Mobile Application Development

Higher Diploma in Science in Computer Science

Produced by

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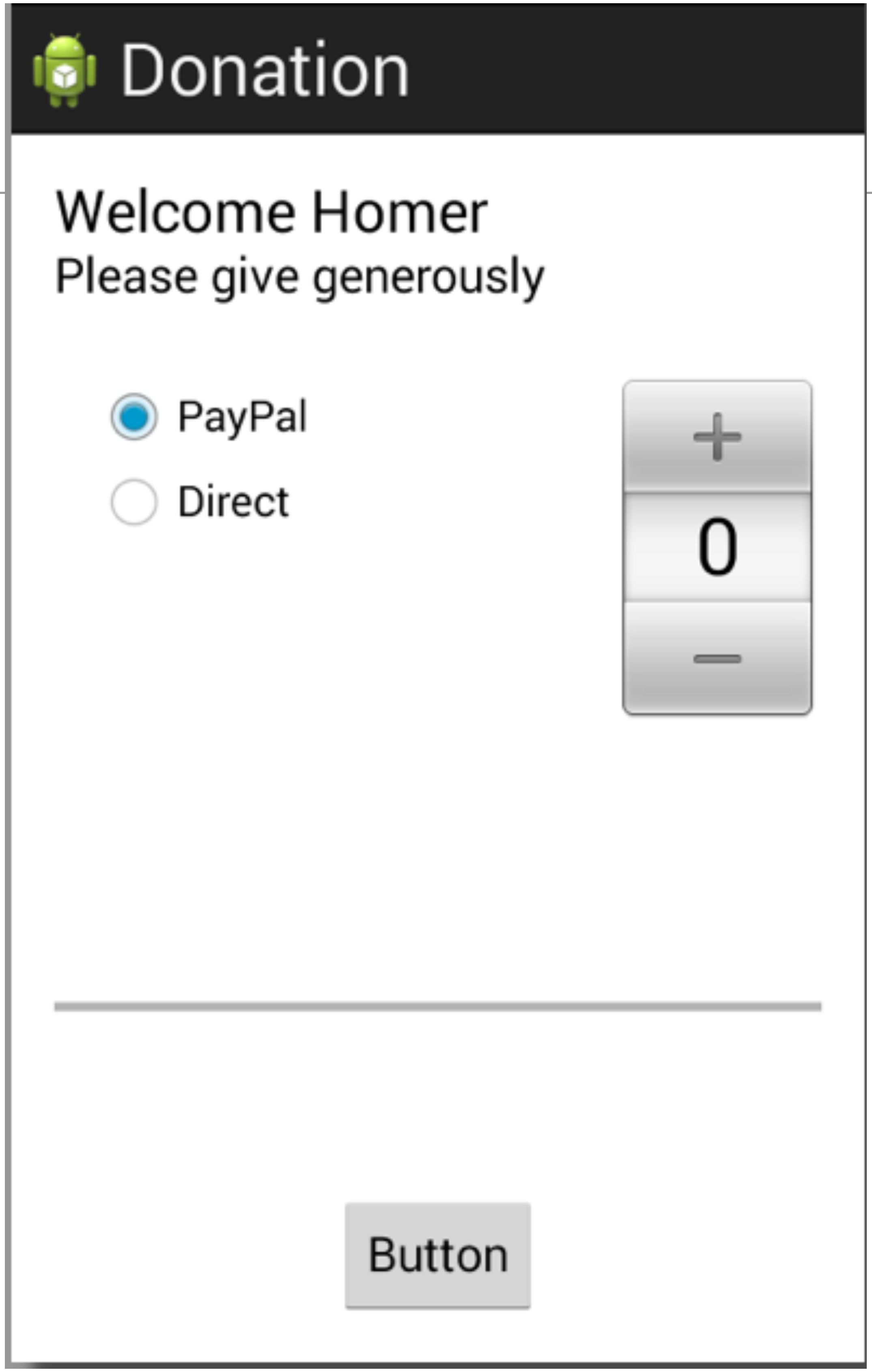
eLearning
support unit

