Mobile Application Development

Higher Diploma in Science in Computer Science

Produced by

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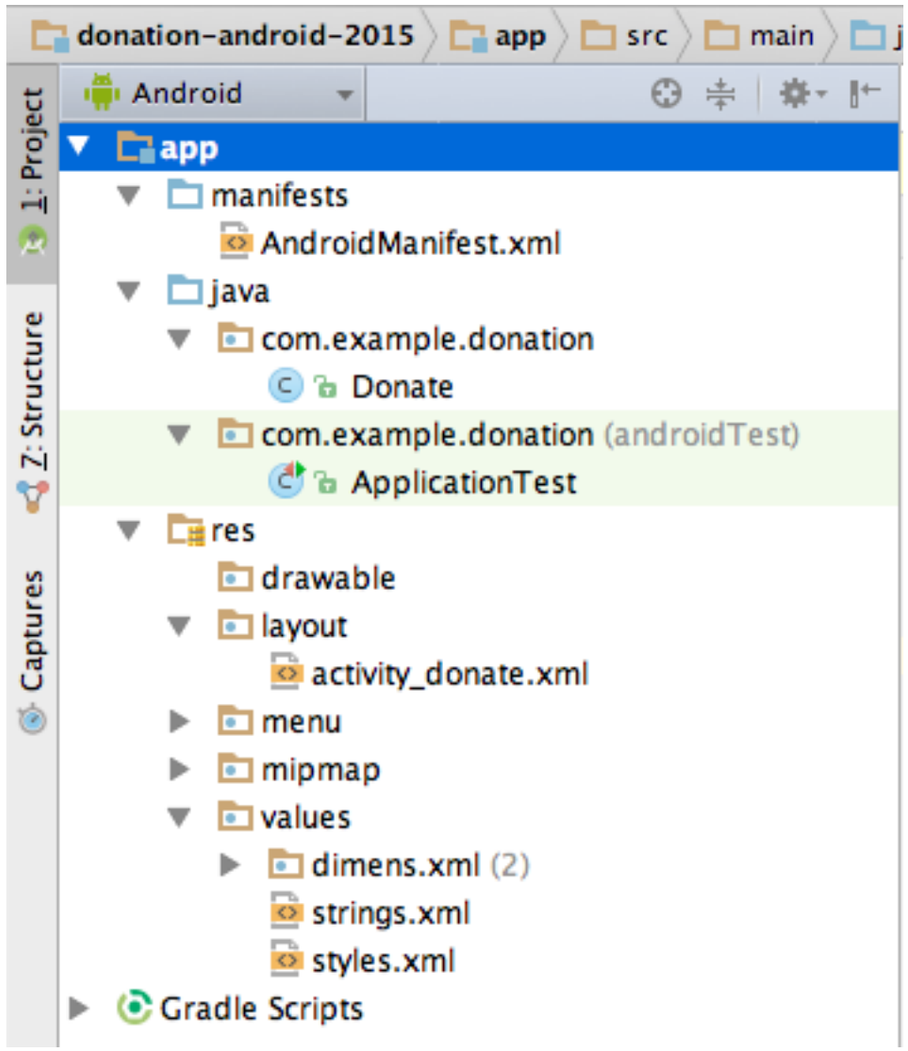
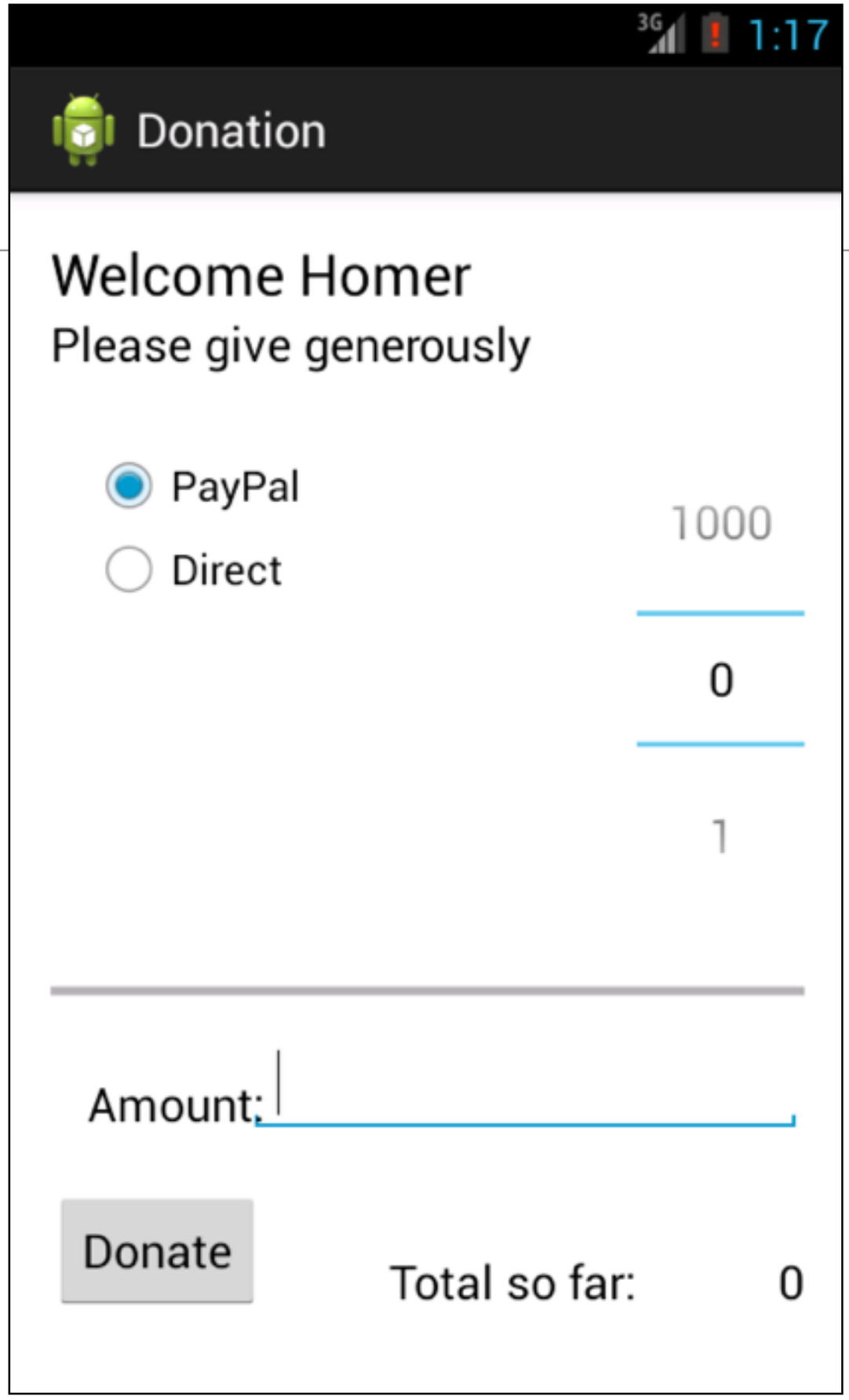
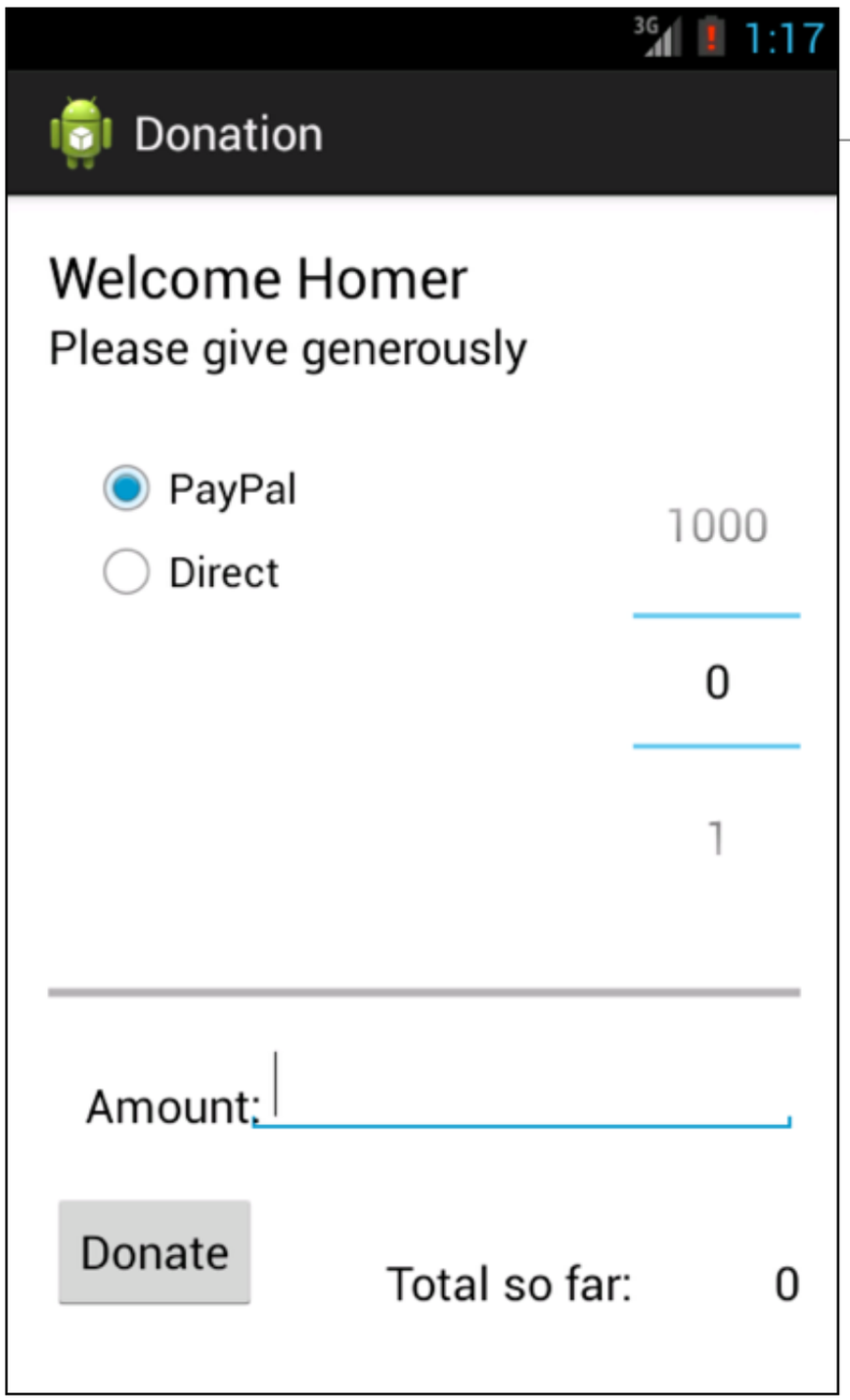
eLearning support unit

donation-android case study - v2

donation v1


donation-android-2015
app
src
main
Android
1: Project
Z: Structure
Captures
app
manifests
AndroidManifest.xml
java
com.example.donation
Donate
com.example.donation (androidTest)
ApplicationTest
res
drawable
layout
activity_donate.xml
menu
mipmap
values
dimens.xml (2)
strings.xml
styles.xml
Gradle Scripts


3G
1:17
Donation
Welcome Homer
Please give generously
PayPal
Direct
1000
0
1
Amount:
Donate
Total so far:
0



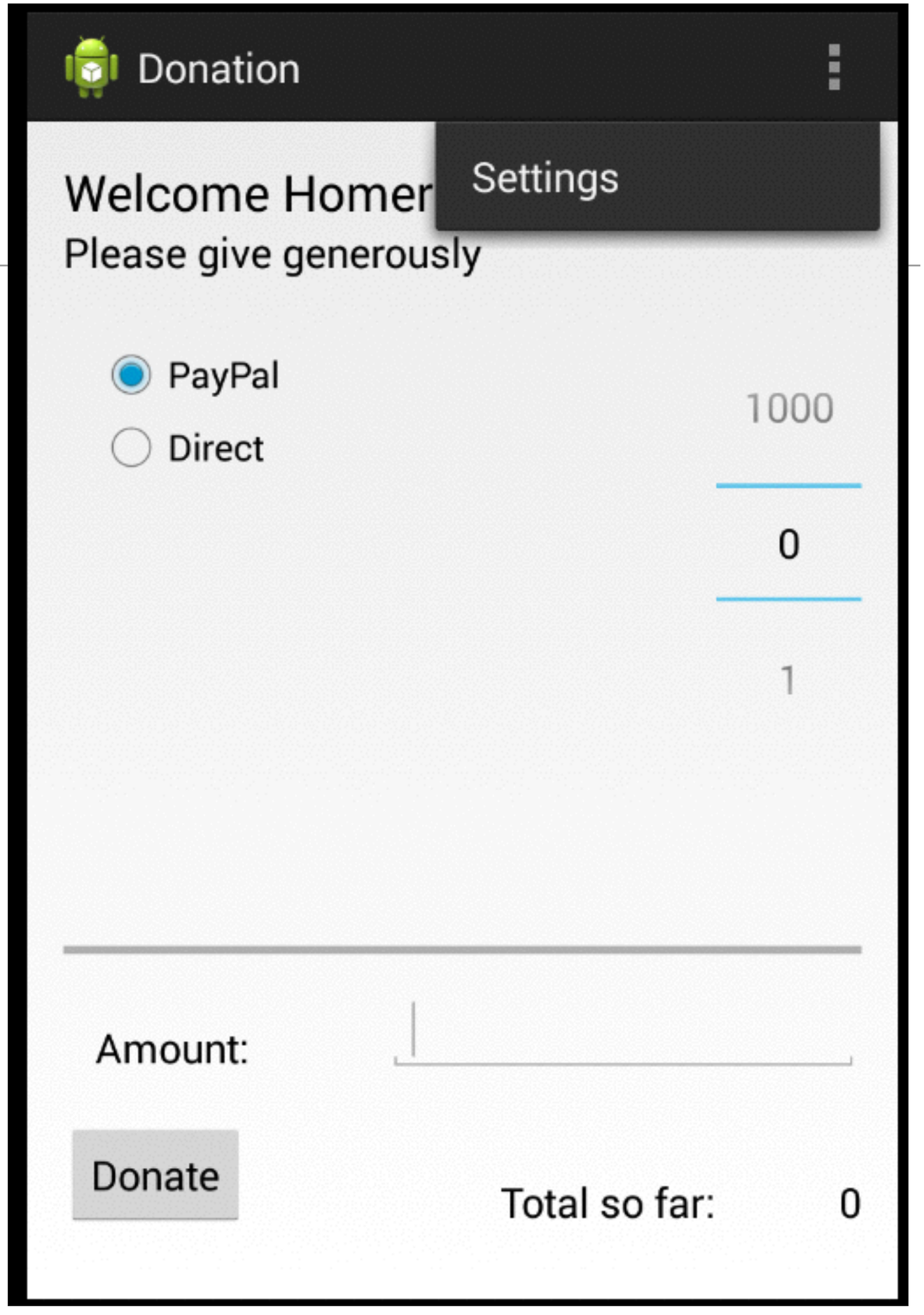

```
public class Donate extends Activity
{
  private int          totalDonated = 0;
  private int          target = 10000;

  private RadioGroup   paymentMethod;
  private ProgressBar  progressBar;
  private NumberPicker amountPicker;
  private TextView     amountText;
  private TextView     amountTotal;

  @Override
  protected void onCreate(Bundle savedInstanceState)
  {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_donate);

    paymentMethod = (RadioGroup)   findViewById(R.id.paymentMethod);
    progressBar   = (ProgressBar)  findViewById(R.id.progressBar);
    amountPicker  = (NumberPicker) findViewById(R.id.amountPicker);
    amountText    = (TextView)     findViewById(R.id.amountText);
    amountTotal   = (TextView)     findViewById(R.id.amountTotal);

    amountPicker.setMinValue(0);
    amountPicker.setMaxValue(1000);
    progressBar.setMax(target);
  }

  @Override
  public boolean onCreateOptionsMenu(Menu menu)
  {
    getMenuInflater().inflate(R.menu.donate, menu);
    return true;
  }
```

