Mobile Application Development

Higher Diploma in Science in Computer Science

Produced by

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http://www.wit.ie

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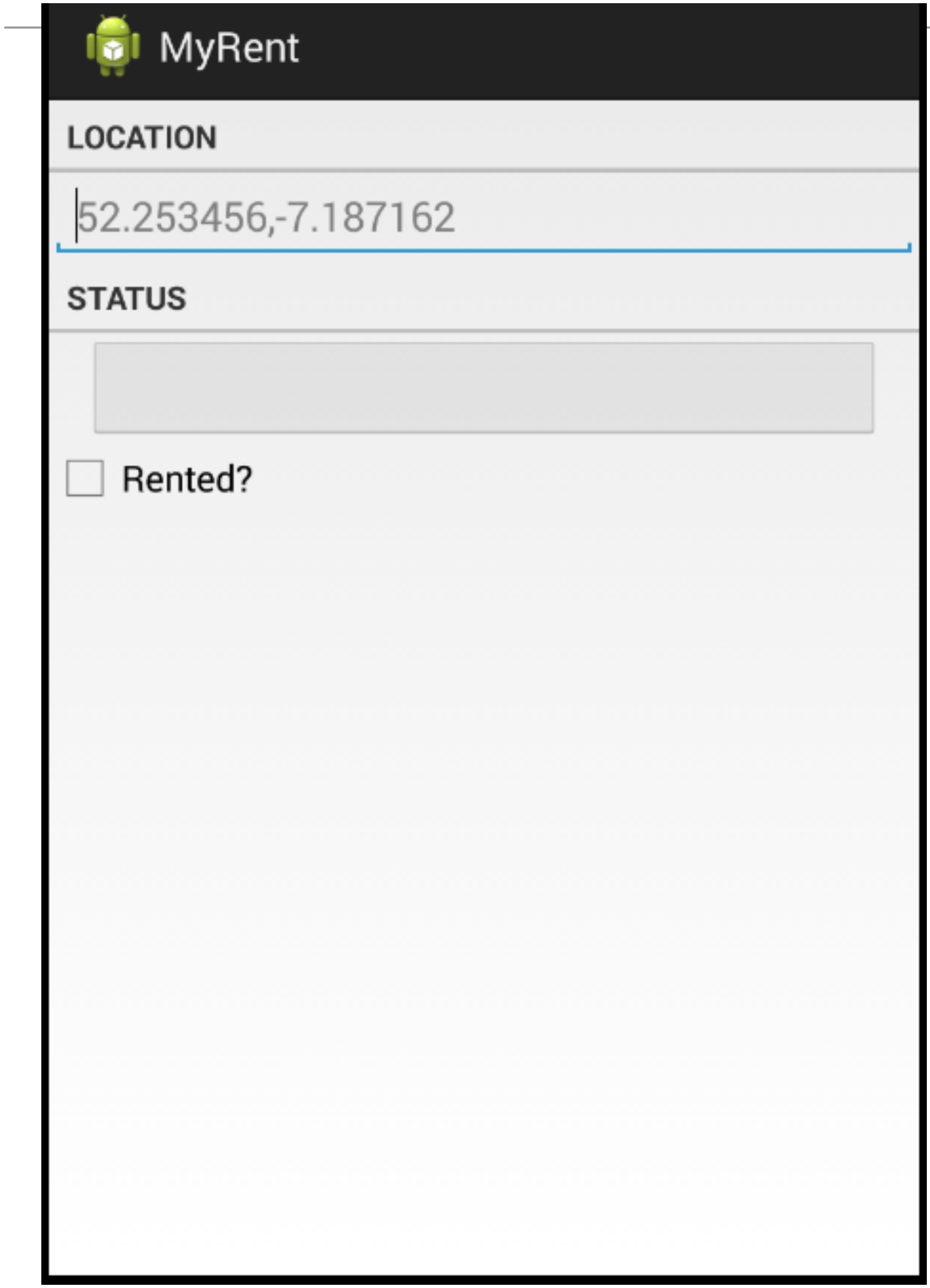
eLearning support unit

