends
ItemizedOverlay<OverlayItem> {        public
 HelloItemizedOverlay(Drawable defaultMarker) {
     super(boundCenterBottom(defaultMarker));
           }

           @Override
           protected OverlayItem createItem(int i) {
           return items.get(i);
           }
```

```
                                    @Override
public int size() {
                return items.size();
          }

          public void addItem(OverlayItem overlay) {
          items.add(overlay);
                populate();
          }

          @Override
          protected boolean onTap(int index) {
     OverlayItem item = items.get(index);

                // munculkan Alert Dialog yang menampilkan title
dan snippet
                AlertDialog.Builder dialog = new
AlertDialog.Builder(PetaActivity.this);
                dialog.setTitle(item.getTitle());
                dialog.setMessage(item.getSnippet());
          dialog.show();

                return true;
          }
     }

}
```

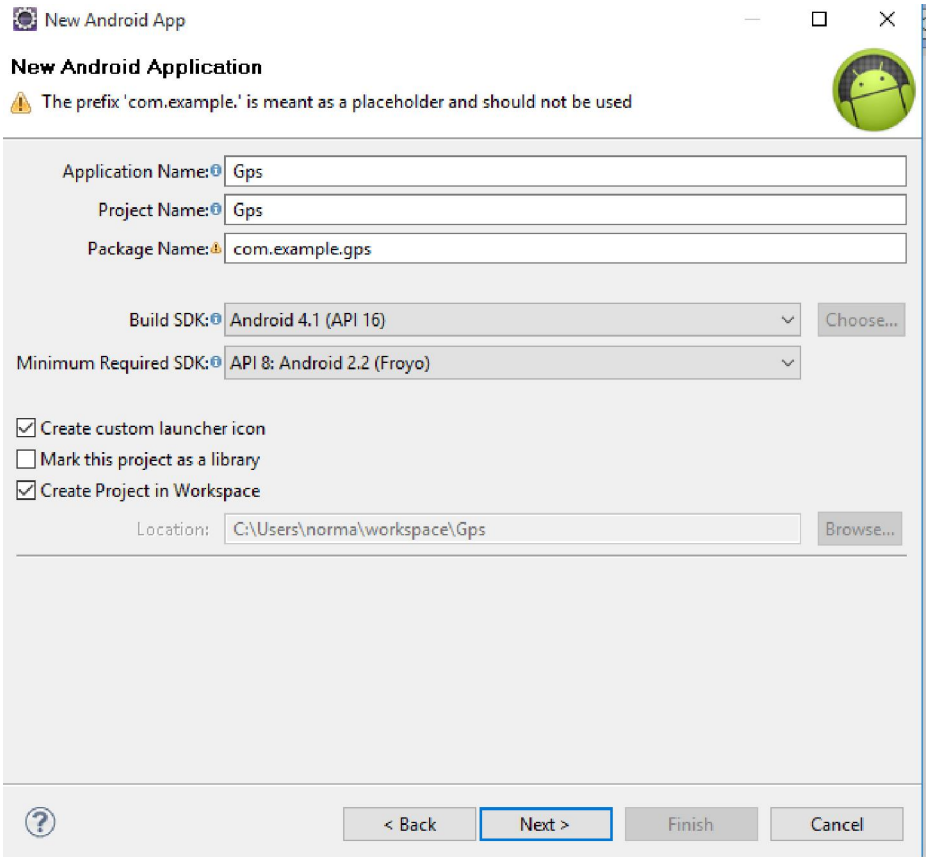
Untuk mengeksekusi, klik kanan pada nama project atau pilih menu Run, kemudian pilih Run As >> Android Application.

Tujuan Pembelajaran 8.3:
Membuat Aplikasi GPS

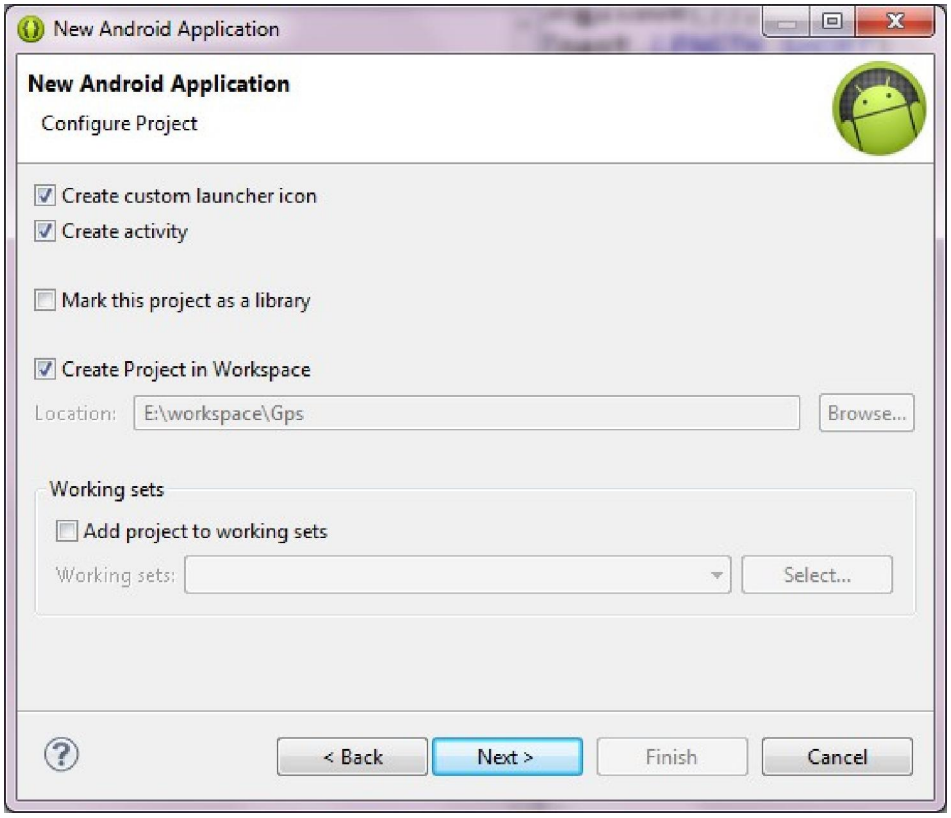
Untuk membuat aplikasi GSP, pilih menu File >> New >> Other sehingga tampil kotak dialog sebagai berikut:



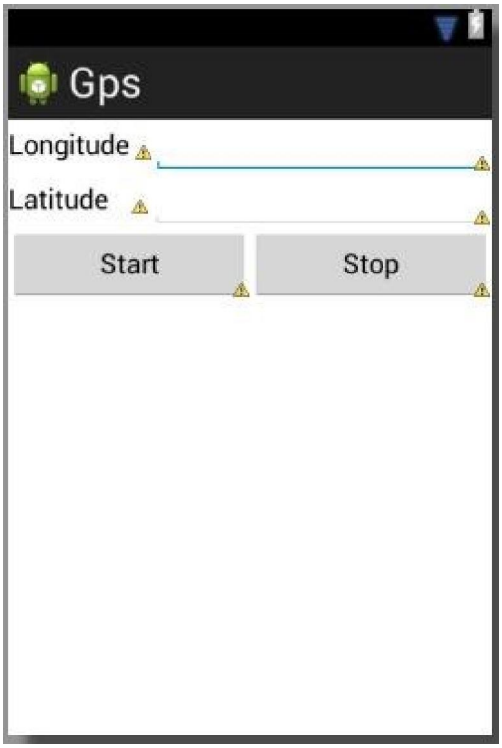
Gambar 8. 15 Kotak dialog New Android Application Project



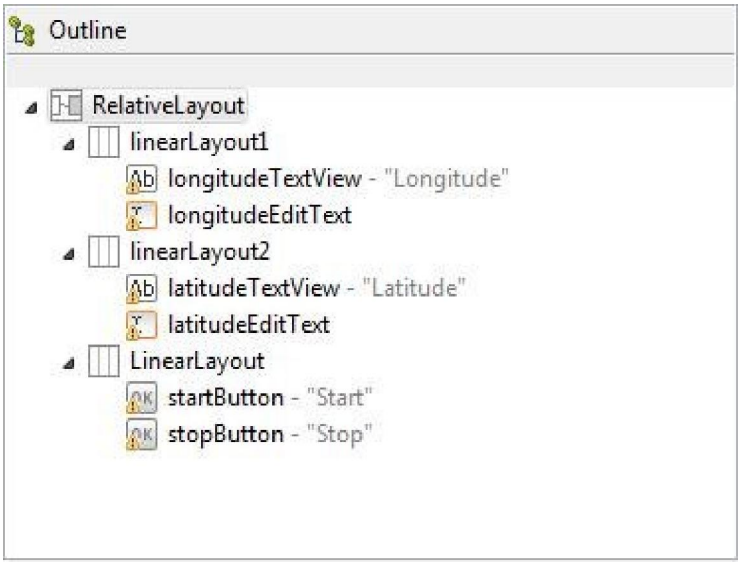