donate button event handler

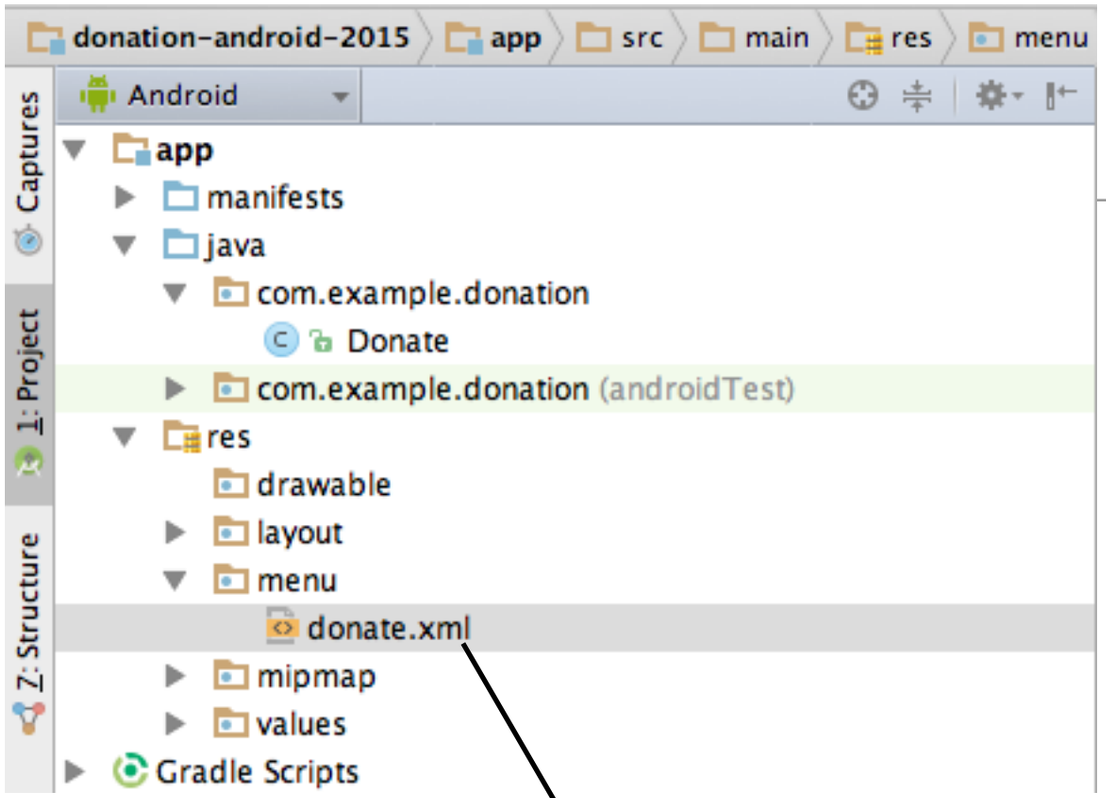
```
public void donateButtonPressed (View view)
{
  String method = paymentMethod.getCheckedRadioButtonId() == R.id.PayPal ? "PayPal" : "Direct";
  int donatedAmount =  amountPicker.getValue();
  if (donatedAmount == 0)
  {
    String text = amountText.getText().toString();
    if (!text.equals(""))
      donatedAmount = Integer.parseInt(text);
  }

  if (totalDonated > target)
  {
    Toast toast = Toast.makeText(this, "Target Exceeded!", Toast.LENGTH_SHORT);
    toast.show();
    Log.v("Donate","Target Exceeded: " + totalDonated);
  }
  else
  {
    totalDonated  = totalDonated + donatedAmount;
    progressBar.setProgress(totalDonated);
    Log.v("Donate", amountPicker.getValue() + " donated by " +  method + "\nCurrent total " + totalDonated);
  }
  String totalDonatedStr = "$" + totalDonated;
  amountTotal.setText(totalDonatedStr);
}
```

Menus

- Pressing the ‘overflow’ icon on the action bar brings up a menu with single entry:



Menu Load



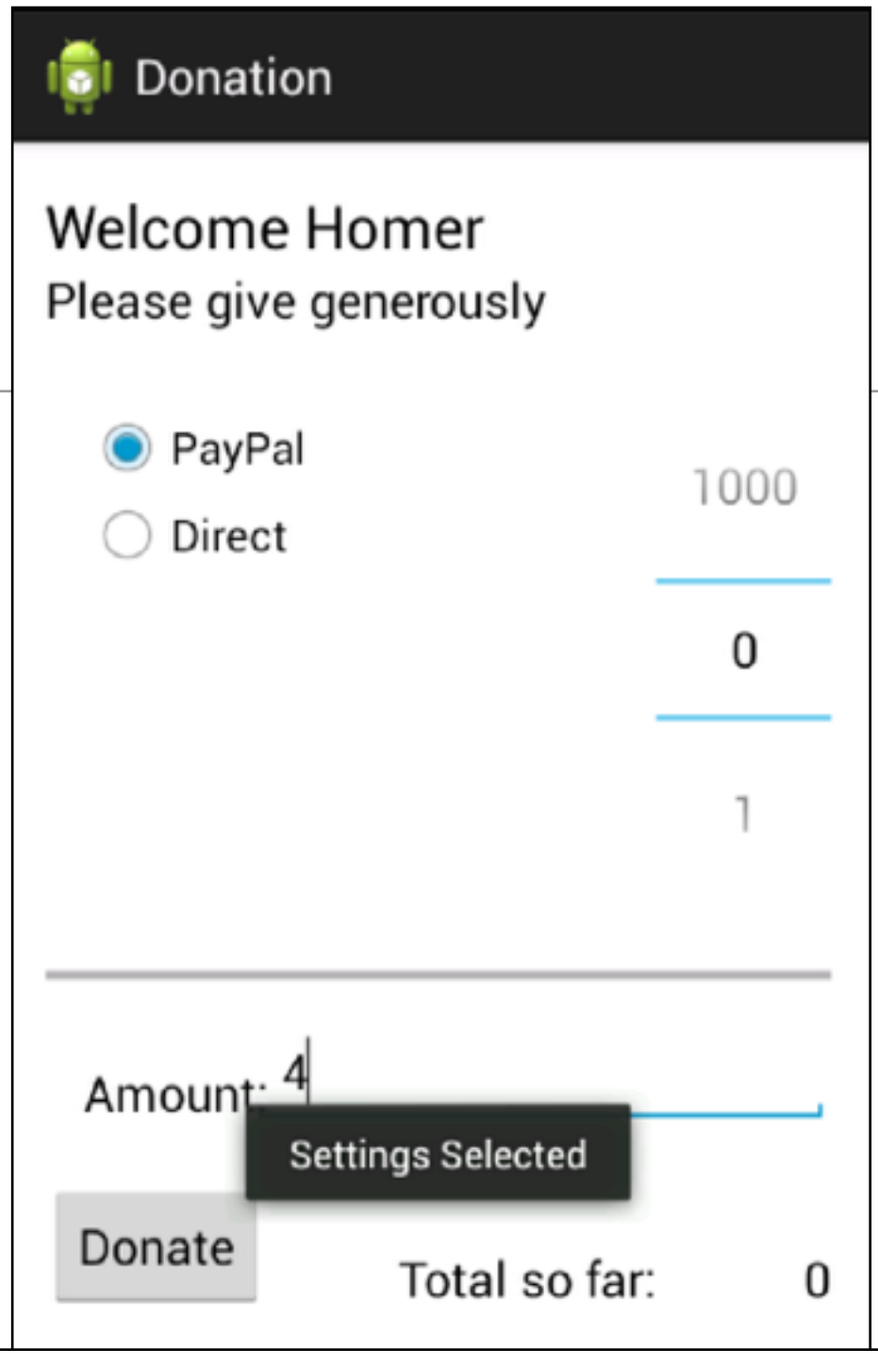

```
public class Donate extends Activity
{
  //...

  @Override
  public boolean onCreateOptionsMenu(Menu menu)
  {
    getMenuInflater().inflate(R.menu.donate, menu);
    return true;
  }

  //...
}
```

Menu Specification

```
<menu xmlns:android="http://schemas.android.com/apk/res/android" >

    <item
        android:id="@+id/action_settings"
        android:orderInCategory="100"
        android:showAsAction="never"
        android:title="@string/action_settings"/>

</menu>
```

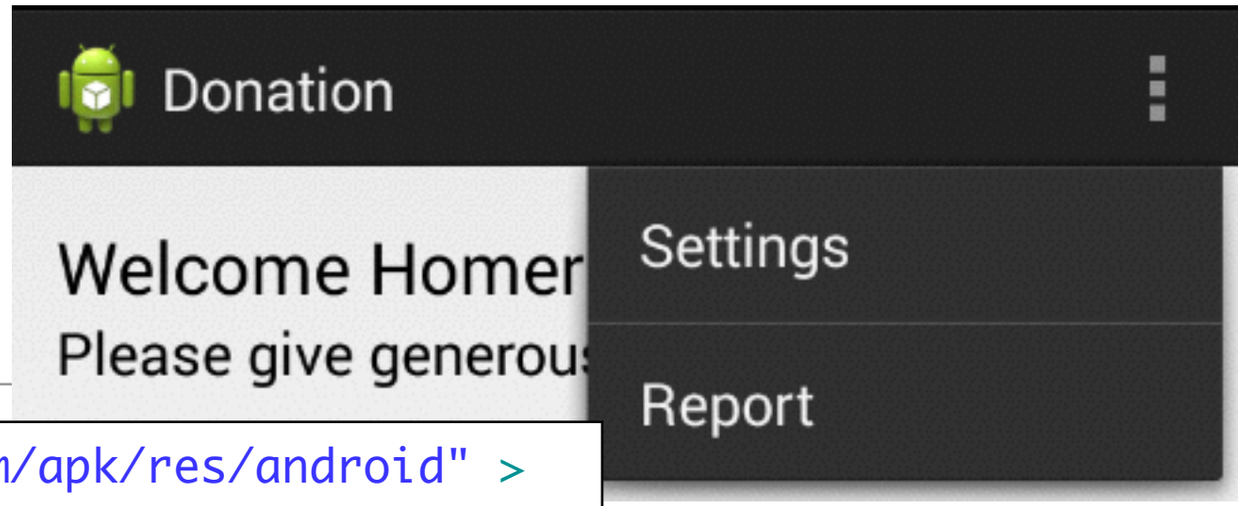
Menu Event Handler

- Display ‘Toast’ for a few seconds




```
@Override
public boolean onOptionsItemSelected(MenuItem item)
{
  switch (item.getItemId())
  {
    case R.id.action_settings: Toast toast = Toast.makeText(this, "Settings Selected", Toast.LENGTH_SHORT);
                               toast.show();
                               break;
  }
  return true;
}
```