donation-android - v3

Donation Android v1


Donation

Welcome Homer

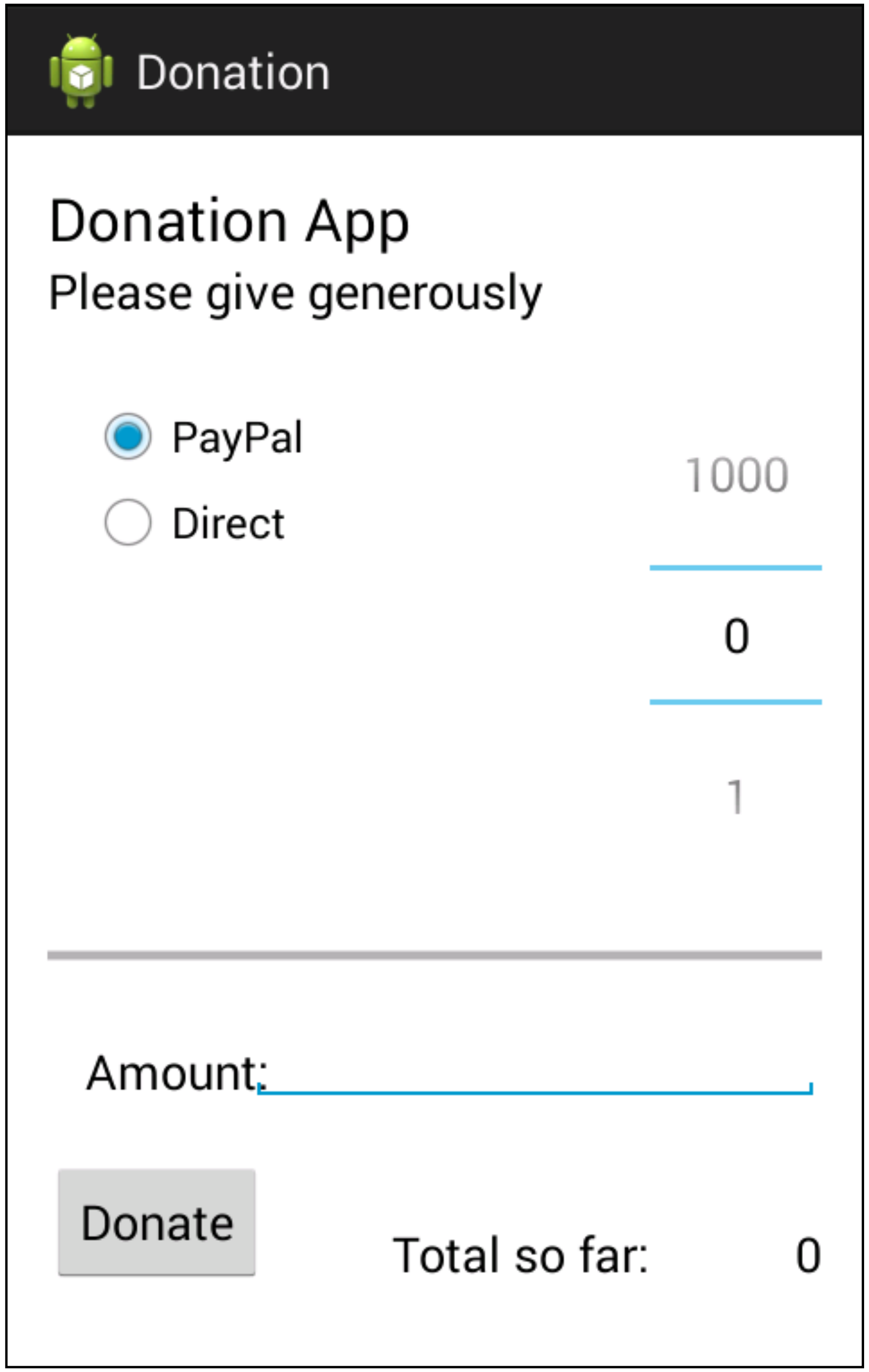
Please give generously

● PayPal

○ Direct

+
0
−
Button

Donation Android v2



Donation

Donation App

Please give generously

● PayPal

○ Direct

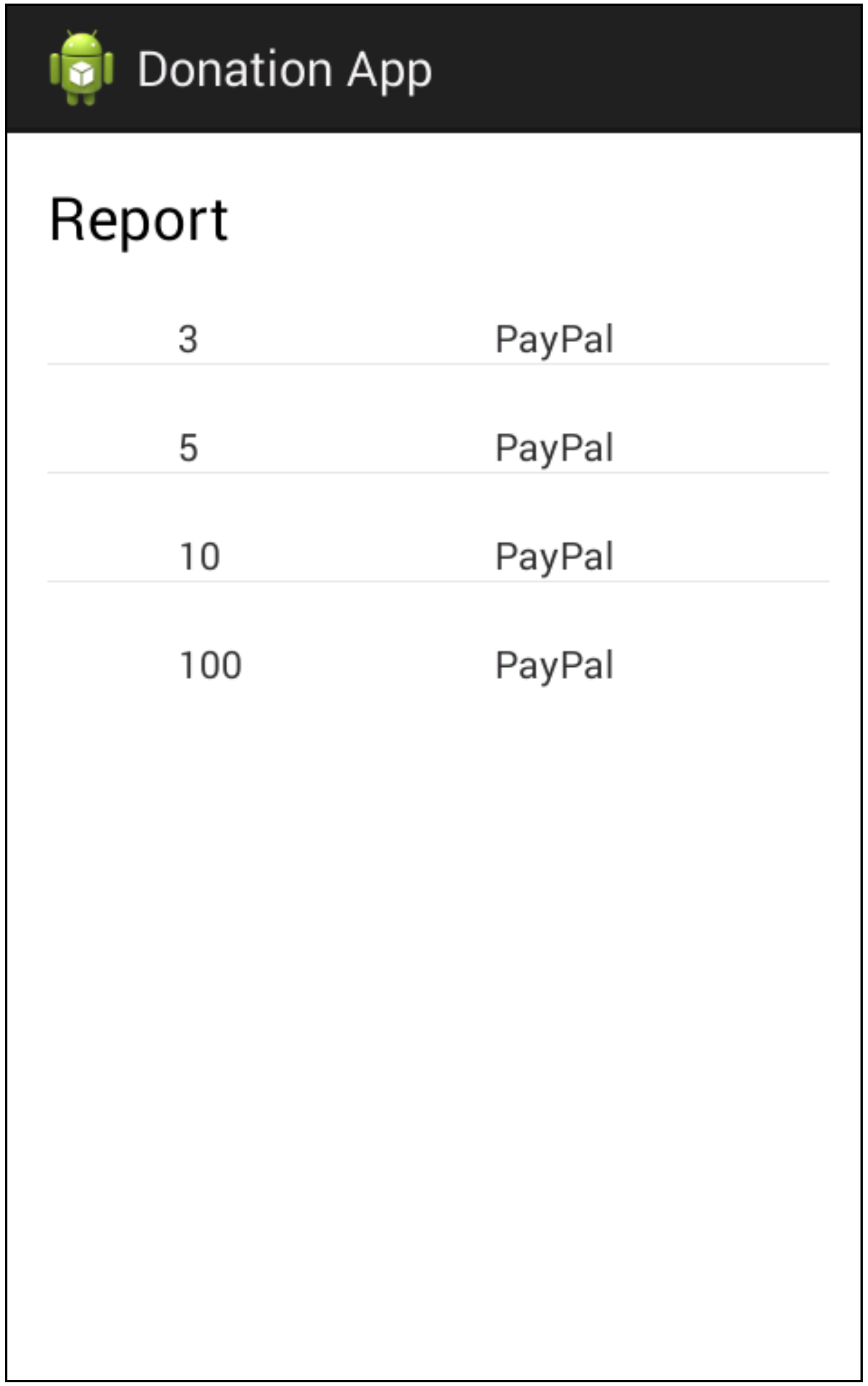
1000

0

1

Amount:

Total so far: 0



Donation App

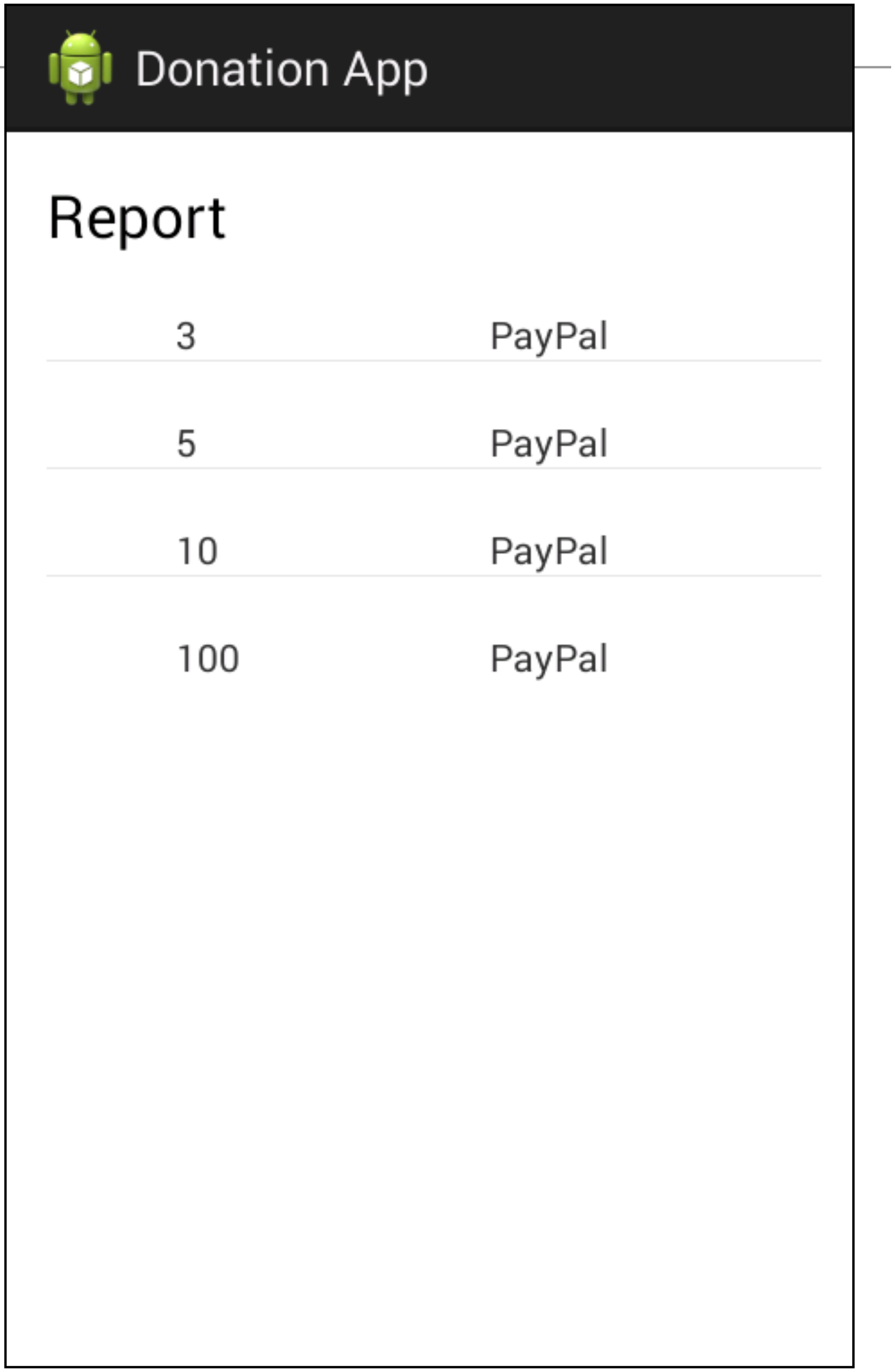
Report

3	PayPal
5	PayPal
10	PayPal
100	PayPal

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.