MyRent v01-03

Version 01



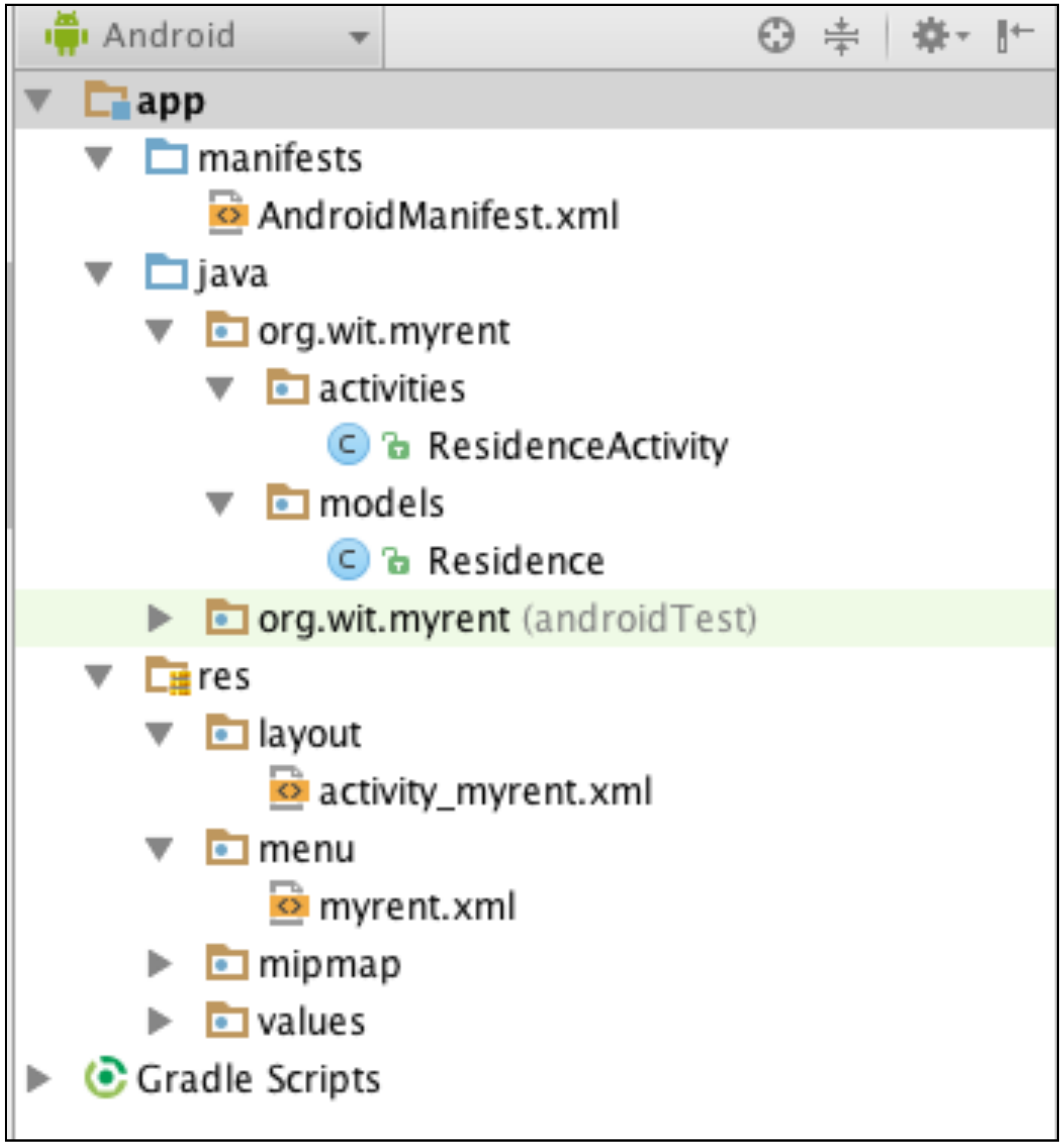
MyRent

LOCATION

52.253456,-7.187162

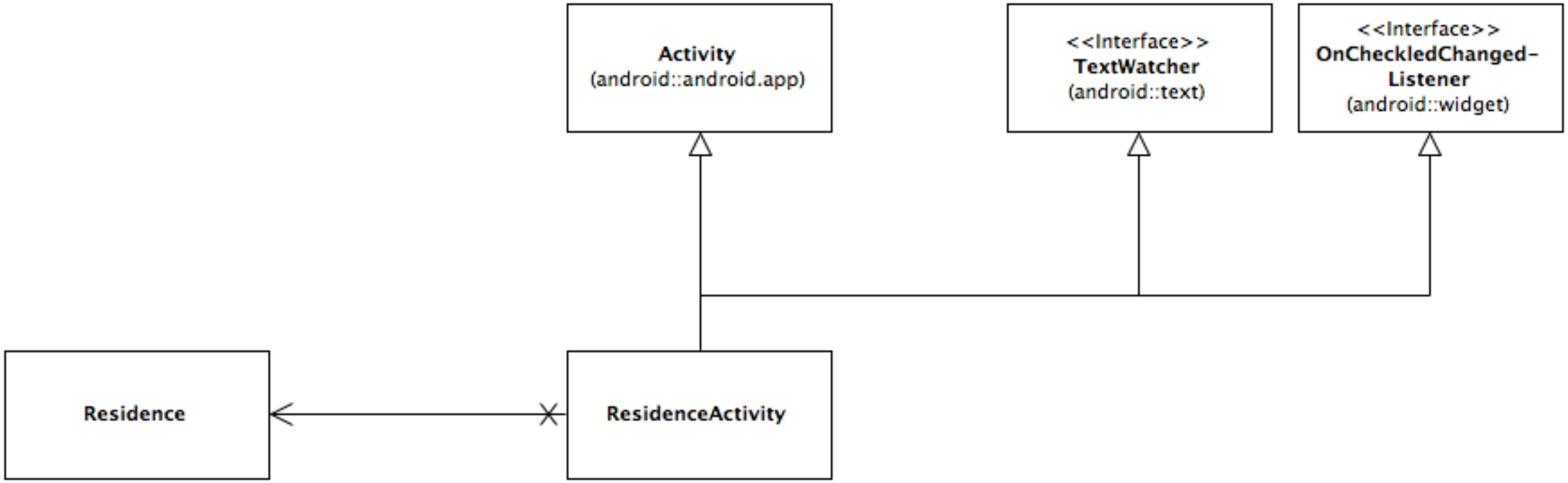
STATUS

□ Rented?



```
Android
▼ app
  ▼ manifests
      AndroidManifest.xml
  ▼ java
    ▼ org.wit.myrent
      ▼ activities
          ResidenceActivity
      ▼ models
          Residence
    ▶ org.wit.myrent (androidTest)
  ▼ res
    ▼ layout
        activity_myrent.xml
    ▼ menu
        myrent.xml
    ▶ mipmap
    ▶ values
▶ Gradle Scripts
```

MyRent-v01 UML



Model Class

- UUID - a unique id for an object

```
public class Residence
{
  public UUID id;

  public String  geolocation;
  public Date    date;
  public boolean rented;

  public Residence()
  {
    id = UUID.randomUUID();
    this.date = new Date();
  }

  public String getDateString()
  {
    return "Registered: " + DateFormat.getDateTimeInstance().format(date);
  }
}
```

ResidenceActivity

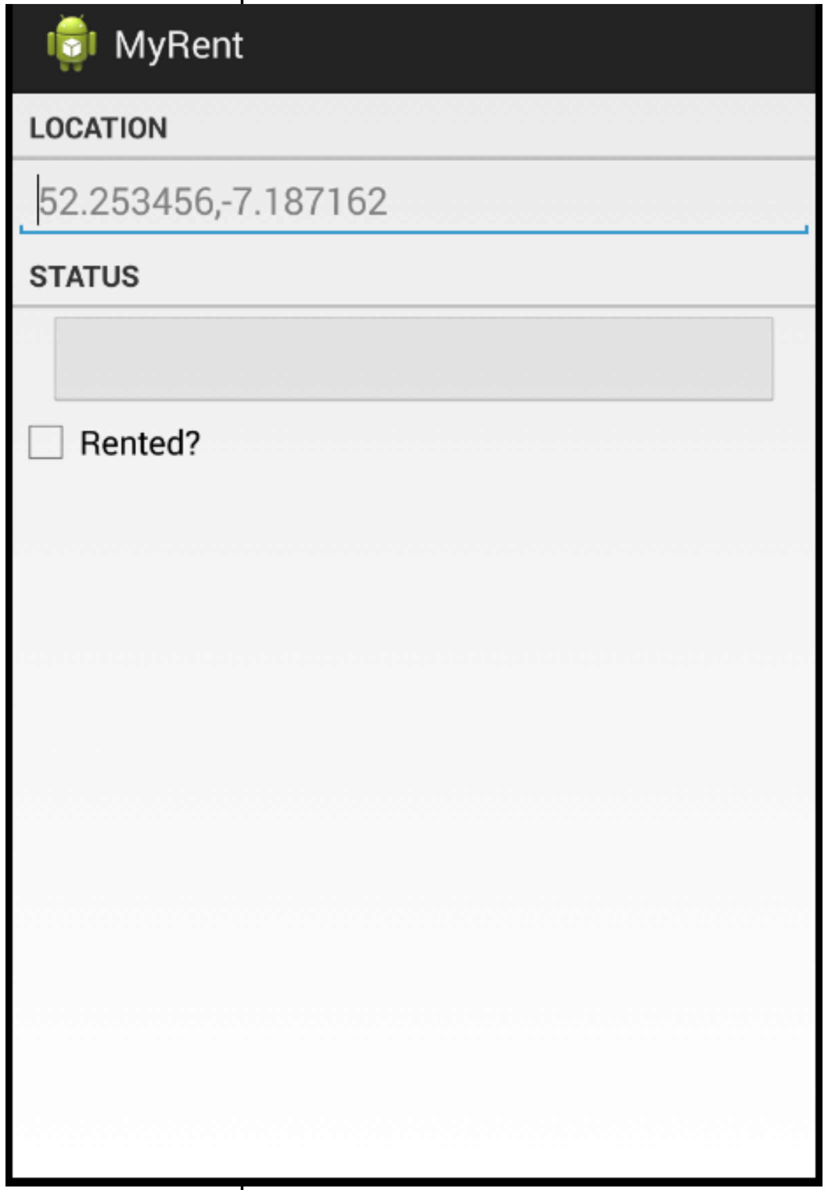
```
public class ResidenceActivity extends Activity implements TextWatcher, OnCheckedChangeListener
{
  private EditText geolocation;
  private CheckBox rented;
  private Button   dateButton;
  private Residence residence;

  @Override
  public void onCreate(Bundle savedInstanceState)
  {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_residence);

    geolocation = (EditText) findViewById(R.id.geolocation);
    dateButton  = (Button)   findViewById(R.id.registration_date);
    rented      = (CheckBox) findViewById(R.id.isrented);

    residence = new Residence();

    geolocation.addTextChangedListener(this);
    geolocation.setText(residence.geolocation);
    dateButton .setEnabled(false);
    rented     .setChecked(residence.rented);
    rented     .setOnCheckedChangeListener(this);
  }
  @Override
  public void onCheckedChanged(CompoundButton arg0, boolean isChecked)
  {
    Log.i(this.getClass().getSimpleName(), "rented Checked");
    residence.rented = isChecked;
  }
  @Override
  public void afterTextChanged(Editable c)
  {
    Log.i(this.getClass().getSimpleName(), "geolocation " + c.toString());
    residence.geolocation = c.toString();
  }
  @Override
  public void beforeTextChanged(CharSequence arg0, int arg1, int arg2, int arg3)
  {}
  @Override
  public void onTextChanged(CharSequence arg0, int arg1, int arg2, int arg3)
  {}
}
```