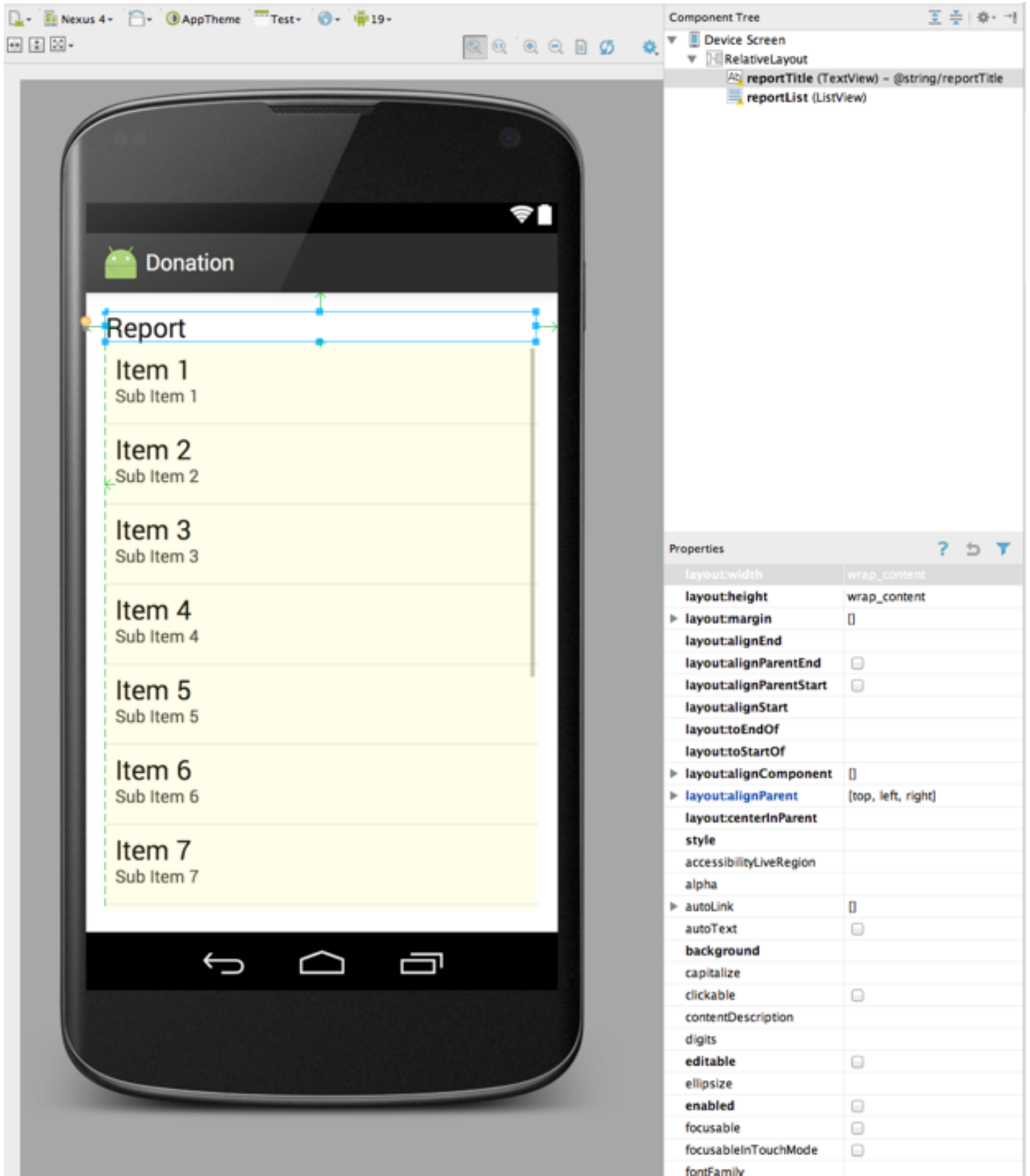
New Menu Item




```
<menu xmlns:android="http://schemas.android.com/apk/res/android" >

    <item
        android:id="@+id/action_settings"
        android:orderInCategory="100"
        android:showAsAction="never"
        android:title="@string/menuSettings"/>

    <item
        android:id="@+id/menuReport"
        android:orderInCategory="100"
        android:showAsAction="never"
        android:title="@string/menuReport"/>

</menu>
```

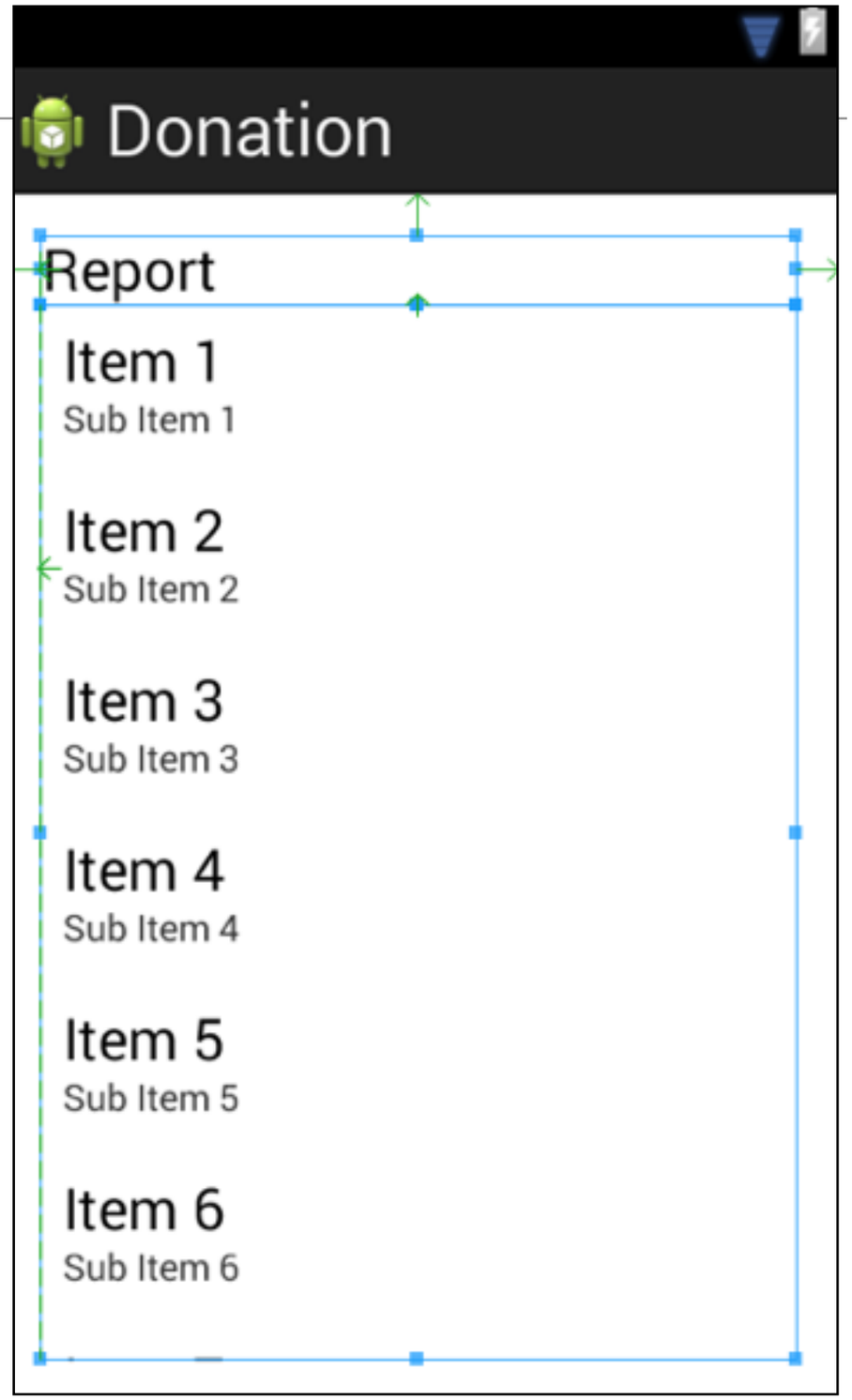
```
    <string name="menuReport">Report</string>
```

Design new Report activity

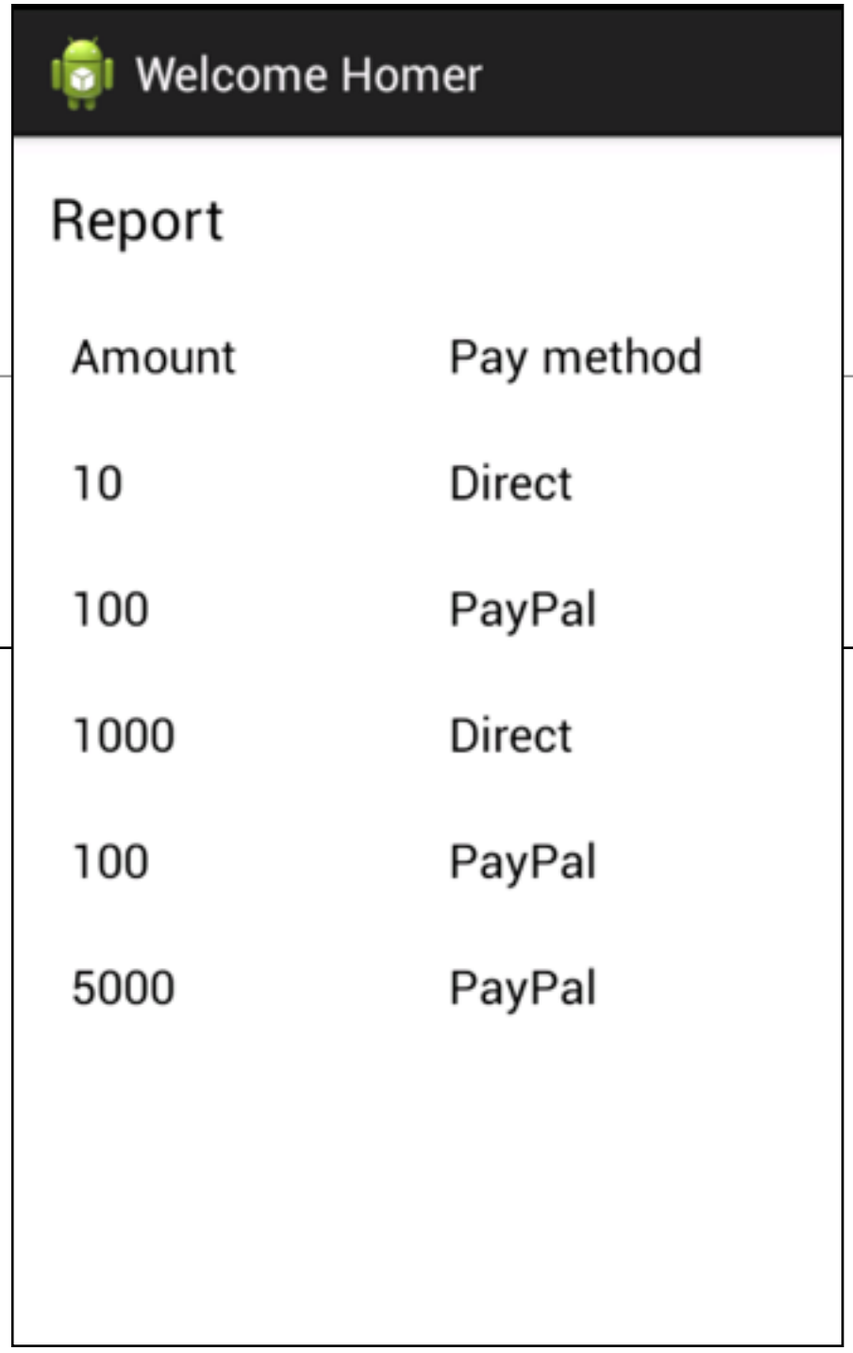


activity_report.xml

```
<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"
    android:paddingBottom="@dimen/activity_vertical_margin"
    android:paddingLeft="@dimen/activity_horizontal_margin"
    android:paddingRight="@dimen/activity_horizontal_margin"
    android:paddingTop="@dimen/activity_vertical_margin"
    tools:context=".Test" >

    <TextView
        android:id="@+id/reportTitle"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentLeft="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentTop="true"
        android:text="@string/reportTitle"
        android:textAppearance="?android:attr/textAppearanceLarge" />

    <ListView
        android:id="@+id/reportList"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_alignLeft="@+id/reportTitle"
        android:layout_below="@+id/reportTitle" >

    </ListView>

</RelativeLayout>
```

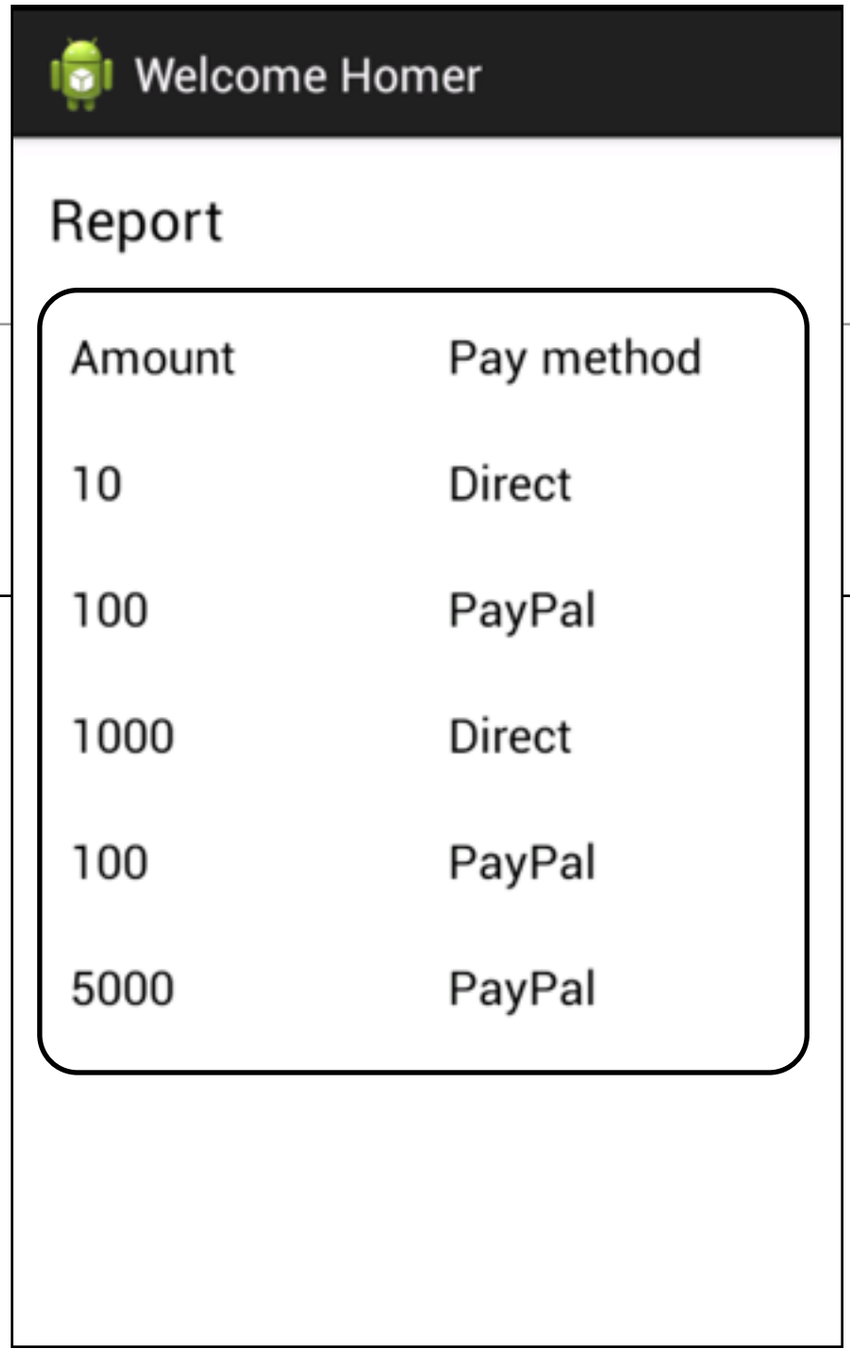


ActivityReport




```
public class Report extends Activity
{
  ListView listView;

  static final String[] numbers = new String[] {
      "Amount, Pay method",
      "10,     Direct",
      "100,    PayPal",
      "1000,   Direct",
      "10,     PayPal",
      "5000,   PayPal"};

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

    listView = (ListView) findViewById(R.id.reportList);
    ArrayAdapter<String> adapter = new ArrayAdapter<String>(this,  android.R.layout.simple_list_item_1, numbers);

    listView.setAdapter(adapter);
  }
}
```