Report

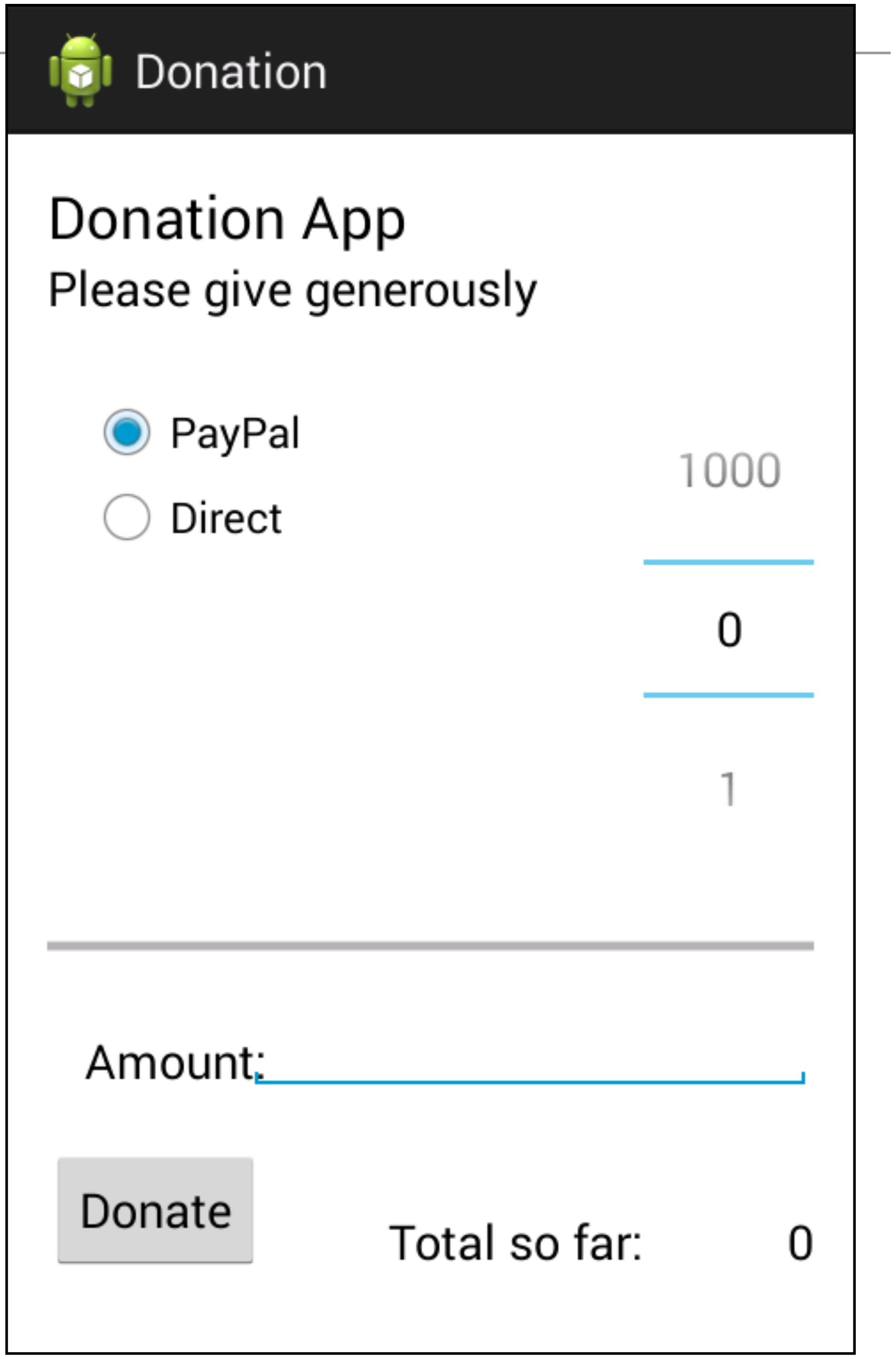
3	PayPal
5	PayPal
10	PayPal
100	PayPal

Exercise 1 Solution

```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>
```