MyRent

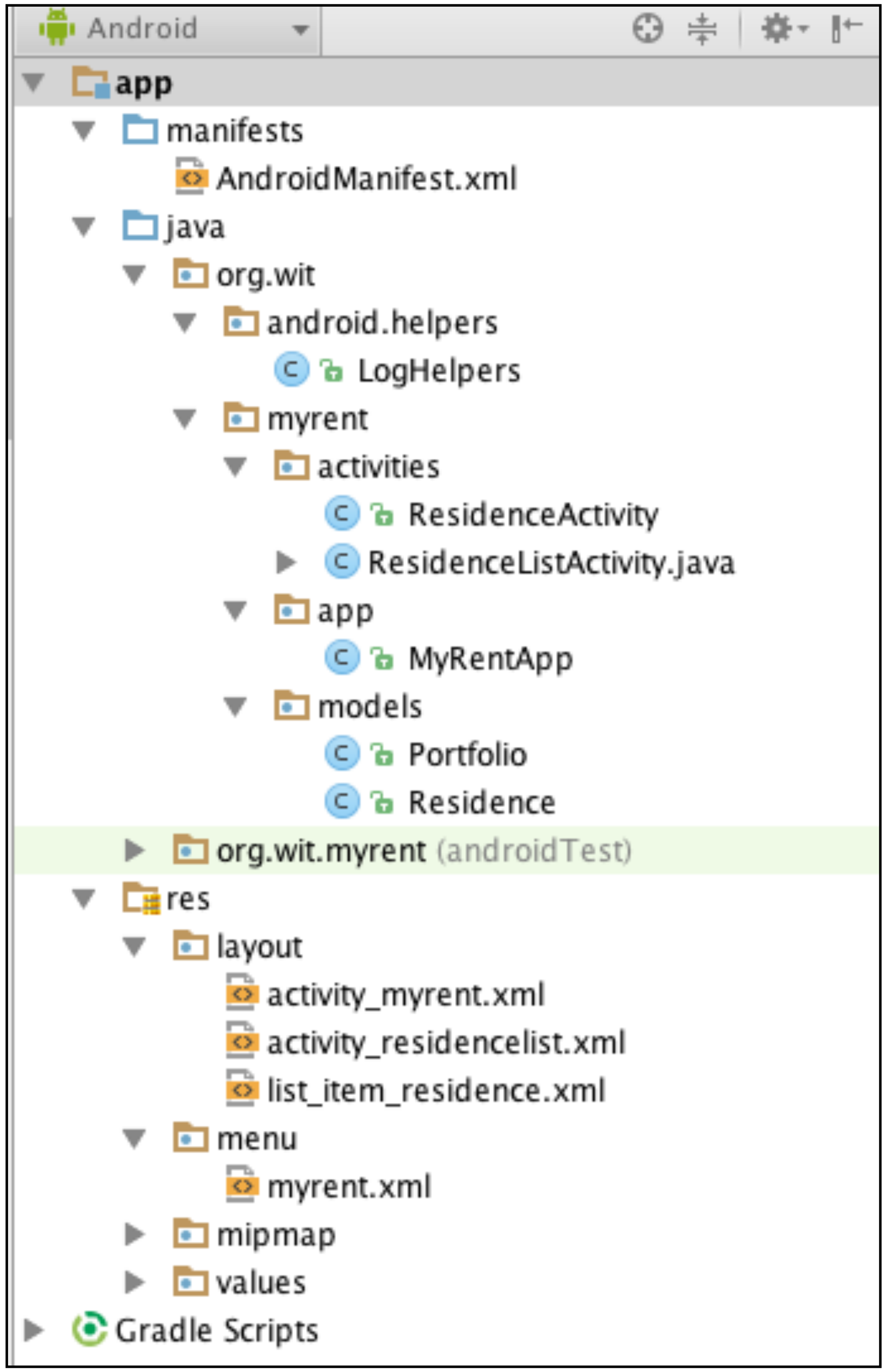
LOCATION

52.253456,-7.187162

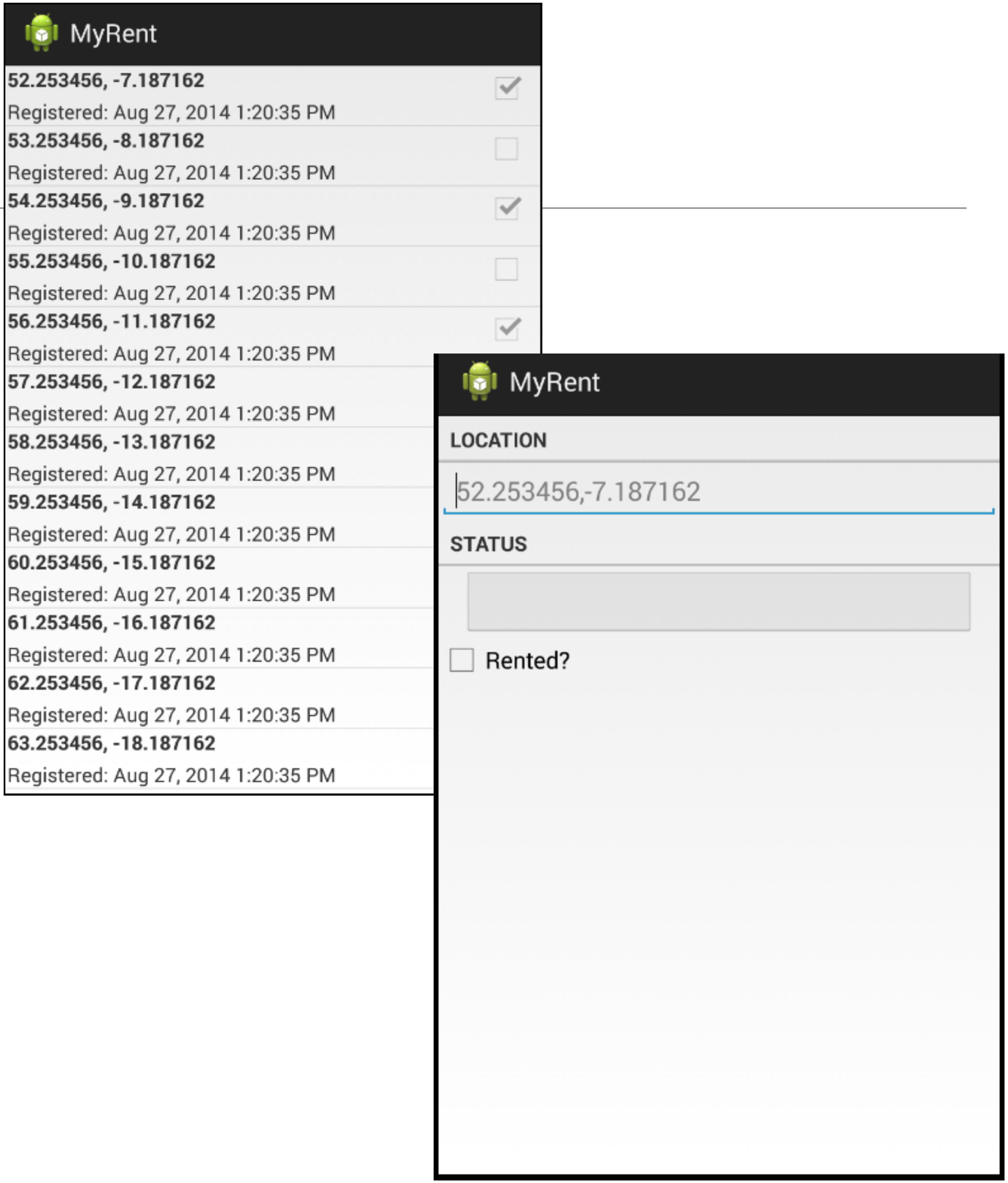
STATUS

□ Rented?