ActivityReport



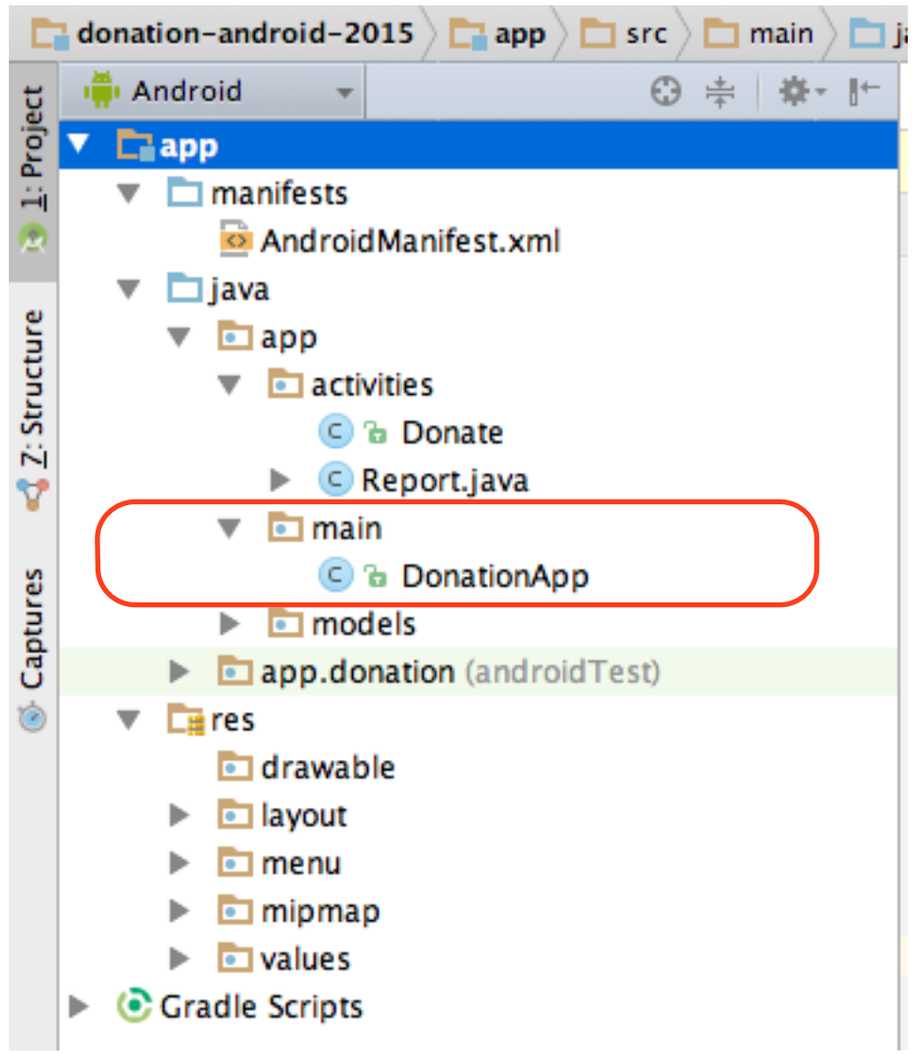

```
public class Report extends Activity
{
  ListView listView;

  static final String[] numbers = new String[] {
      "Amount, Pay method",
      "10,     Direct",
      "100,    PayPal",
      "1000,   Direct",
      "10,     PayPal",
      "5000,   PayPal"};

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

    listView = (ListView) findViewById(R.id.reportList);
    ArrayAdapter<String> adapter = new ArrayAdapter<String>(this, android.R.layout.simple_list_item_1, numbers);

    listView.setAdapter(adapter);
  }
}
```

Application Object

AndroidManifest.xml

```
<application
    android:allowBackup="true"
    android:icon="@drawable/ic_launcher"
    android:label="@string/app_name"
    android:theme="@style/AppTheme"
    android:name="app.main.DonationApp">
```

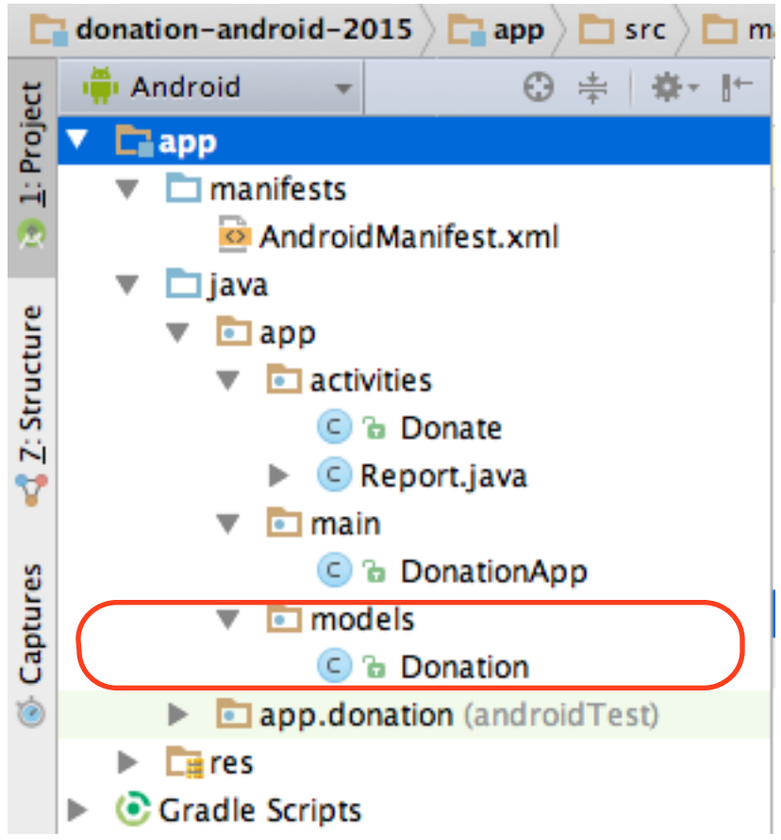
```
package app.main;

import android.app.Application;
import android.util.Log;

public class DonationApp extends Application
{
  @Override
  public void onCreate()
  {
    super.onCreate();
    Log.v("Donation", "Donation App Started");
  }
}
```



- Activities come and go based on user interaction
- Application objects can be a useful ‘anchor’ for an android app
- Use it to hold information shared by all activities

Model Package

- Introduce a ‘models’ package - similar to play framework models package
- Model key application domain - candidates for objects to be stored in a database:
  - locally (sql_lite)
  - remove (via API)




```
public class Donation
{
  public int    amount;
  public String method;

  public Donation (int amount, String method)
  {
    this.amount = amount;
    this.method = method;
  }
}
```

Revised DonationApp

```
public class DonationApp extends Application
{
  public final int       target       = 10000;
  public int             totalDonated = 0;
  public List <Donation> donations    = new ArrayList<Donation>();

  public boolean newDonation(Donation donation)
  {
    boolean targetAchieved = totalDonated > target;
    if (!targetAchieved)
    {
      donations.add(donation);
      totalDonated += donation.amount;
    }
    else
    {
      Toast toast = Toast.makeText(this, "Target Exceeded!", Toast.LENGTH_SHORT);
      toast.show();
    }
    return targetAchieved;
  }

  @Override
  public void onCreate()
  {
    super.onCreate();
    Log.v("Donation", "Donation App Started");
  }
}
```

- Maintain list of donations
- Main current total
- Allow donations to me made (via ‘newDonation’)
- Track if total exceeded or not

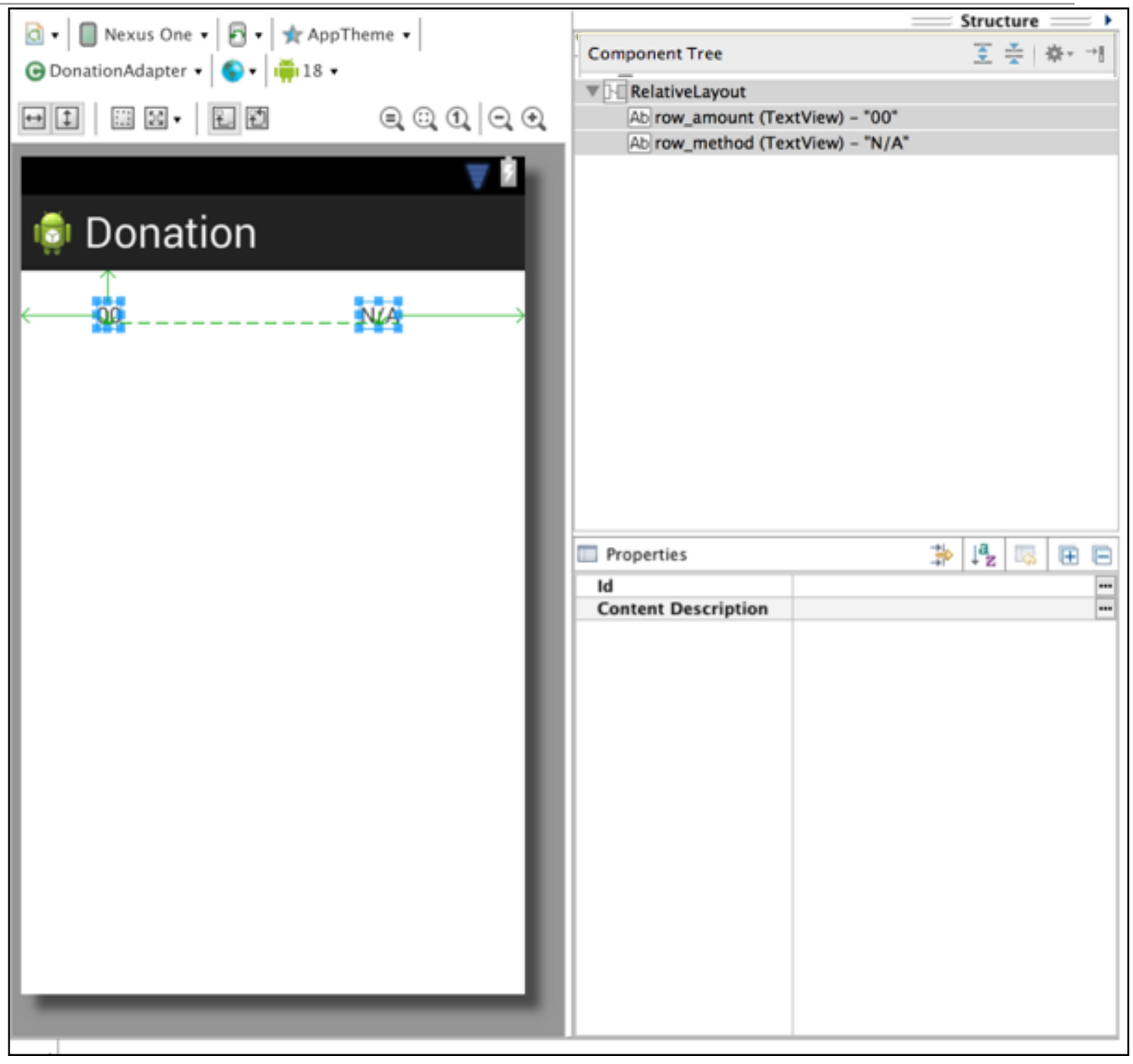
Donate Activity

```
public class Donate extends Activity
{
  //...

  public void donateButtonPressed (View view)
  {
    String method = paymentMethod.getCheckedRadioButtonId() == R.id.PayPal ? "PayPal" : "Direct";
    int donatedAmount =  amountPicker.getValue();
    if (donatedAmount == 0)
    {
      String text = amountText.getText().toString();
      if (!text.equals(""))
        donatedAmount = Integer.parseInt(text);
    }
    if (donatedAmount > 0)
    {
      app.newDonation(new Donation(donatedAmount, method));
      progressBar.setProgress(app.totalDonated);
      String totalDonatedStr = "$" + app.totalDonated;
      amountTotal.setText(totalDonatedStr);
    }
    amountText.setText("");
    amountPicker.setValue(0);
   }
  //..
}
```