Gambar 8.16Kotak dialog penamaan Project



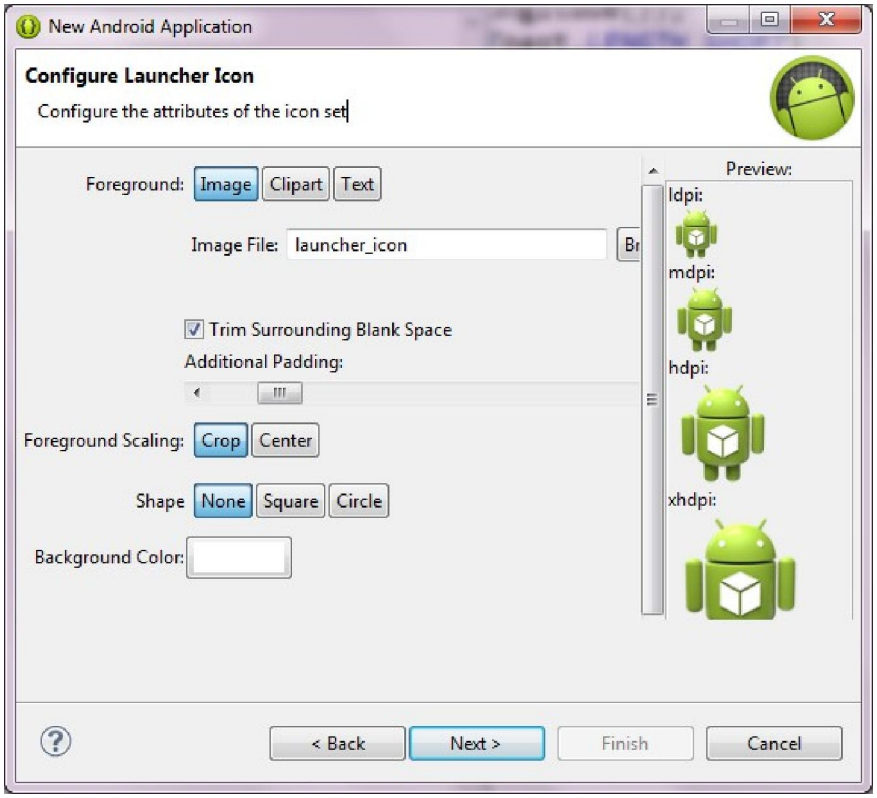
Gambar 8.17 Kotak Dialog penentuan lokasi project



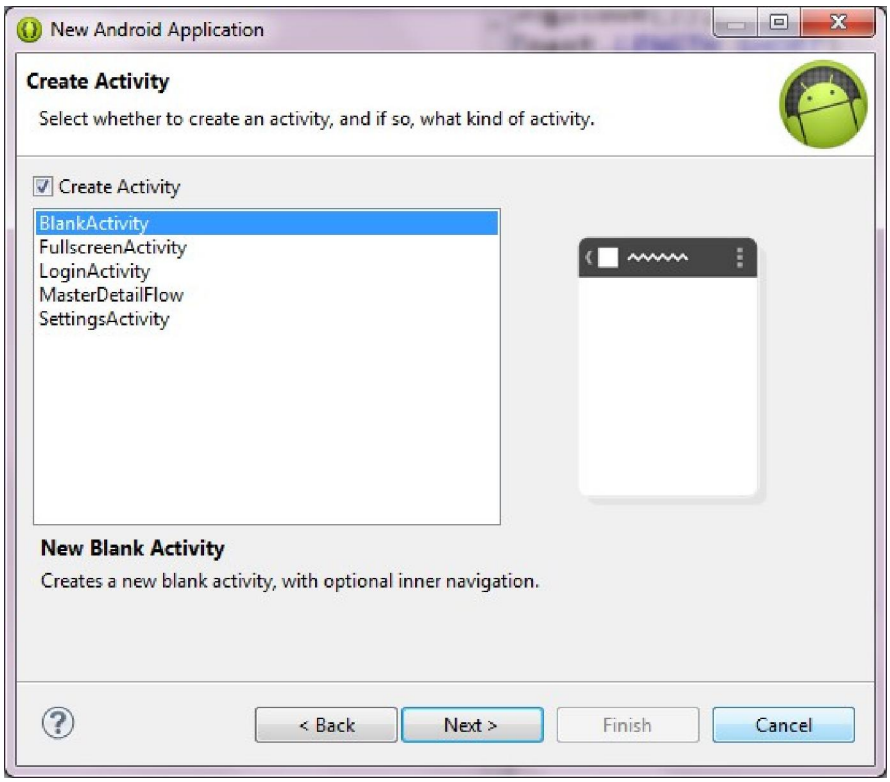
Gambar 8.18 Desain Project aplikasi GPS



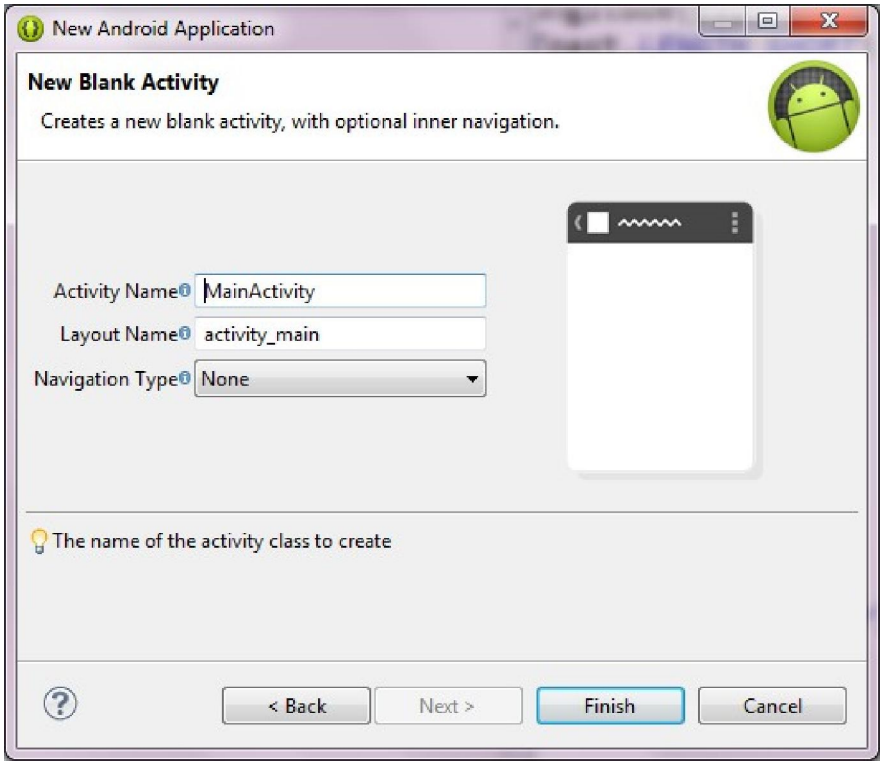
Gambar 8.19 Outline project aplikasi GPS



Gambar 8.20 Kotak dialog konfigurasi launcher icon



Gambar 8.21 Kotak dialog pilih jenis activity



Gambar 8.22 Kotak dialog penamaan activity

Ubah source code dari MainActivity.java menjadi seperti berikut ini:

```
 package com.unpam.gps;
 import android.app.Activity;
 import android.content.Context;
 import android.location.Location;
 import android.location.LocationListener;
 import android.location.LocationManager;
 import android.os.Bundle;
 import android.view.Menu;
 import android.view.View;
 import android.view.View.OnClickListener; import
 android.widget.EditText;
 import android.widget.Toast;
 publicclass MainActivity extends Activity implements
OnClickListener{
      LocationManager locationManager;
            EditText longitudeEditText, latitudeEditText;
   @Override
protectedvoid onCreate(Bundle savedInstanceState) {
           super.onCreate(savedInstanceState);
           setContentView(R.layout.activity_main);
```

```
            longitudeEditText = (EditText)
findViewById(R.id.longitudeEditText);
      latitudeEditText = (EditText)
findViewById(R.id.latitudeEditText);

      findViewById(R.id.startButton).setOnClickListener(this);
            findViewById(R.id.stopButton).setOnClickListener(this);
      locationManager = (LocationManager)
getSystemService(Context.LOCATION_SERVICE);
      }

      @Override
       publicboolean onCreateOptionsMenu(Menu menu) {
     // Inflate the menu; this adds items to the action bar if it is
                                present.
            getMenuInflater().inflate(R.menu.activity_main, menu);
      returntrue;
      }

      LocationListener locationListener = new LocationListener() {
            @Override
             publicvoid onStatusChanged(String provider, int
status, Bundle extras) {}
            @Override
             publicvoid onProviderEnabled(String provider) {}
            @Override
             publicvoid onProviderDisabled(String provider) {}
            @Override
            publicvoid onLocationChanged(Location location) {
            // Menampilkan koordinat berdasarkan location

      latitudeEditText.setText(Double.toString(location.getLatitude
()));

 longitudeEditText.setText(Double.toString(location.getLongitu de()));
                  Toast.makeText(MainActivity.this, "Dapat lokasi",
Toast.LENGTH_SHORT).show();
            }
      };

       protectedvoid onPause() {
            locationManager.removeUpdates(locationListener);
super.onPause();
      };
```

```
      @Override
       publicvoid onClick(View v) {
            // TODO Auto-generated method stub
                        switch (v.getId()) {        case
R.id.startButton:
locationManager.requestLocationUpdates(LocationManager.NETWORK_PROVIDE
R, 60000, 0, locationListener);                                  break;
case R.id.stopButton:
      locationManager.removeUpdates(locationListener);
                  break;
      }
      }

}
```

Di dalam AndroidManifest.xml, di bawah tag uses-sdk tambahkan script:

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

Dan di dalam tag application tambahkan script:

```
<uses-library android:name="com.google.android.maps" />
```

C. SOAL LATIHAN/TUGAS

1. Buatlah project untuk menampilkan 3 Lokasi yang sering Anda kunjungi, contoh: lokasi Anda saat ini, Lokasi Rumah dan Lokasi Kantor Anda!
2. Dari Project membuat aplikasi GPS, tambahkan 1 (satu) BUTTON untuk menampilkan Peta Lokasi (MAP)!

D. DAFTAR PUSTAKA

Allen, Grant. 2012. Beginning Android 4. New York : Apress.

Safaat, H. Nazruddin. 2015. ANDROID Pemrograman Aplikasi Mobile Smartphone dan Tablet PC Berbasis Android. Bandung: Informatika