MyRent v02



```
▼ app
    ▼ manifests
          AndroidManifest.xml
    ▼ java
        ▼ org.wit
            ▼ android.helpers
                  LogHelpers
            ▼ myrent
                ▼ activities
                      ResidenceActivity
                    ▶ ResidenceListActivity.java
                ▼ app
                      MyRentApp
                ▼ models
                      Portfolio
                      Residence
        ▶ org.wit.myrent (androidTest)
    ▼ res
        ▼ layout
              activity_myrent.xml
              activity_residencelist.xml
              list_item_residence.xml
        ▼ menu
              myrent.xml
        ▶ mipmap
        ▶ values
▶ Gradle Scripts
```



52.253456, -7.187162 ☑
Registered: Aug 27, 2014 1:20:35 PM

53.253456, -8.187162 □
Registered: Aug 27, 2014 1:20:35 PM

54.253456, -9.187162 ☑
Registered: Aug 27, 2014 1:20:35 PM

55.253456, -10.187162 □
Registered: Aug 27, 2014 1:20:35 PM

56.253456, -11.187162 ☑
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57.253456, -12.187162
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Registered: Aug 27, 2014 1:20:35 PM

59.253456, -14.187162
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60.253456, -15.187162
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LOCATION

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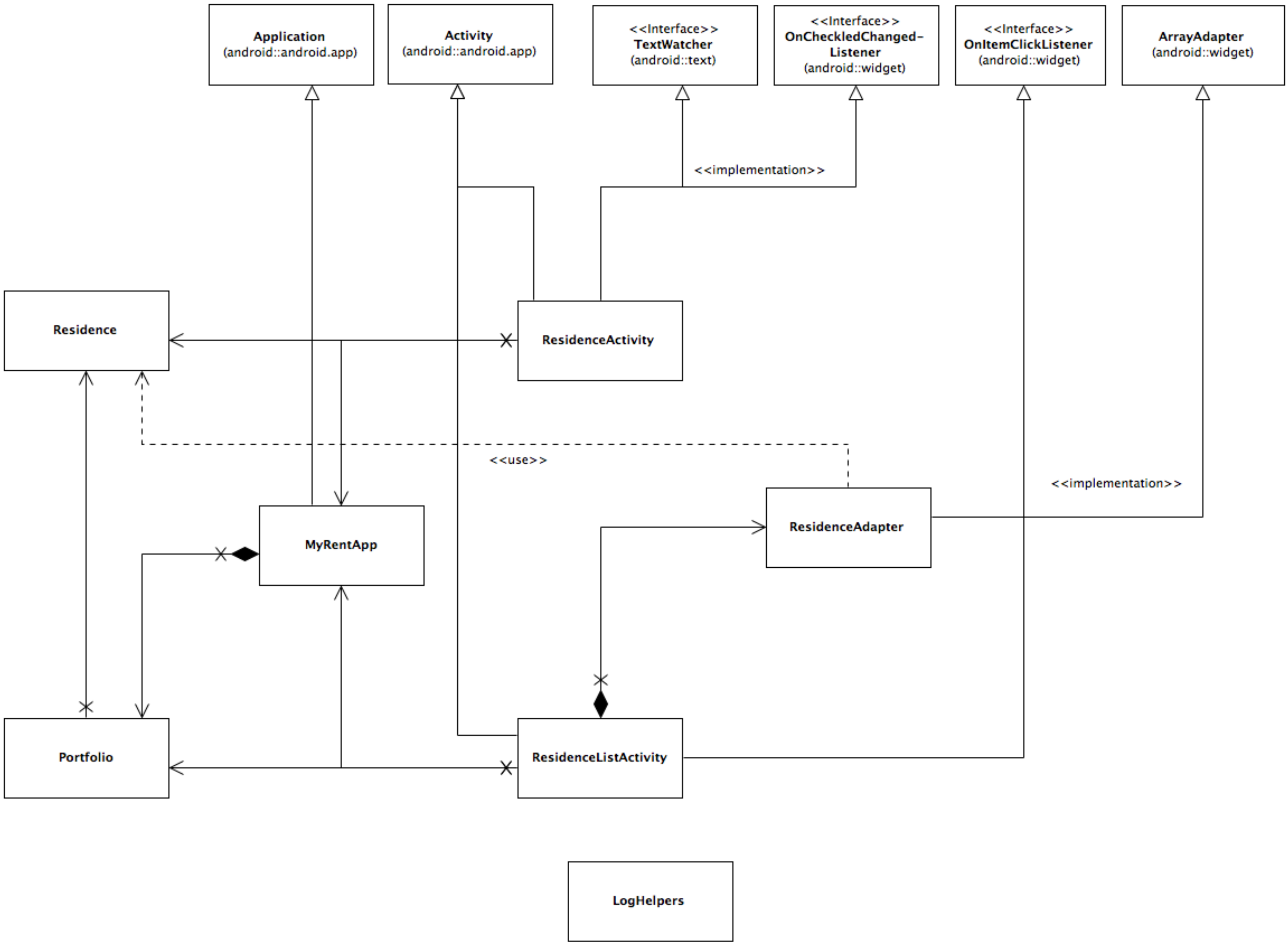
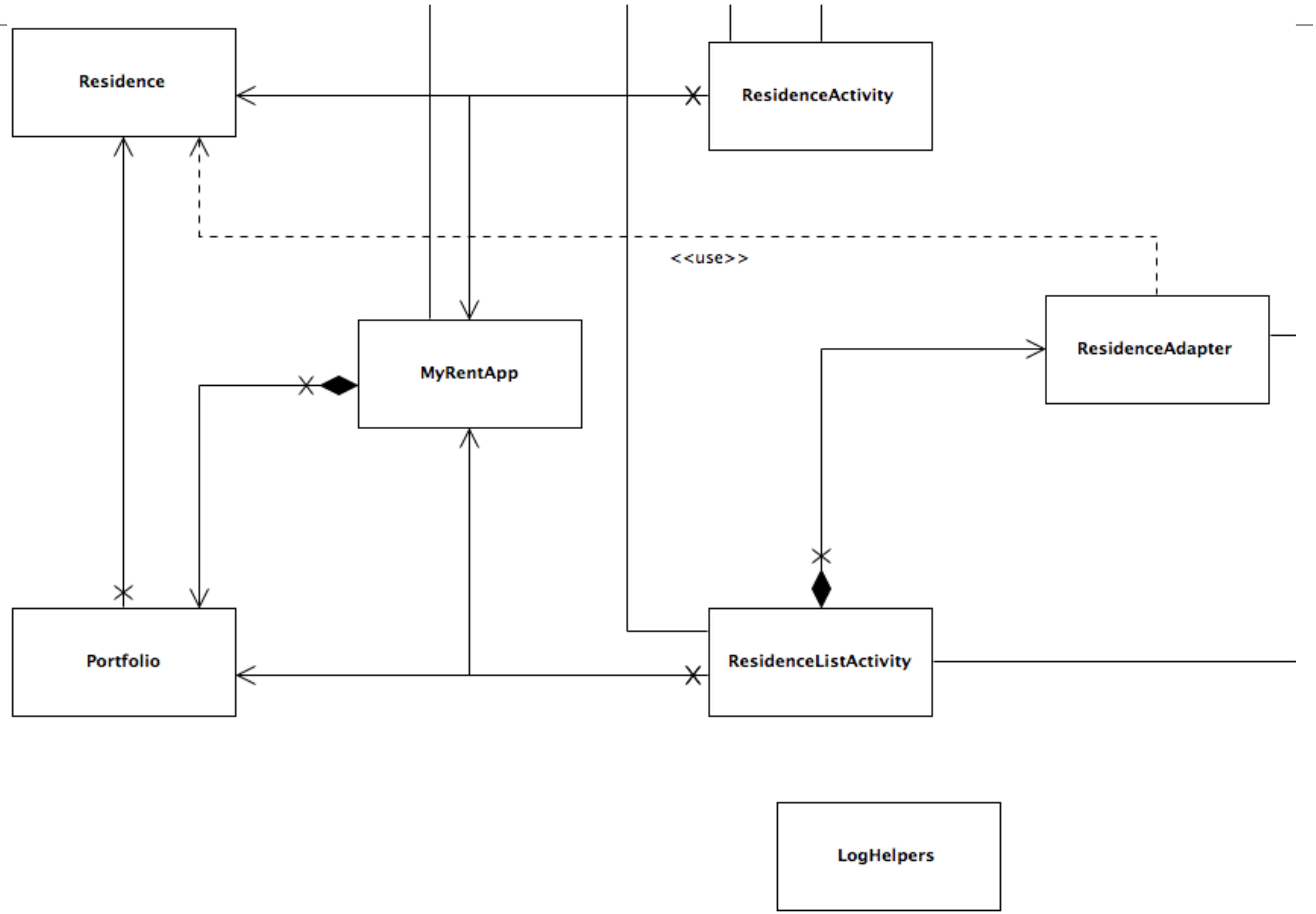
STATUS