- Use the Application Object to store donations

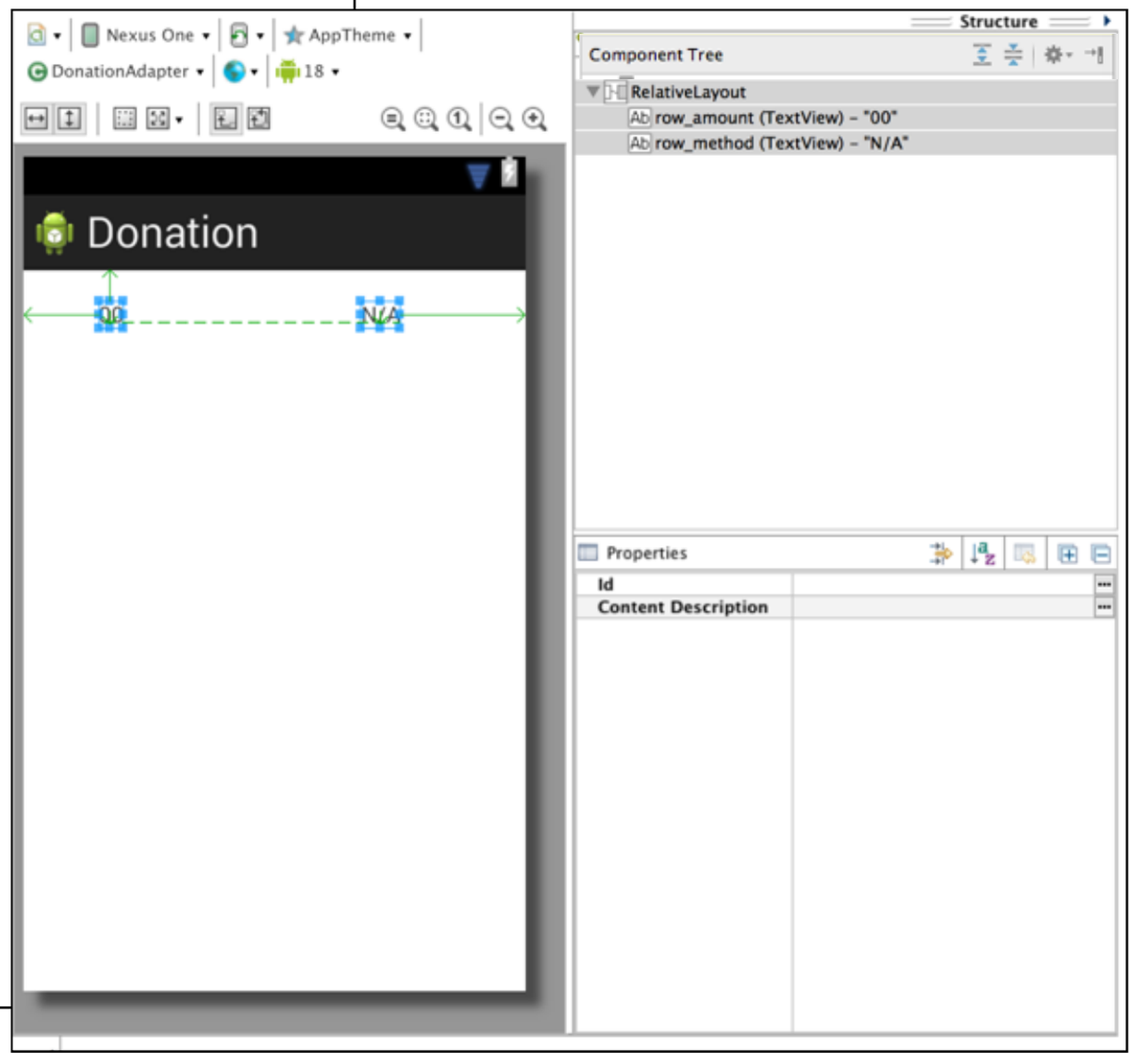
row_donate.xml

- Not all layouts need to be full screen activities
- A layout xml file is just a description of a set of UI elements.
- It can be a full activity, or loaded as a part of some other activity



row_donate.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent" >

    <TextView
        android:id="@+id/row_amount"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentLeft="true"
        android:layout_alignParentTop="true"
        android:layout_marginLeft="48dp"
        android:layout_marginTop="20dp"
        android:text="@string/defaultAmount" />

    <TextView
        android:id="@+id/row_method"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignBaseline="@+id/row_amount"
        android:layout_alignBottom="@+id/row_amount"
        android:layout_alignParentRight="true"
        android:layout_marginRight="79dp"
        android:text="@string/defaultMethod" />

</RelativeLayout>
```



Revised Report Activity

```
public class Report extends Activity
{
  private ListView    listView;
  private DonationApp app;

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

    app = (DonationApp) getApplication();

    listView = (ListView) findViewById(R.id.reportList);
    DonationAdapter adapter = new DonationAdapter (this, app.donations);
    listView.setAdapter(adapter);
  }
}
```

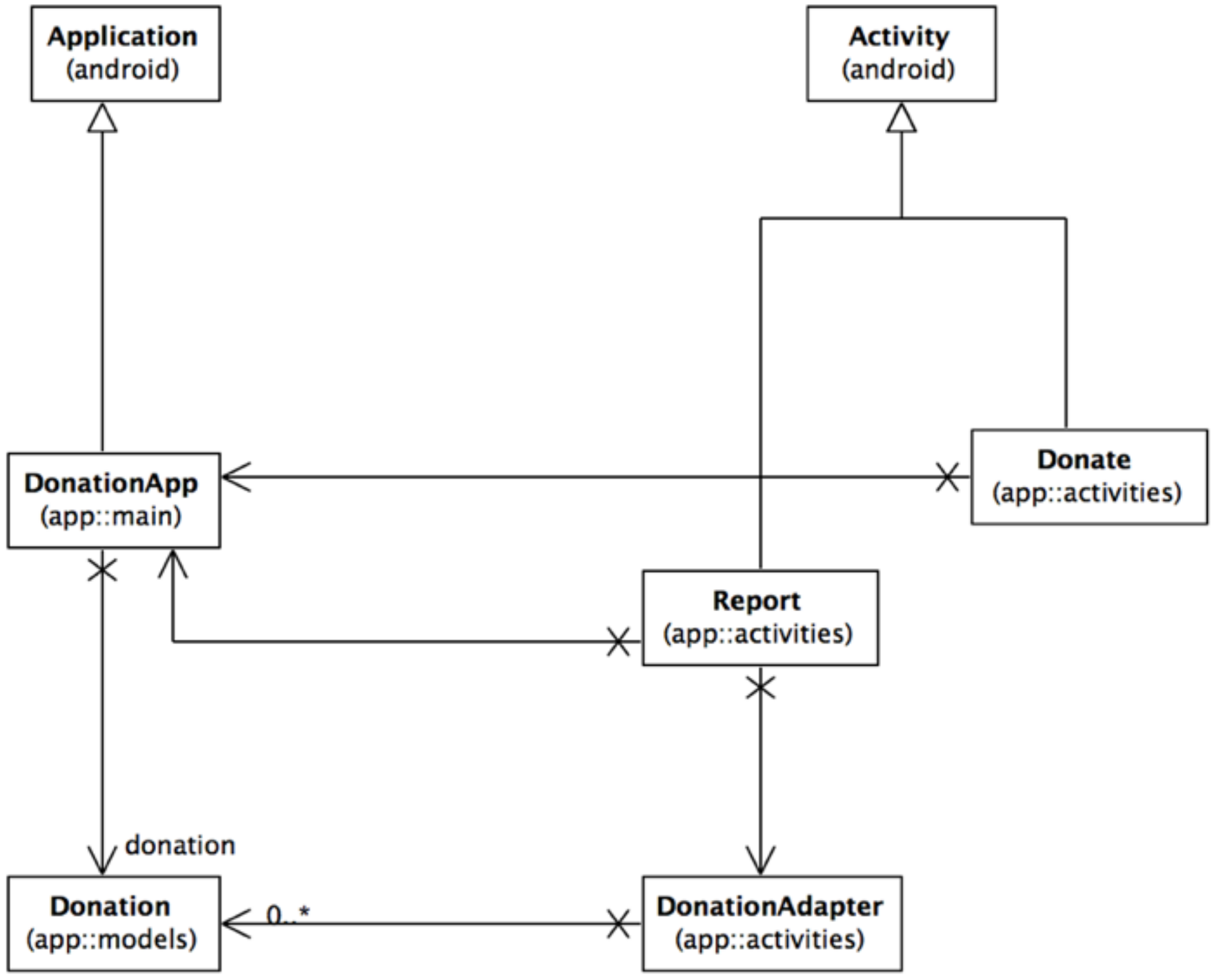
- Remove hard coded list of donations
- Fetch current donations list from Application Object
- Pass this list to a ‘DonationAdapter’ - and give the adapter to the list view.

DonationAdapter

- ‘Adapt’ a list of Donation objects for display in a ListView
- Report the size of the list when asked (getCount())
- Given a specific position - create a ‘View’ representing a row when asked
- This row is created using the row_donate.xml layout we have just designed.

```
class DonationAdapter extends ArrayAdapter<Donation>
{
  private Context        context;
  public  List<Donation> donations;

  public DonationAdapter(Context context, List<Donation> donations)
  {
    super(context, R.layout.row_donate, donations);
    this.context   = context;
    this.donations = donations;
  }

  @Override
  public View getView(int position, View convertView, ViewGroup parent)
  {
    LayoutInflater inflater
     = (LayoutInflater) context.getSystemService(Context.LAYOUT_INFLATER_SERVICE);

    View     view       = inflater.inflate(R.layout.row_donate, parent, false);
    Donation donation   = donations.get(position);
    TextView amountView = (TextView) view.findViewById(R.id.row_amount);
    TextView methodView = (TextView) view.findViewById(R.id.row_method);

    amountView.setText("" + donation.amount);
    methodView.setText(donation.method);