Exercise 2

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


Donation
Donation App
Please give generously
● PayPal
○ Direct
1000
0
1
Amount:
Donate
Total so far:
0

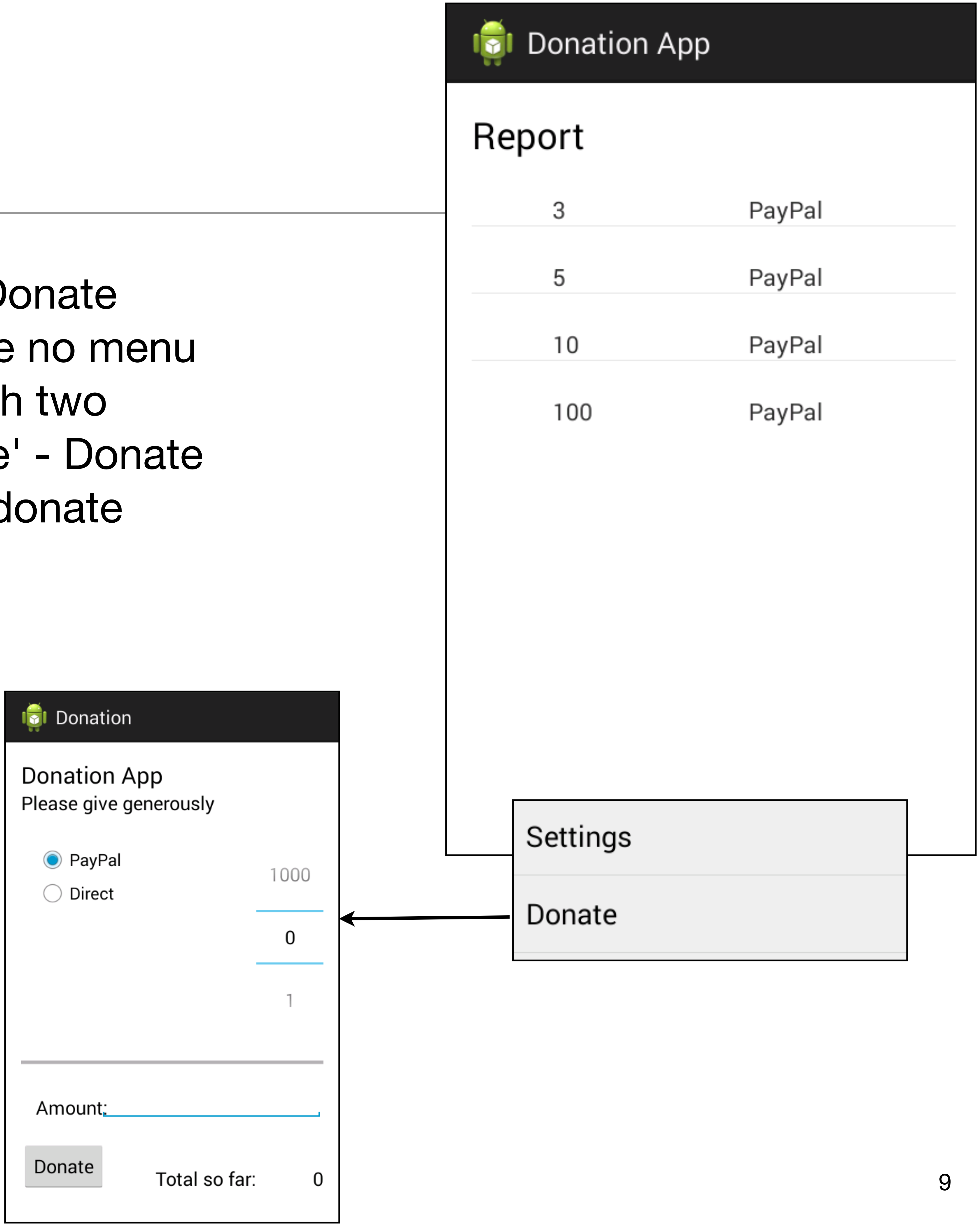
Exercise 2 Solution

- Add these two lines at the end of Donate.donateButton()

```
    amountText.setText("");
    amountPicker.setValue(0);
```

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.