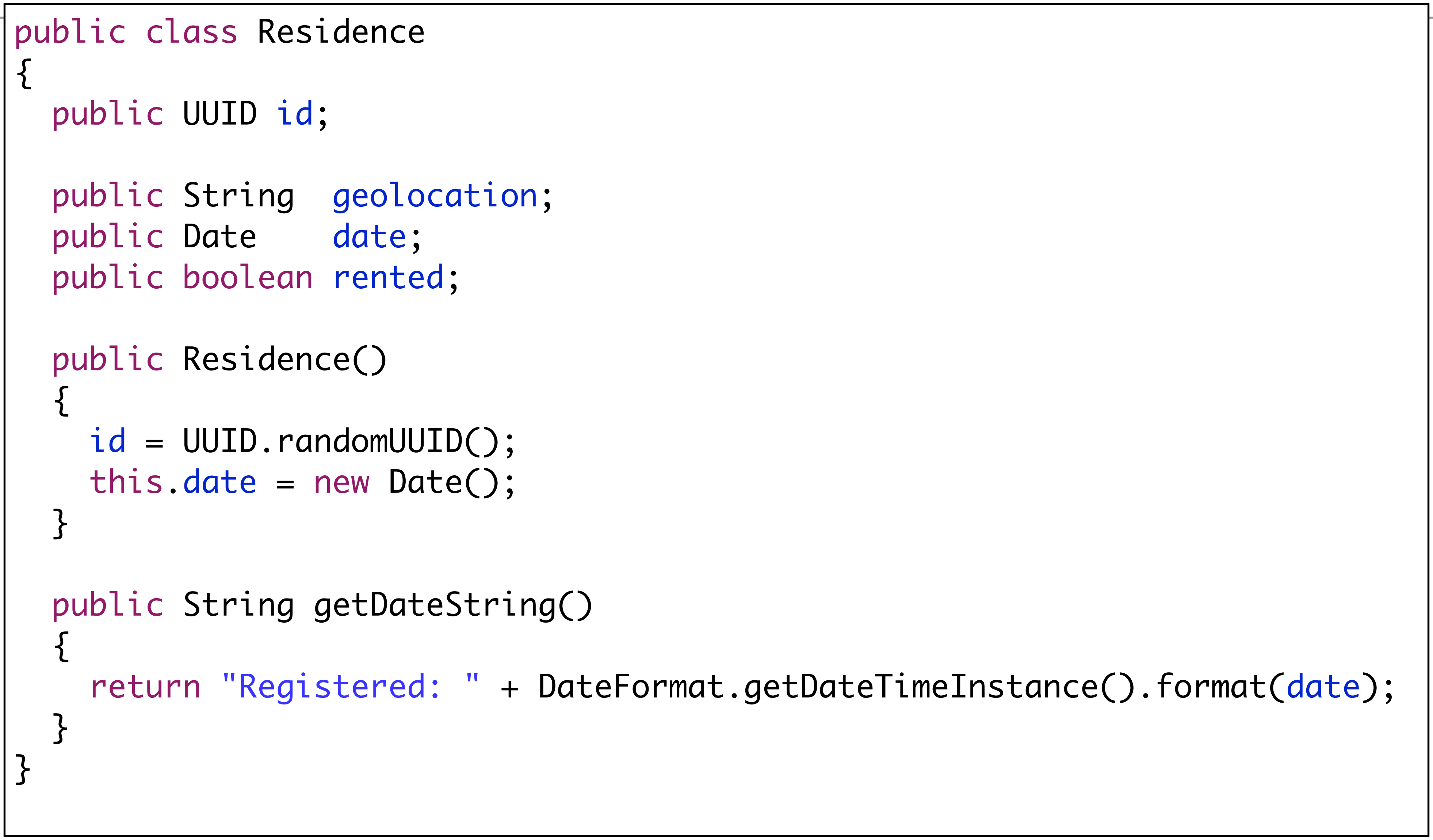
□ Rented?


Application
(android::android.app)
Activity
(android::android.app)
<<Interface>>
TextWatcher
(android::text)
<<Interface>>
OnCheckledChanged-Listener
(android::widget)
<<Interface>>
OnItemClickListener
(android::widget)
ArrayAdapter
(android::widget)
<<implementation>>
Residence
ResidenceActivity
<<use>>
<<implementation>>
MyRentApp
ResidenceAdapter
Portfolio
ResidenceListActivity
LogHelpers

MyRent-v02 UML

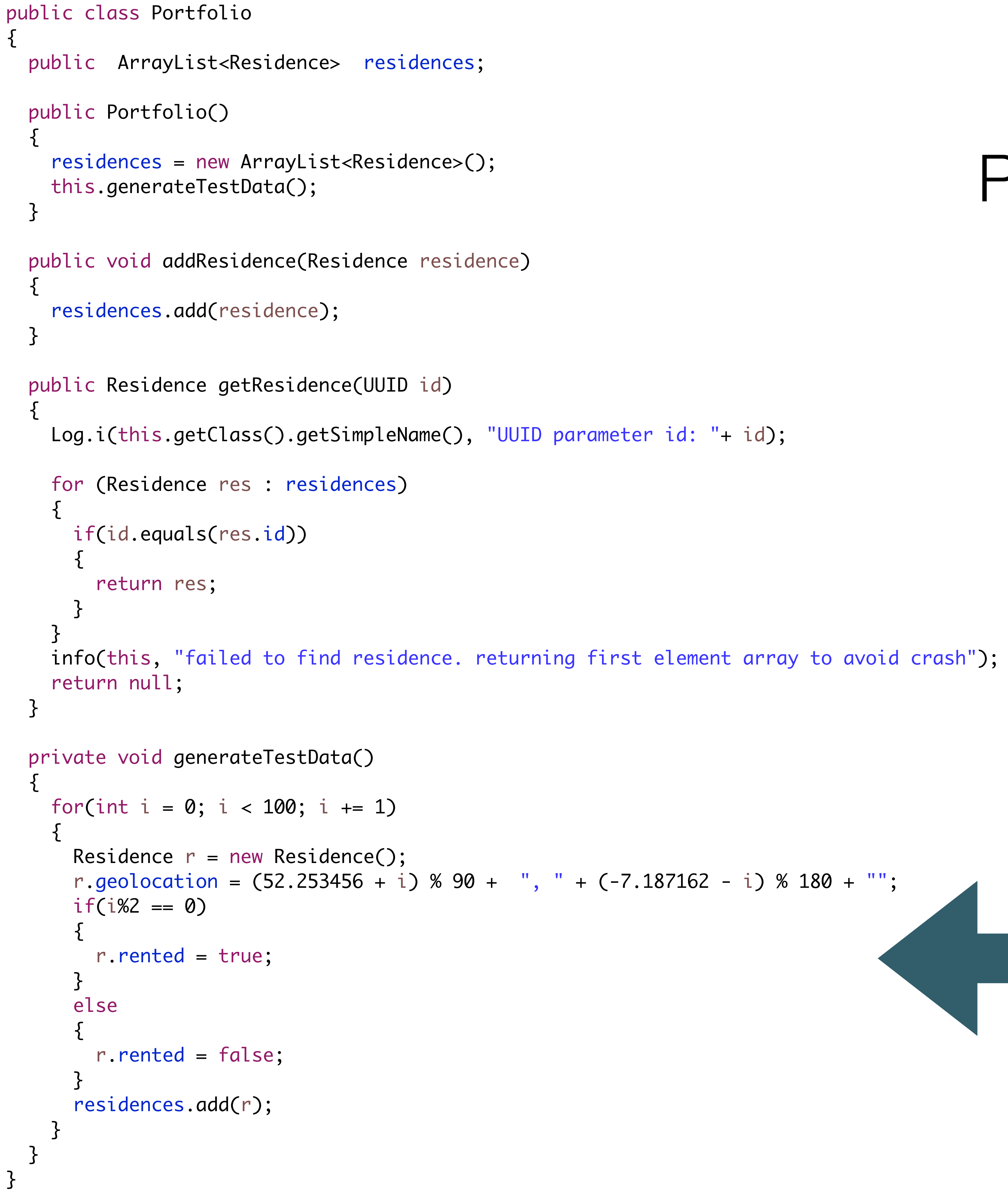


Residence



```
public class Residence
{
  public UUID id;

  public String  geolocation;
  public Date    date;
  public boolean rented;

  public Residence()
  {
    id = UUID.randomUUID();
    this.date = new Date();
  }

  public String getDateString()
  {
    return "Registered: " + DateFormat.getDateTimeInstance().format(date);
  }
}
```