    return view;
  }

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

Donation v2 UML Model

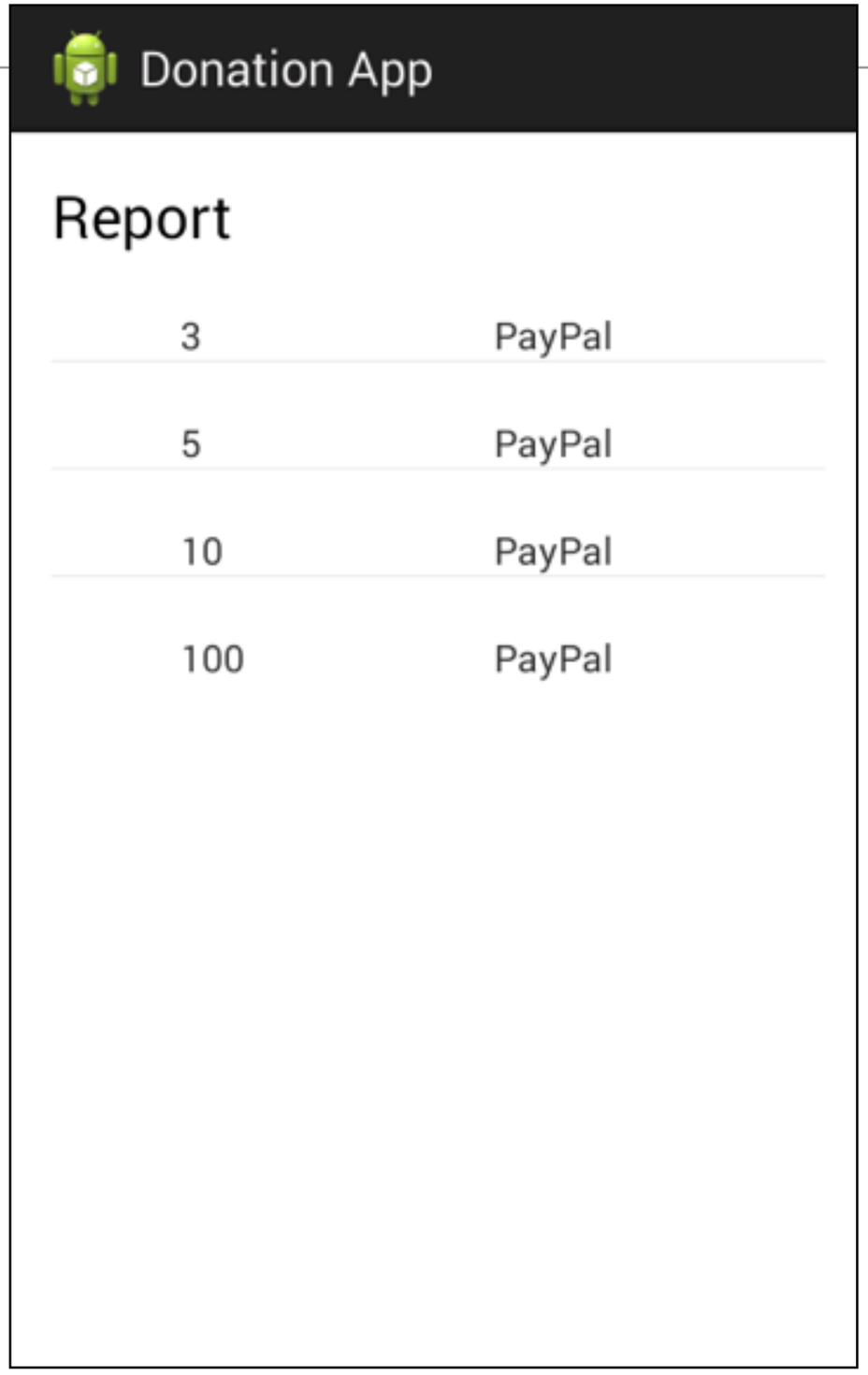


Challenges

Exercises 1

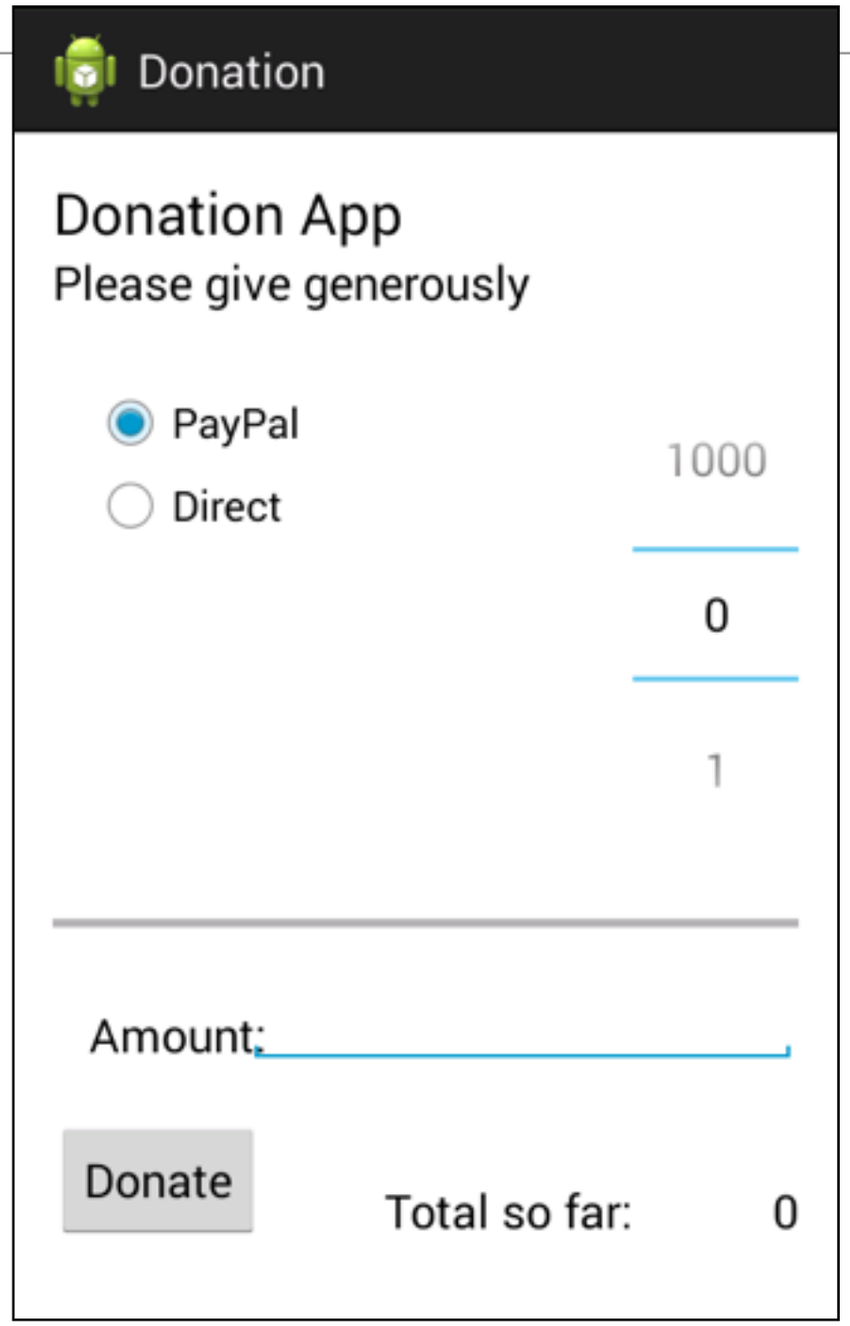
- Run the app and insert amounts of varying lengths (1, 222, 23, 2323). Note that the second column - payment method -may be displayed at different positions. If this happens, fix it.

- Hint: each row is laid out by a row_donate.xml layout. The easiest way to fix this would be to experiment with they layout, and have the text fields aligned with the edges and not with eachother.



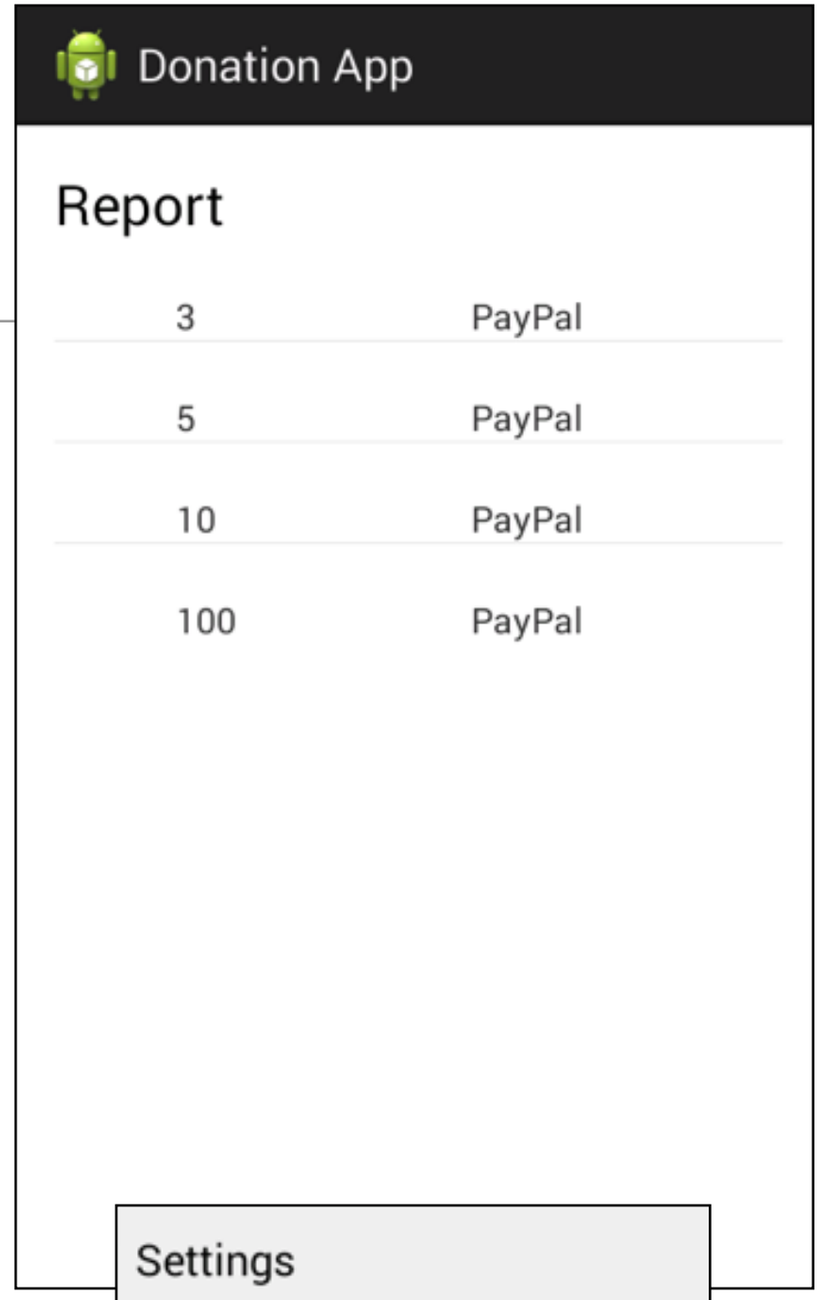
Exercise 2

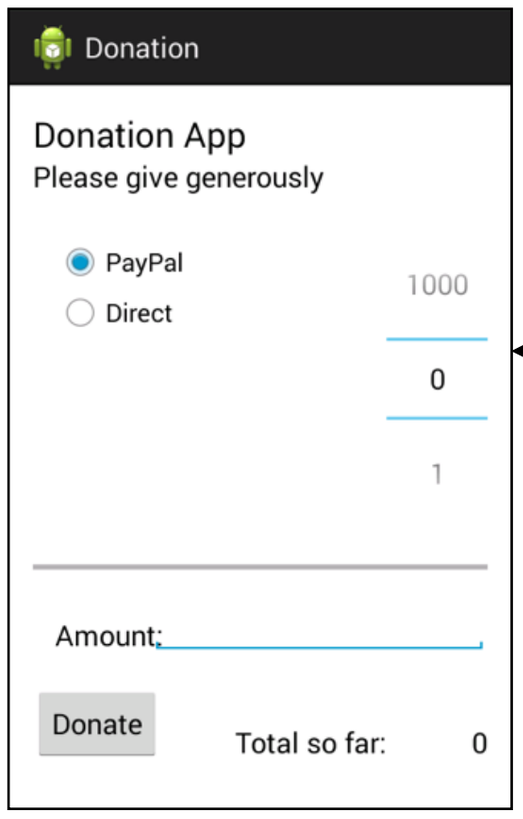
- When a donation is accepted, set the amount on screen to 0 (in both picker and text field).



Exercise 3

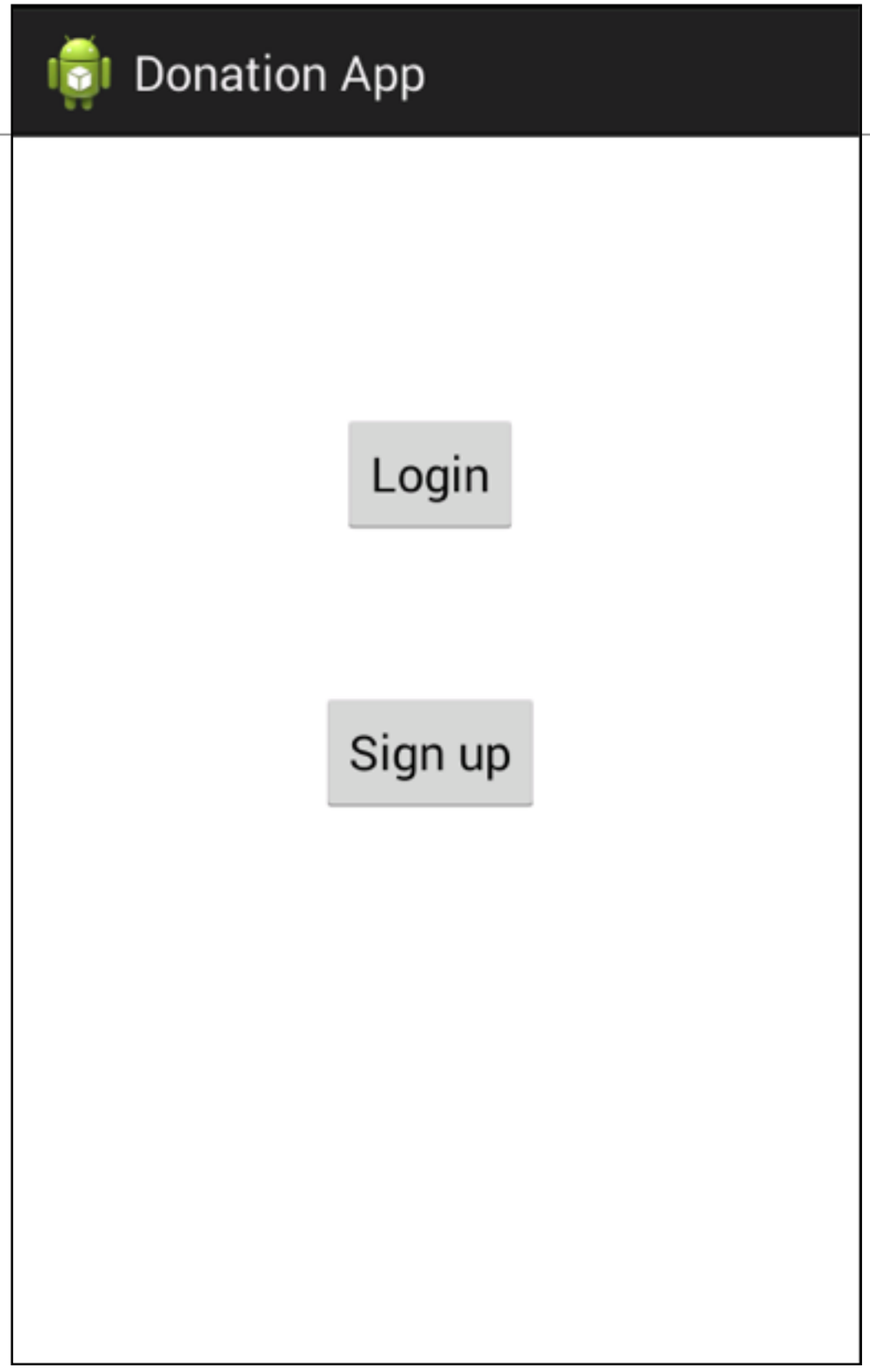
- When you navigate from the Donate activity to reports, there will be no menu available. Bring in a menu, with two options 'Settings' and 'Donate' - Donate should bring you back to the donate screen.