Donation App

Report

3	PayPal
5	PayPal
10	PayPal
100	PayPal

Donation

Donation App
Please give generously

● PayPal
○ Direct

Amount:

Total so far: 0

Exercise 3 Solution

- Introduce a new string constant into strings.xml:

```
    <string name="menuDonate">Donate</string>
```

- Then a new menu - report.xml

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

    <item android:id="@+id/action_settings"
          android:title="@string/action_settings"
          android:orderInCategory="100"/>
    <item
        android:id="@+id/menuDonate"
        android:orderInCategory="100"
        android:title=“@string/menuDonate"/>

</menu>
```

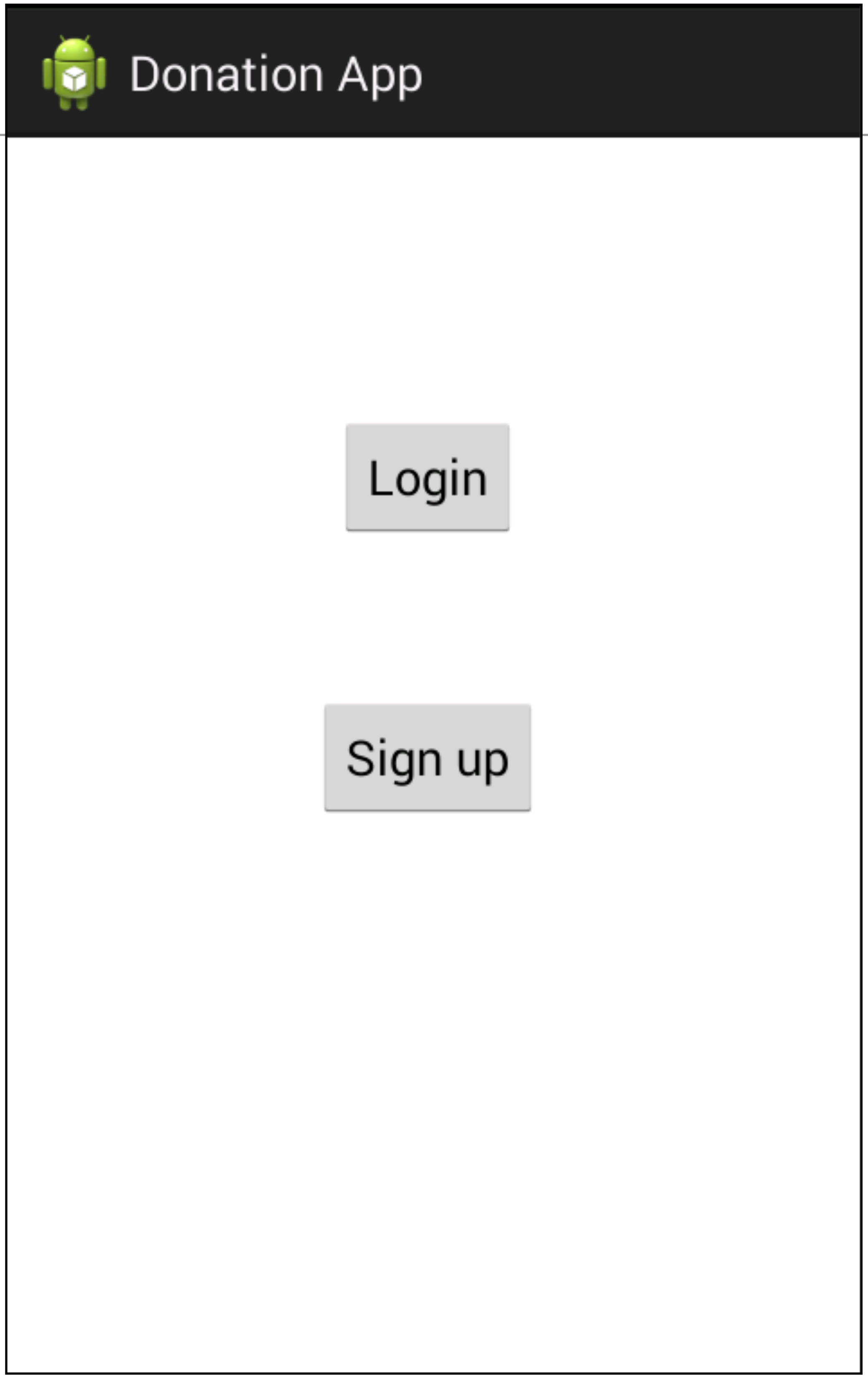
Exercise 3 Solution

- The report activity will then need two new methods:

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

  @Override
  public void onCreate(Bundle savedInstanceState)
  {
    ...
  }

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

  @Override
  public boolean onOptionsItemSelected(MenuItem item)
  {
    switch (item.getItemId())
    {
      case R.id.menuDonate : startActivity (new Intent(this, Donate.class));
        break;
      case R.id.menuLogout : startActivity (new Intent(this, Welcome.class));
        break;
    }
    return true;
  }
}
```

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).