Portfolio



```
public class Portfolio
{
  public  ArrayList<Residence>  residences;

  public Portfolio()
  {
    residences = new ArrayList<Residence>();
    this.generateTestData();
  }

  public void addResidence(Residence residence)
  {
    residences.add(residence);
  }

  public Residence getResidence(UUID id)
  {
    Log.i(this.getClass().getSimpleName(), "UUID parameter id: "+ id);

    for (Residence res : residences)
    {
      if(id.equals(res.id))
      {
        return res;
      }
    }
    info(this, "failed to find residence. returning first element array to avoid crash");
    return null;
  }

  private void generateTestData()
  {
    for(int i = 0; i < 100; i += 1)
    {
      Residence r = new Residence();
      r.geolocation = (52.253456 + i) % 90 +  ", " + (-7.187162 - i) % 180 + "";
      if(i%2 == 0)
      {
        r.rented = true;
      }
      else
      {
        r.rented = false;
      }
      residences.add(r);
    }
  }
}
```

- Generate random Residence objects to exercise UI

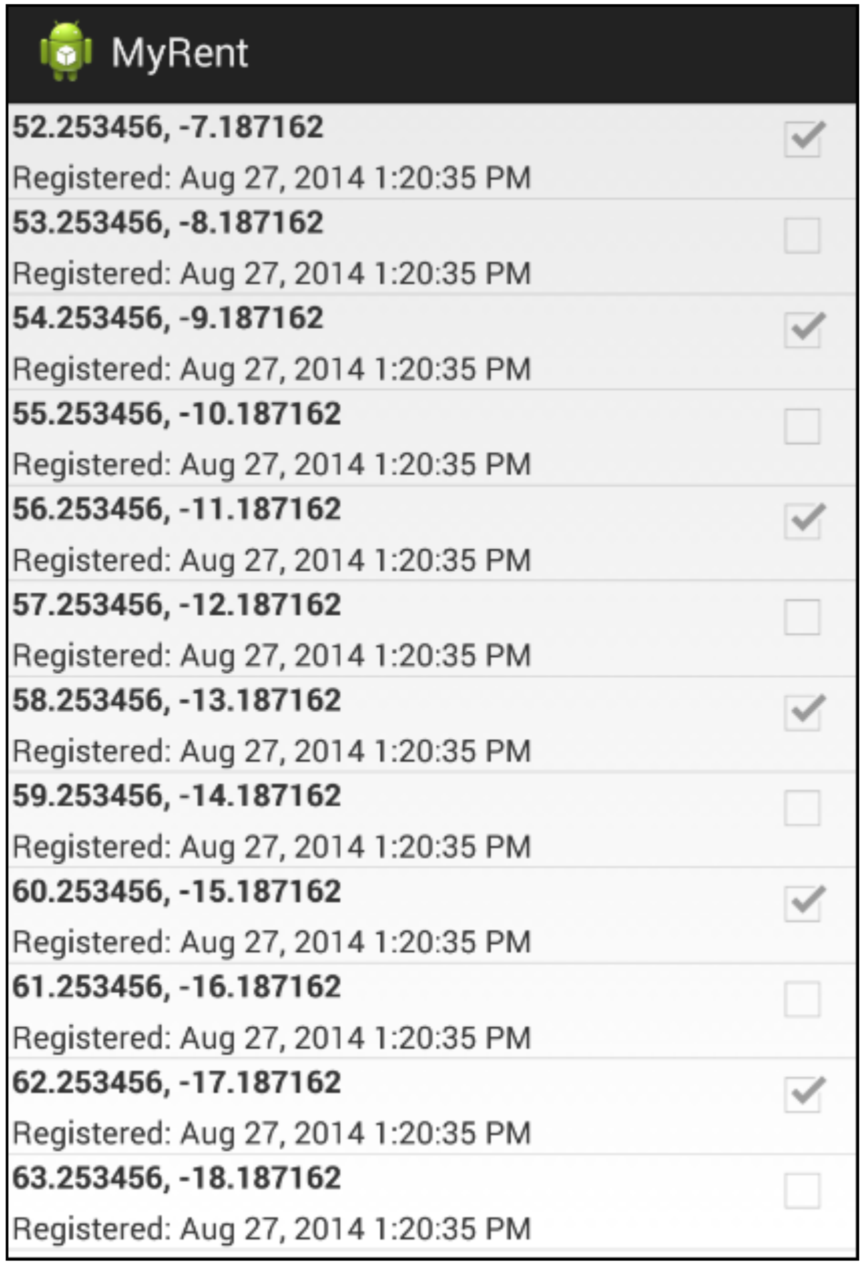
MyRentApp

```
public class MyRentApp extends Application
{
  public Portfolio portfolio;

  @Override
  public void onCreate()
  {
    super.onCreate();
    portfolio = new Portfolio();

    info(this, "RentControl app launched");
  }
}
```

- ‘Singleton’ Application object - only on MyRentApp created.
- Use this to create a single portfolio object for the application

ResidenceListActivity

```java
public class ResidenceListActivity extends Activity implements OnItemClickListener
{
  private ListView listView;
  private Portfolio portfolio;
  private ResidenceAdapter adapter;

  @Override
  public void onCreate(Bundle savedInstanceState)
  {
    super.onCreate(savedInstanceState);
    setTitle(R.string.app_name);
    setContentView(R.layout.activity_residencelist);

    listView = (ListView) findViewById(R.id.residenceList);

    MyRentApp app = (MyRentApp) getApplication();
    portfolio = app.portfolio;

    adapter = new ResidenceAdapter(this, portfolio.residences);
    listView.setAdapter(adapter);
    listView.setOnItemClickListener(this);
  }

  @Override
  public void onItemClick(AdapterView<?> parent, View view, int position, long id)
  {
    Residence residence = adapter.getItem(position);
    Intent intent = new Intent(this, ResidenceActivity.class);
    intent.putExtra("RESIDENCE_ID", residence.id);
    startActivity(intent);
  }

  @Override
  public void onResume()
  {
    super.onResume();
    adapter.notifyDataSetChanged();
  }
}
```



MyRent

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Registered: Aug 27, 2014 1:20:35 PM

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Registered: Aug 27, 2014 1:20:35 PM