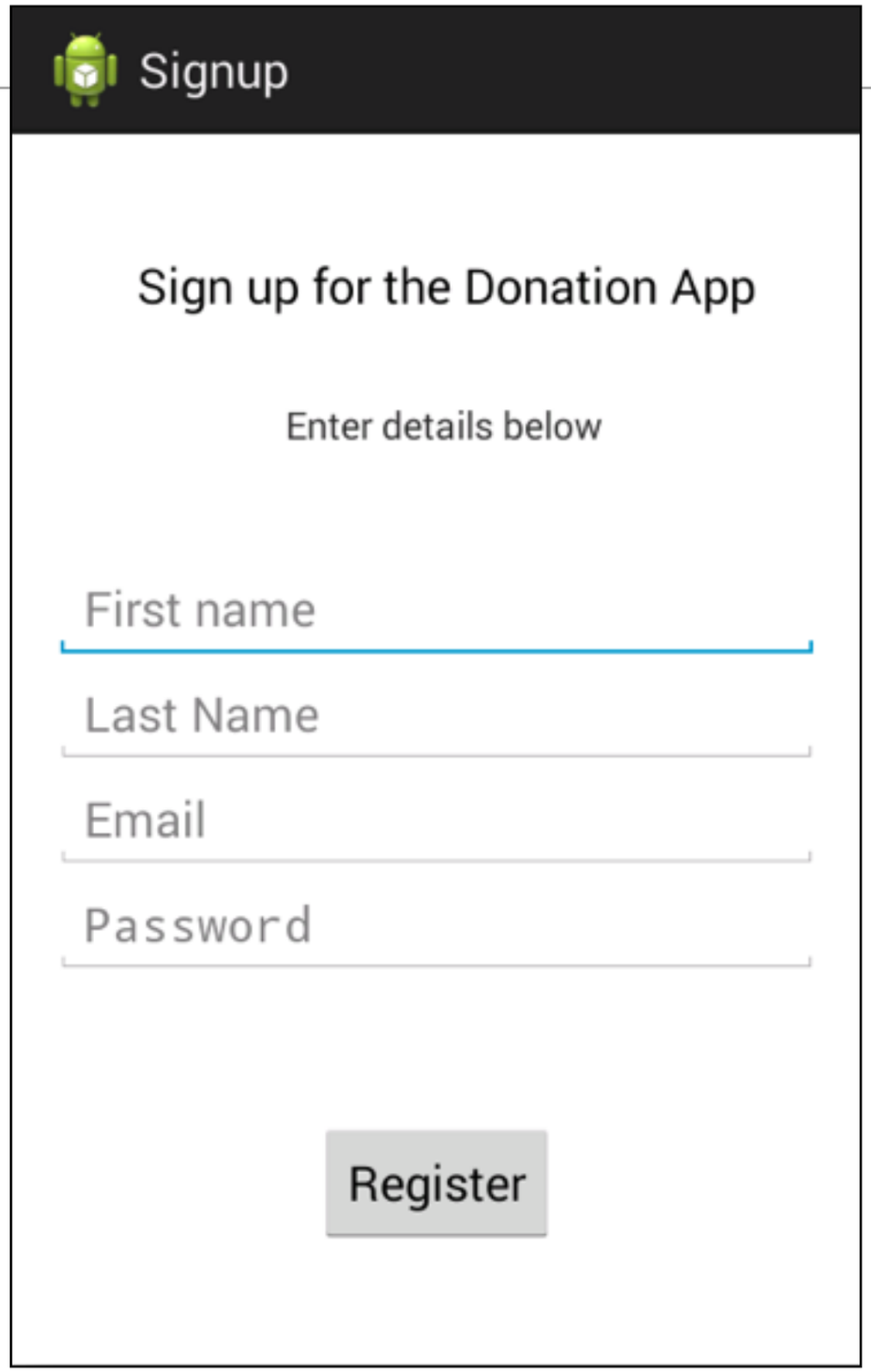
Exercise 4

- Introduce a new welcome screen - which should display a greeting + give the user 2 options (as simple buttons)
  - Signup
  - Login
- When Login is pressed, the app should take you directly to the Donate activity (for the moment).



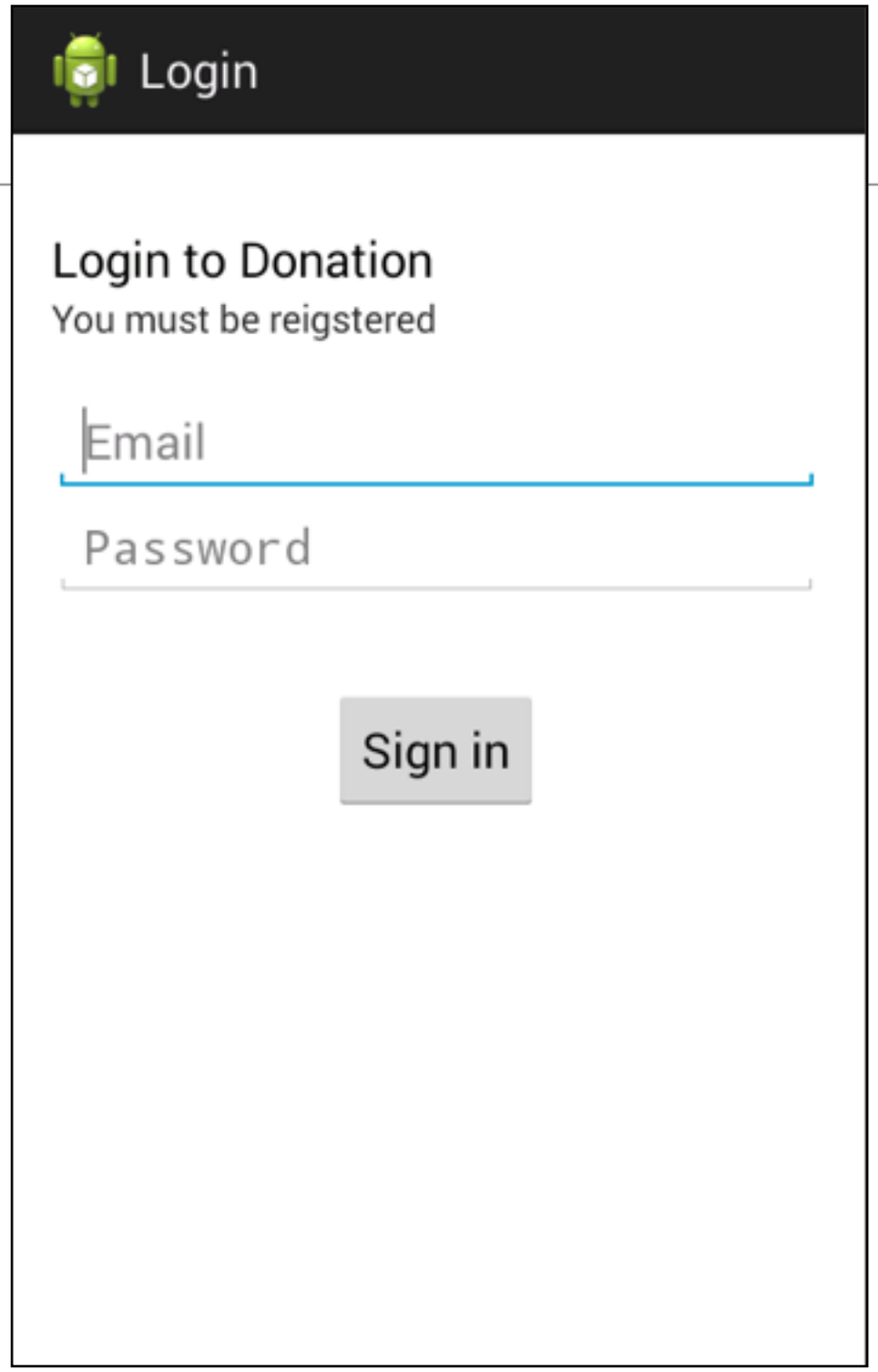
Exercise 5

- Introduce a Signup Activity, which should present the user with:
  - First Name
  - Last Name
  - Email
  - Password
  - + 'Register' button.
- Pressing Register should take you directly to "Donate" activity



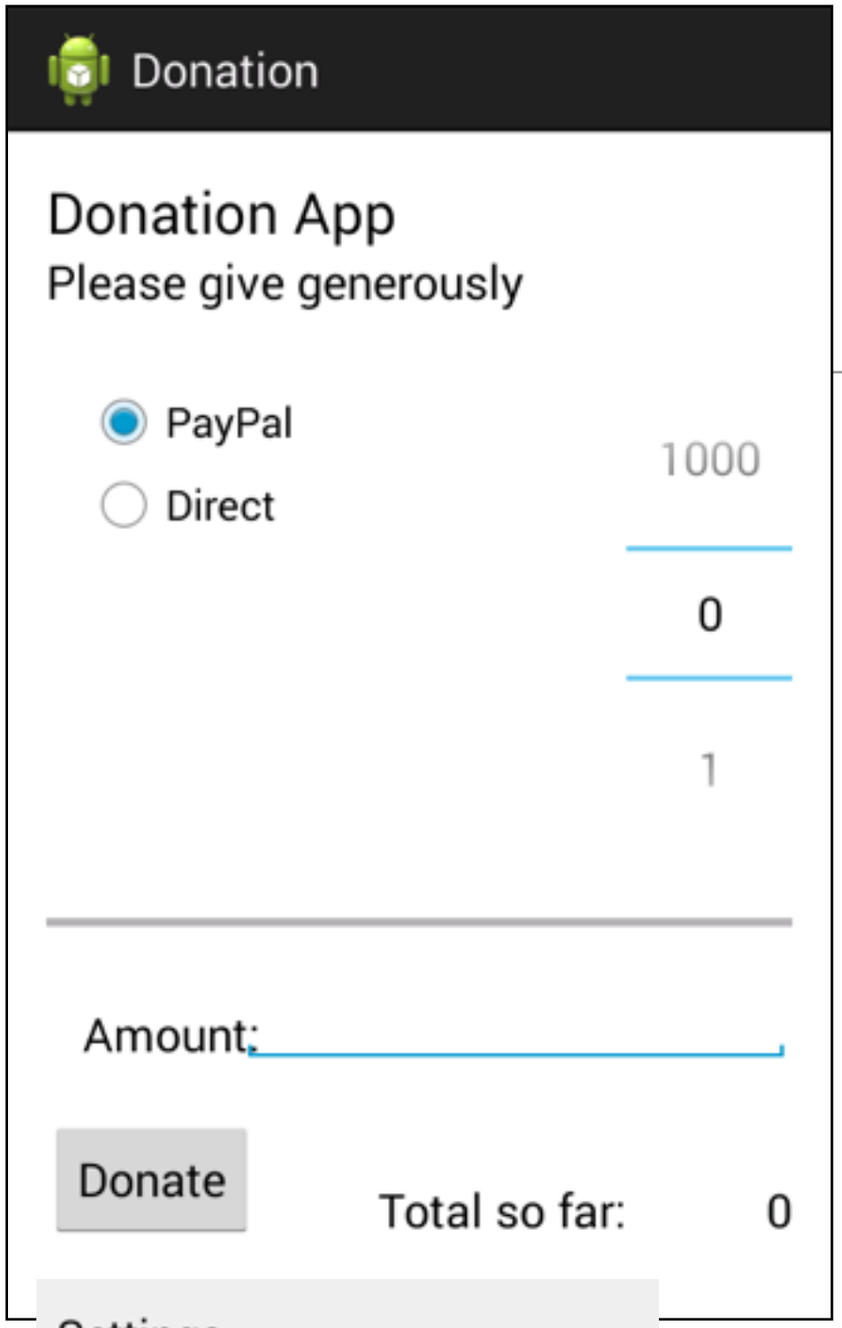
Exercise 6

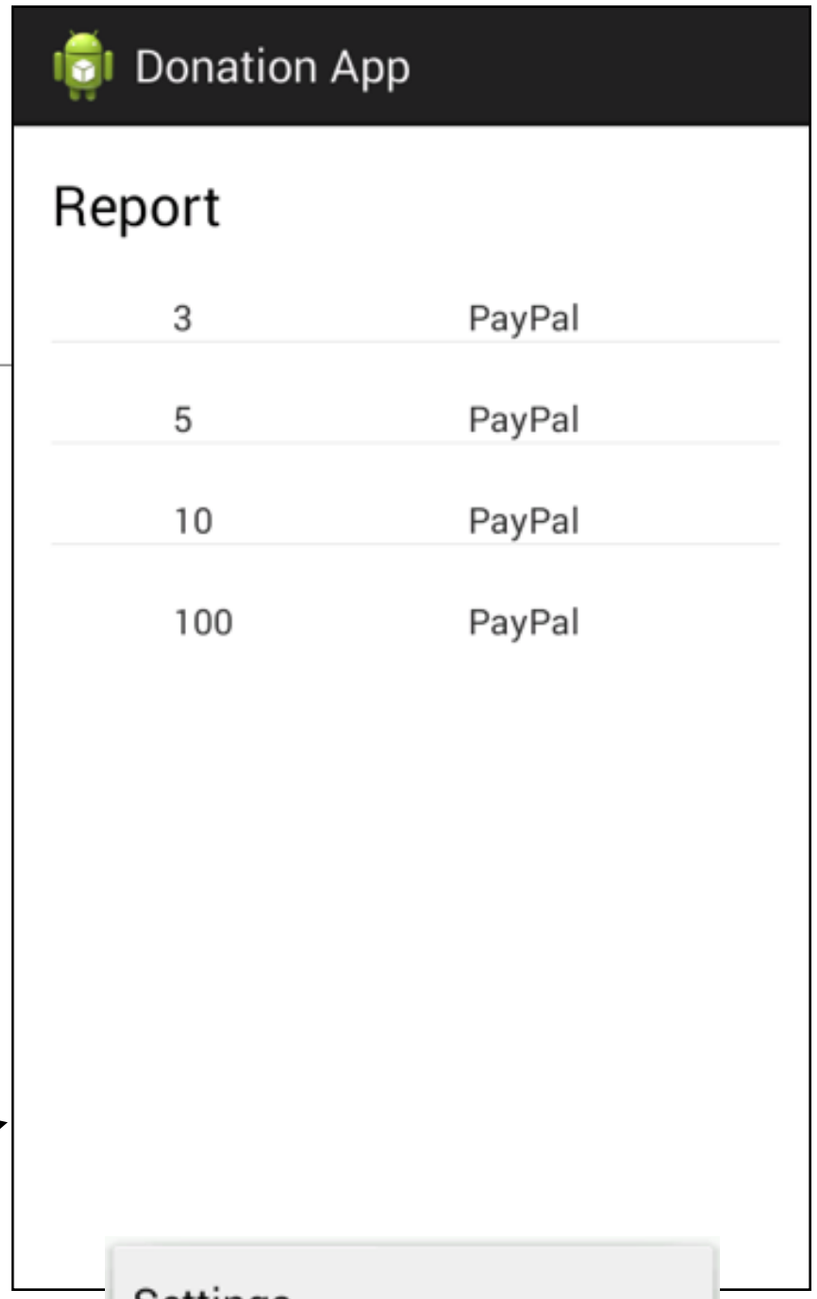
- Introduce a Login activity, which should just look for
  - email
  - password
  - + a 'Sign in' button
- Pressing Login should take you directly to "Donate" activity.