Donation App
Login
Sign up

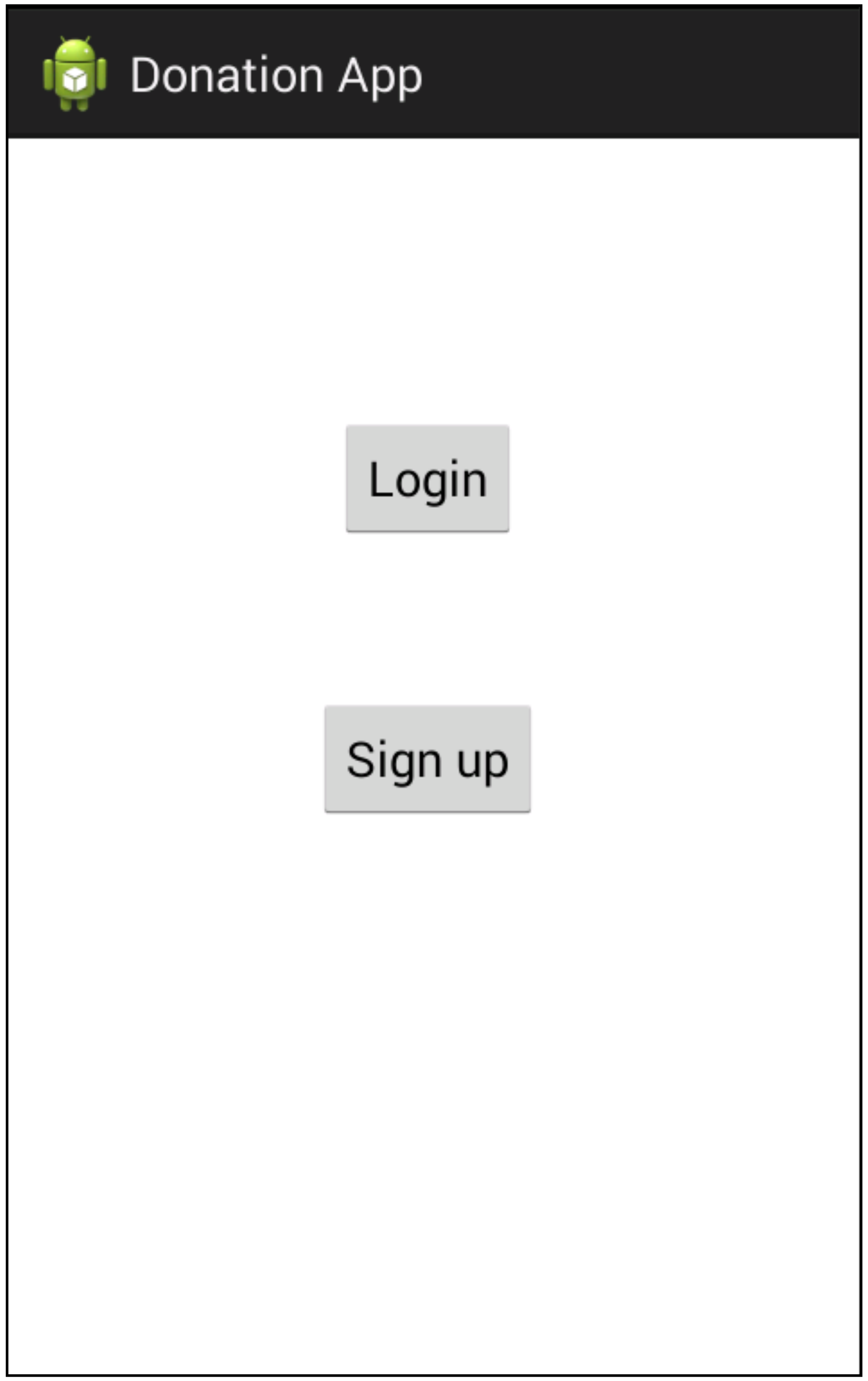
Exercise 4 Solution

- strings.xml

```
<string name="welcomeLogin">Login</string>
<string name="welcomeSignup">Sign up</string>
```

- activity_welcome.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android=“http://sch……”
                android:id="@+id/RelativeLayout"
                android:layout_width="match_parent"
                android:layout_height="match_parent"
                android:orientation="vertical" >

    <Button
        android:id="@+id/welcomeLogin"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentTop="true"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="102dp"
        android:onClick="loginPressed"
        android:text="@string/welcomeLogin" />

    <Button
        android:id="@+id/welcomeSignup"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerHorizontal="true"
        android:layout_centerVertical="true"
        android:onClick="signupPressed"
        android:text="@string/welcomeSignup" />

</RelativeLayout>
```


Donation App
Login
Sign up

Exercise 4 Solution

AndroidManifext.xml

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

    <application
        android:name=".main.DonationApp"
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:theme="@style/AppTheme" >
        <activity
            android:name=".activity.Welcome"
            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=".activity.Donate"
            android:label="@string/app_name" >
        </activity>
        <activity
            android:name=".activity.Report"
            android:label="@string/app_name" >
        </activity>
    </application>
</manifest>
```