63.253456, -18.187162 □
Registered: Aug 27, 2014 1:20:35 PM

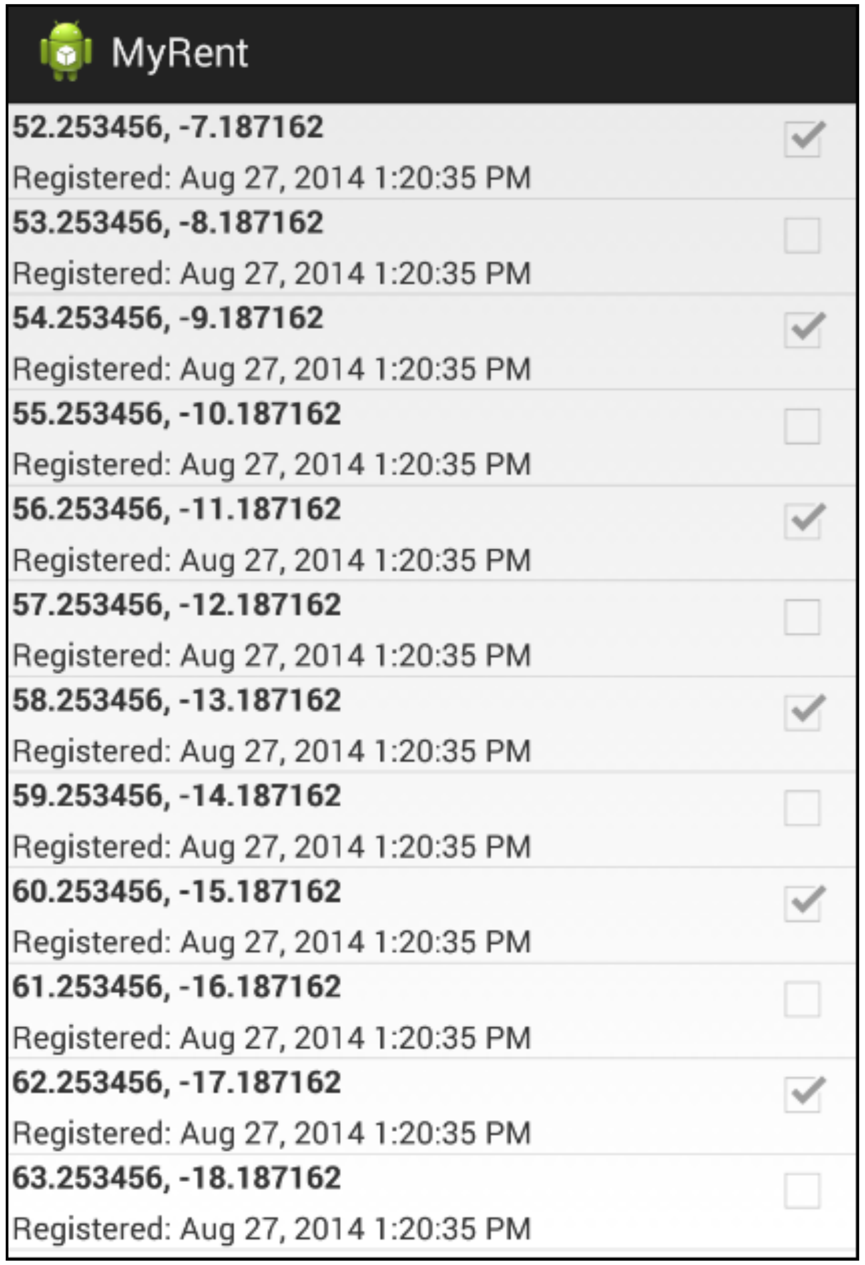
ResidenceListActivity

```
//...
@Override
public void onItemClick(AdapterView<?> parent, View view, int position, long id)
{
  Residence residence = adapter.getItem(position);
  Intent intent = new Intent(this, ResidenceActivity.class);
  intent.putExtra("RESIDENCE_ID", residence.id);
  startActivity(intent);
}
//...
```

- Retrieve the Residence object by its position in the list

- Create a new Intent to start ResidenceActivity class

- Before starting it, put the ID of the object we retrieved into the 'extra' information passed to the intent



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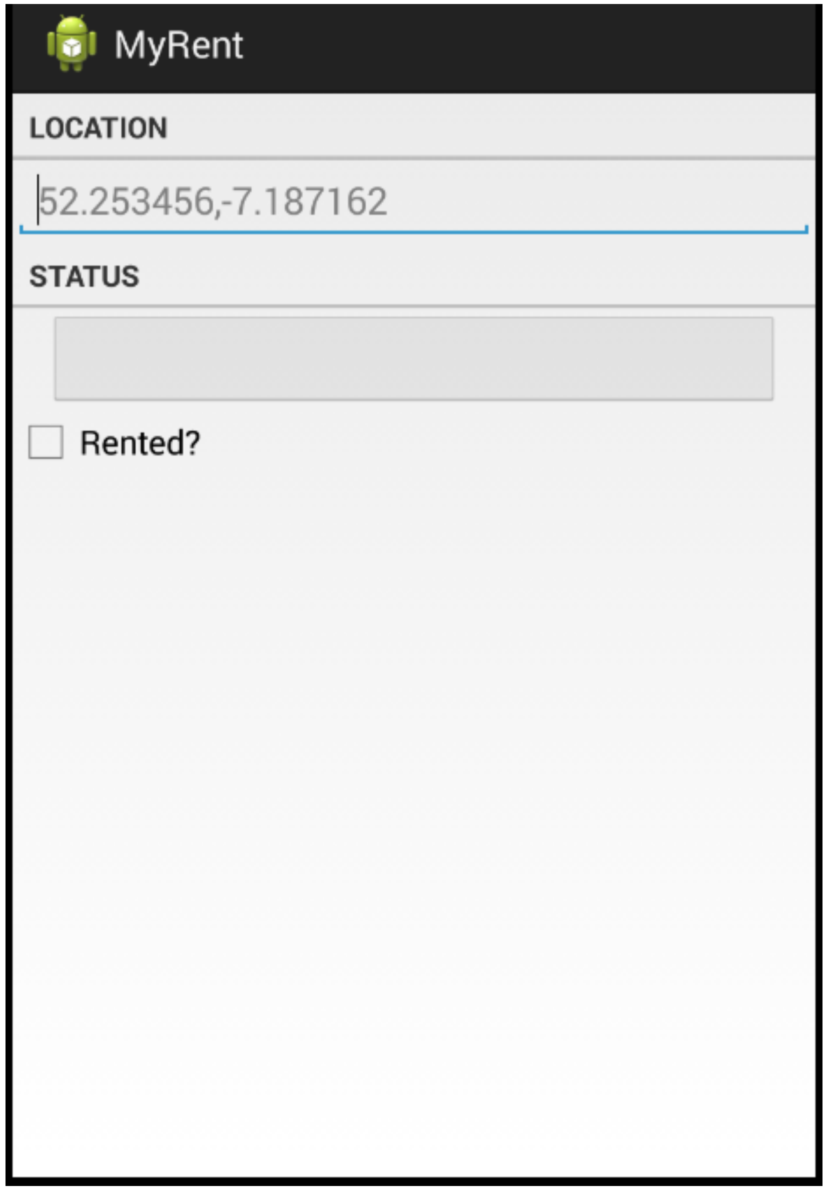
Registered: Aug 27, 2014 1:20:35 PM

63.253456, -18.187162 □
Registered: Aug 27, 2014 1:20:35 PM

ResidenceActivity

```java
public class ResidenceActivity extends Activity implements TextWatcher,
                                                           OnCheckedChangeListener
{
  private EditText geolocation;
  private CheckBox rented;
  private Button   dateButton;

  private Residence residence;
  private Portfolio portfolio;

  @Override
  public void onCreate(Bundle savedInstanceState)
  {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_residence);

    geolocation = (EditText) findViewById(R.id.geolocation);
    dateButton  = (Button)   findViewById(R.id.registration_date);
    rented      = (CheckBox) findViewById(R.id.isrented);

    geolocation.addTextChangedListener(this);
    dateButton .setEnabled(false);
    rented     .setOnCheckedChangeListener(this);

    MyRentApp app = (MyRentApp) getApplication();
    portfolio = app.portfolio;

    UUID resId = (UUID) getIntent().getExtras().getSerializable("RESIDENCE_ID");
    residence = portfolio.getResidence(resId);
    if (residence != null)
    {
      updateControls(residence);
    }
  }

//...
```