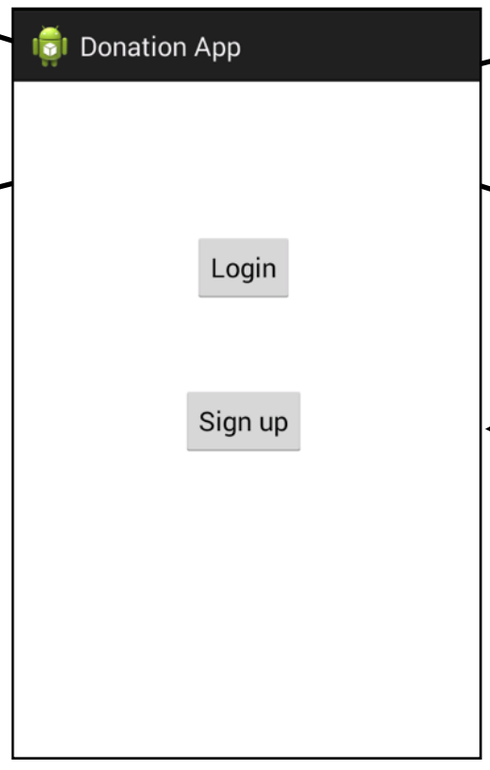


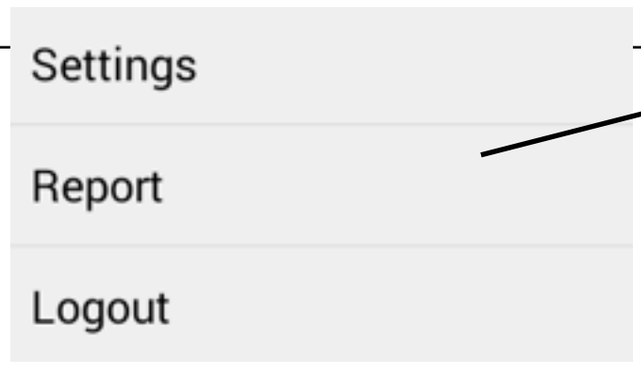
Exercise 7

- Bring in a new menu option - 'logout'. It should take you to the welcome screen.









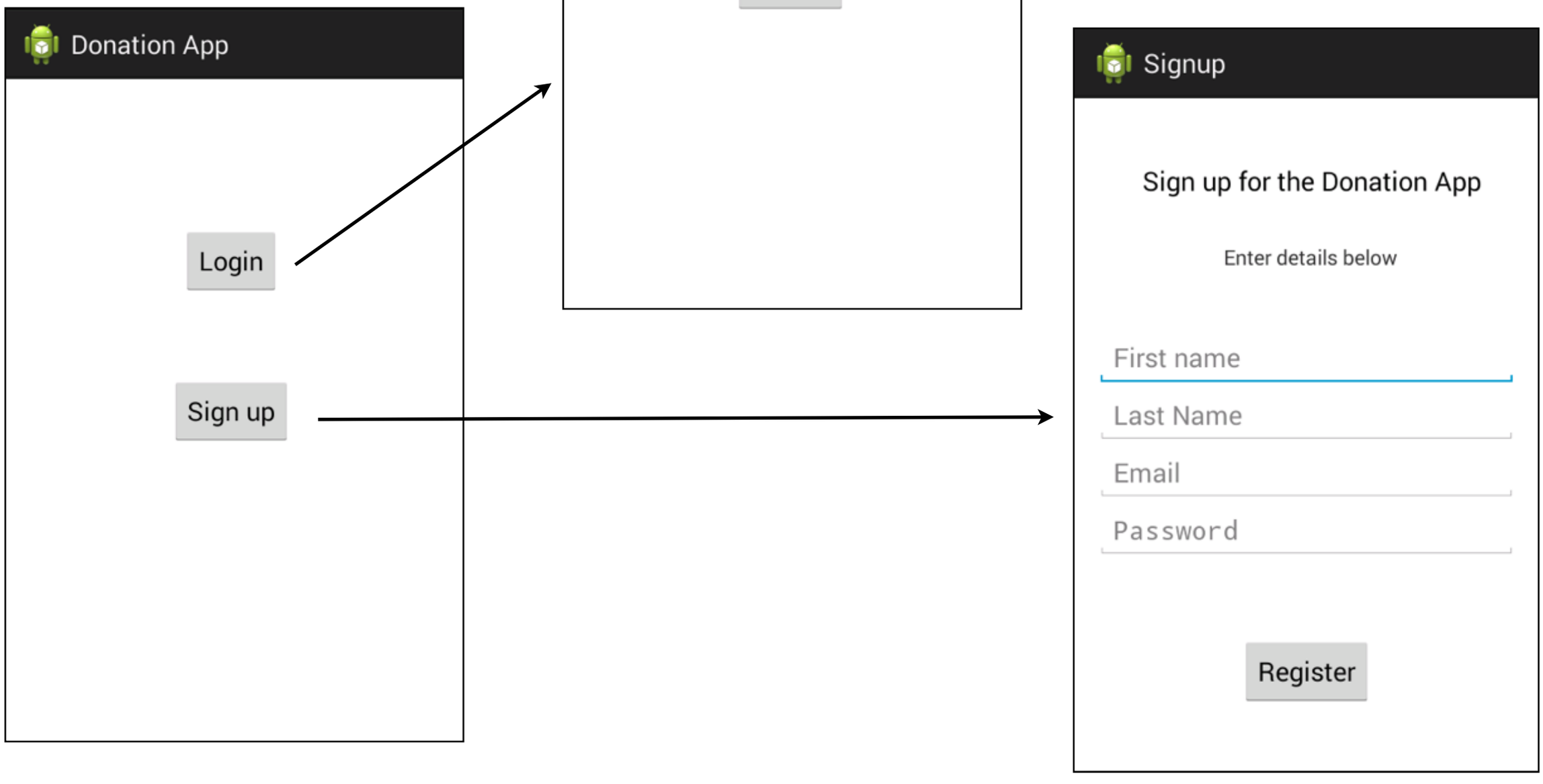
Exercise 8

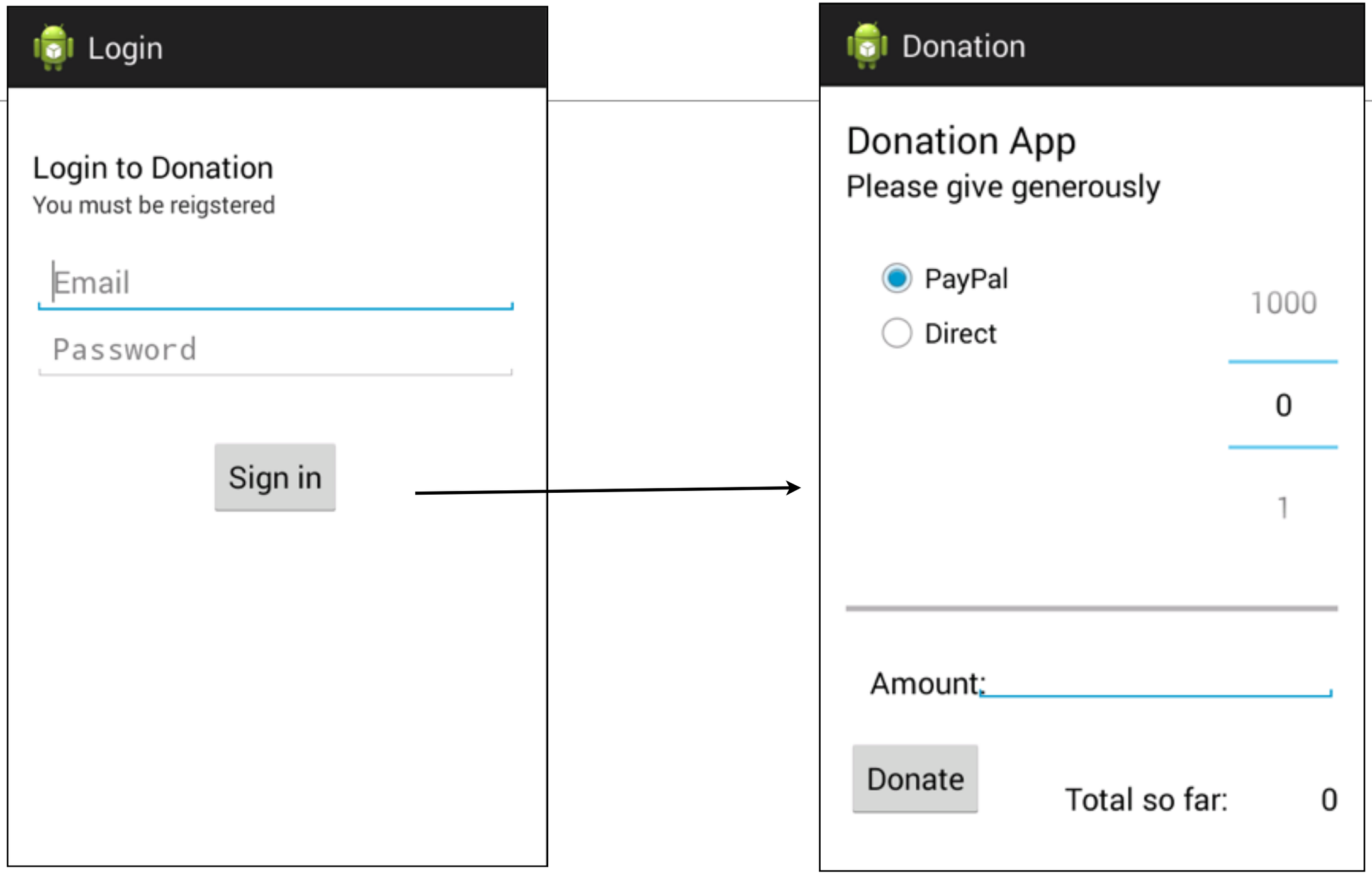
- Introduce a 'User' into the models package to represent the user in the usual way. Maintain a list of Users in the DonationApp object. Whenever anyone registers, then create a new User object in this list.

Exercise 9

- Implement the Login activity, to now only let users in to Donate if they are registered (i.e. a matching email + password in the list of users maintained by DonationApp)

Navigation Structure


Donation App
Login
Sign up
Login
Login to Donation
You must be reigstered
Email
Password
Sign in
Signup
Sign up for the Donation App
Enter details below
First name
Last Name
Email
Password
Register


Login
Login to Donation
You must be reigstered
Email
Password
Sign in
Donation
Donation App
Please give generously
PayPal
Direct
1000
0
1
Amount:
Donate
Total so far:
0

Donation

Donation App

Please give generously

PayPal

Direct

1000

0

1

Amount:

Donate

Total so far: 0

Settings

Report

Logout

Donation App

Login

Sign up

Donation App

Report

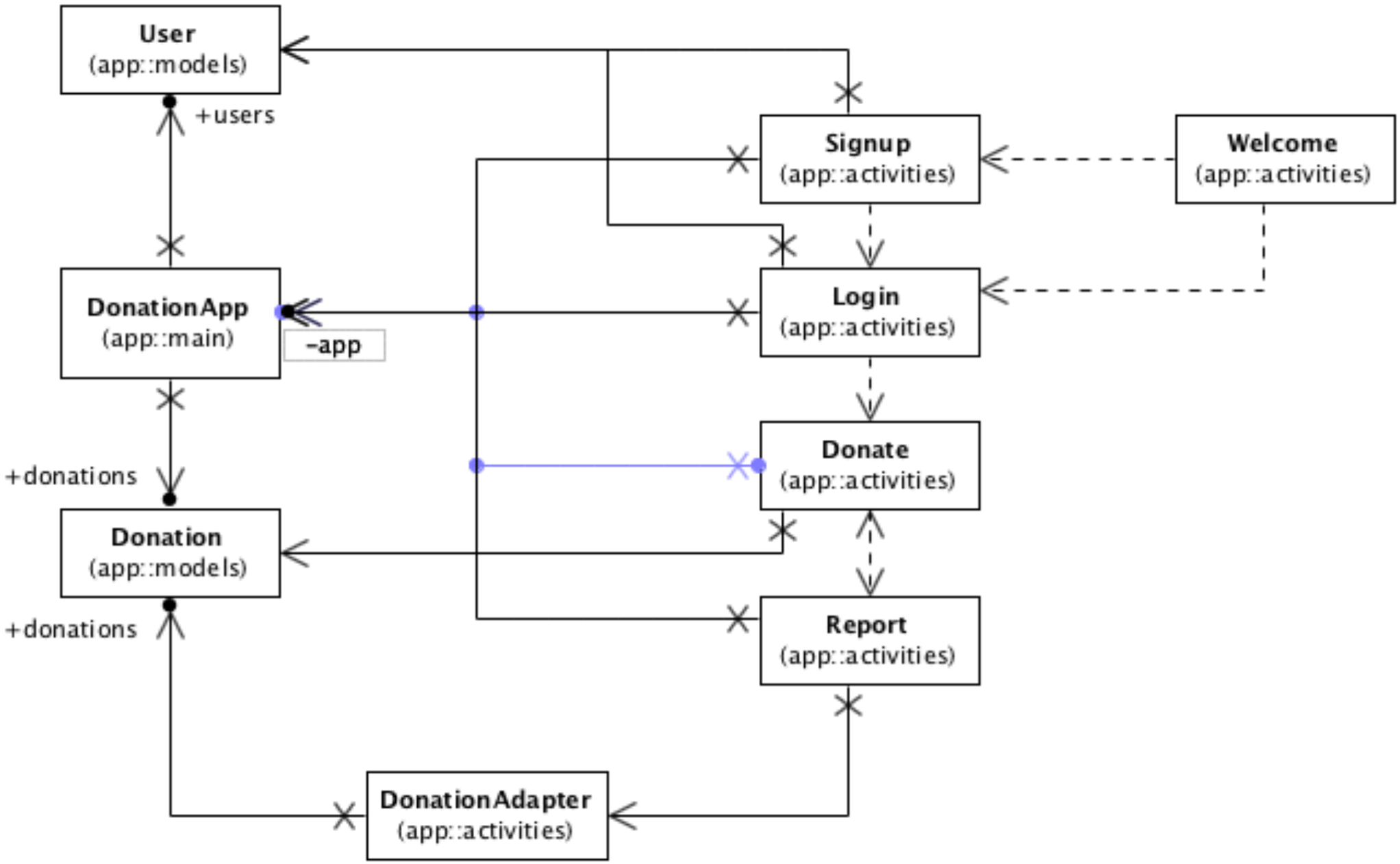
3	PayPal
5	PayPal
10	PayPal
100	PayPal

Settings

Donate

Logout

UML Model of donation-android-v3



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