MyRent

LOCATION

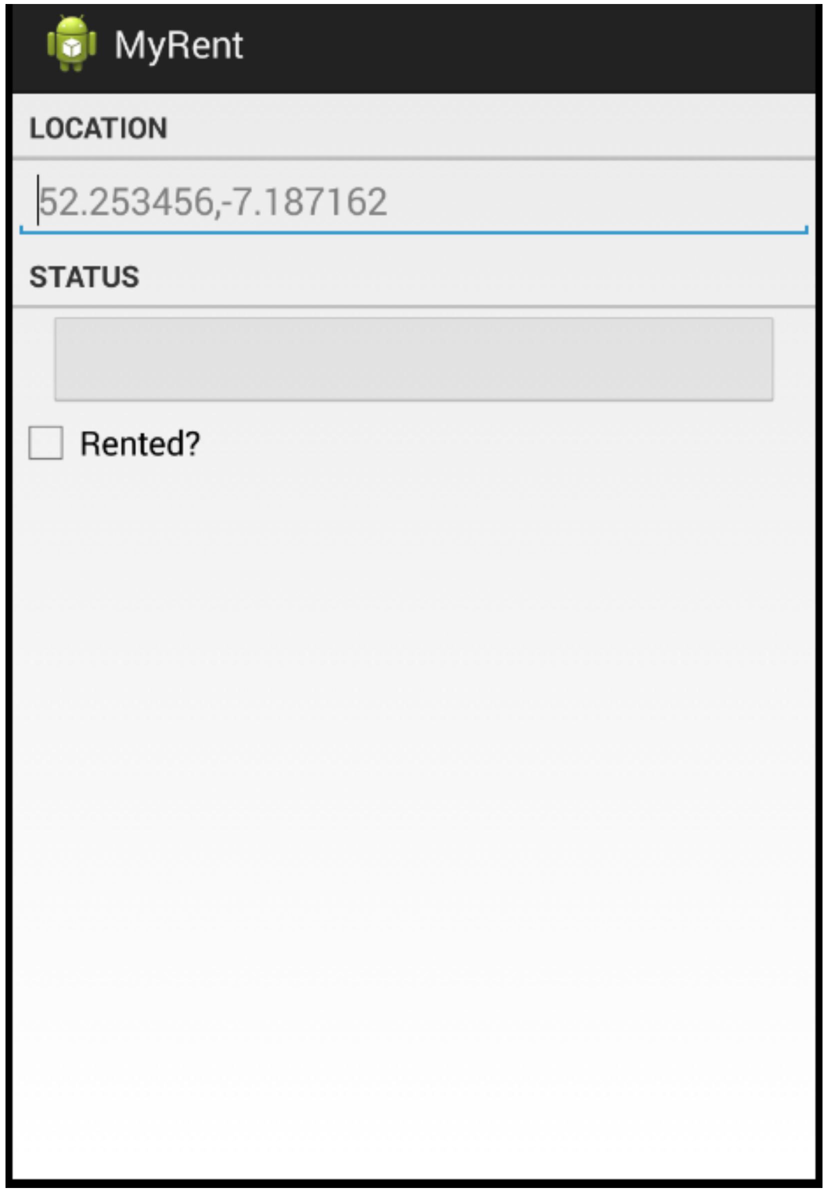
52.253456,-7.187162

STATUS

□ Rented?

ResidenceActivity

```
public class ResidenceActivity extends Activity implements TextWatcher,
                                                           OnCheckedChangeListener
{
  //…
  @Override
  public void onCreate(Bundle savedInstanceState)
  {
    //...
    UUID resId = (UUID) getIntent().getExtras().getSerializable("RESIDENCE_ID");
    residence = portfolio.getResidence(resId);
    if (residence != null)
    {
      updateControls(residence);
    }
  }

  public void updateControls(Residence residence)
  {
    geolocation.setText(residence.geolocation);
    rented.setChecked(residence.rented);
    dateButton.setText(residence.getDateString());
  }

//...
```



52.253456,-7.187162

- Retrieve the ID from the ‘Extra’ information
- Use the ID to recover the actual Residence object from the portfolio
- Send this residence information to the controls

ResidenceActivity - Event Handlers

```
  @Override
  public void onCheckedChanged(CompoundButton arg0, boolean isChecked)
  {
    Log.i(this.getClass().getSimpleName(), "rented Checked");
    residence.rented = isChecked;
  }

  @Override
  public void afterTextChanged(Editable c)
  {
    Log.i(this.getClass().getSimpleName(), "geolocation " + c.toString());
    residence.geolocation = c.toString();
  }

  @Override
  public void beforeTextChanged(CharSequence arg0, int arg1, int arg2, int arg3)
  {
  }

  @Override
  public void onTextChanged(CharSequence arg0, int arg1, int arg2, int arg3)
  {
  }
}
```

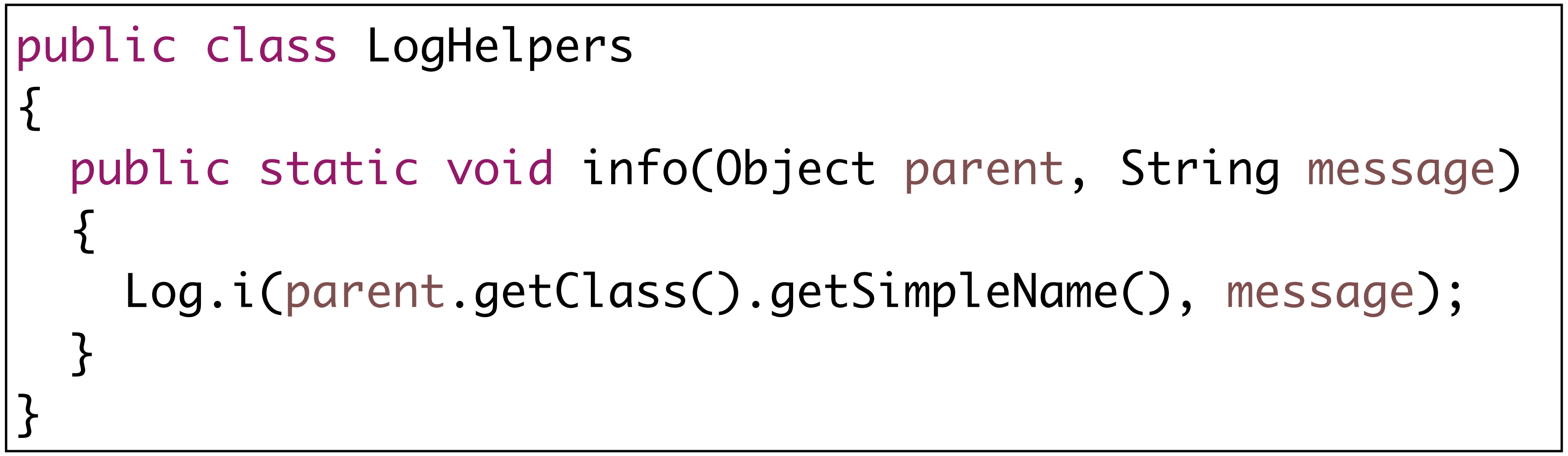
ResidenceAdapter

```
class ResidenceAdapter extends ArrayAdapter<Residence>
{
  private Context context;

  public ResidenceAdapter(Context context, ArrayList<Residence> residences)
  {
    super(context, 0, residences);
    this.context = context;
  }

  @Override
  public View getView(int position, View convertView, ViewGroup parent)
  {
    LayoutInflater inflater = (LayoutInflater) context.getSystemService(Context.LAYOUT_INFLATER_SERVICE);
    if (convertView == null)
    {
      convertView = inflater.inflate(R.layout.list_item_residence, null);
    }
    Residence res = getItem(position);

    TextView geolocation = (TextView) convertView.findViewById(R.id.residence_list_item_geolocation);
    geolocation.setText(res.geolocation);

    TextView dateTextView = (TextView) convertView.findViewById(R.id.residence_list_item_dateTextView);
    dateTextView.setText(res.getDateString());

    CheckBox rentedCheckBox = (CheckBox) convertView.findViewById(R.id.residence_list_item_isrented);
    rentedCheckBox.setChecked(res.rented);

    return convertView;
  }
}
```

LogHelper

- Occasionally introduce helpers to simplify / encapsulate awkward looking code.

- Helpers should usually be static - and should aim to make the clients of the helper easier to read



```java
public class LogHelpers
{
  public static void info(Object parent, String message)
  {
    Log.i(parent.getClass().getSimpleName(), message);
  }
}
```

AndroidManifest

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

  <application
      android:name=".app.MyRentApp"
      android:allowBackup="true"
      android:icon="@mipmap/ic_launcher"
      android:label="@string/app_name"
      android:theme="@style/AppTheme">

    <activity
        android:name=".activities.ResidenceListActivity"
        android:label="@string/app_name" >
      <intent-filter>
        <action android:name="android.intent.action.MAIN" />
        <category android:name="android.intent.category.LAUNCHER" />
      </intent-filter>
    </activity>

    <activity
        android:name=".activities.ResidenceActivity"
        android:label="@string/app_name">
    </activity>
  </application>

</manifest>
```

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