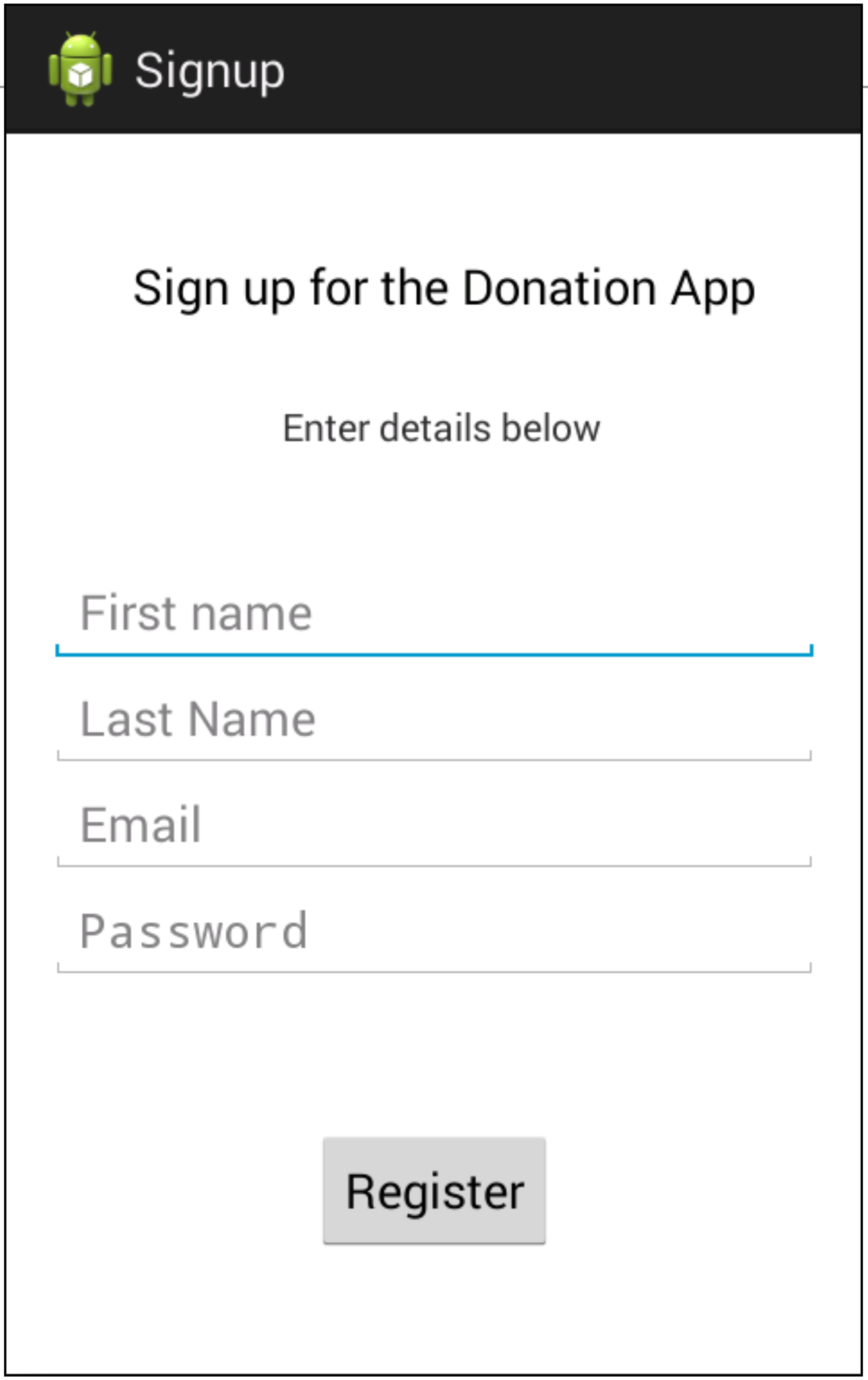
```java
public class Welcome extends Activity
{
  @Override
  public void onCreate(Bundle savedInstanceState)
  {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_welcome);
  }
}
```

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

    <Button
        android:id="@+id/welcomeLogin"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentTop="true"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="102dp"
        android:onClick="loginPressed"
        android:text="@string/welcomeLogin" />

    <Button
        android:id="@+id/welcomeSignup"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerHorizontal="true"
        android:layout_centerVertical="true"
        android:onClick="signupPressed"
        android:text="@string/welcomeSignup" />

</RelativeLayout>
```

```java
public class Welcome extends Activity
{
  @Override
  public void onCreate(Bundle savedInstanceState)
  {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_welcome);
  }

  public void loginPressed (View view)
  {
    startActivity (new Intent(this, Login.class));
  }

  public void signupPressed (View view)
  {
    startActivity (new Intent(this, Signup.class));
  }
}
```

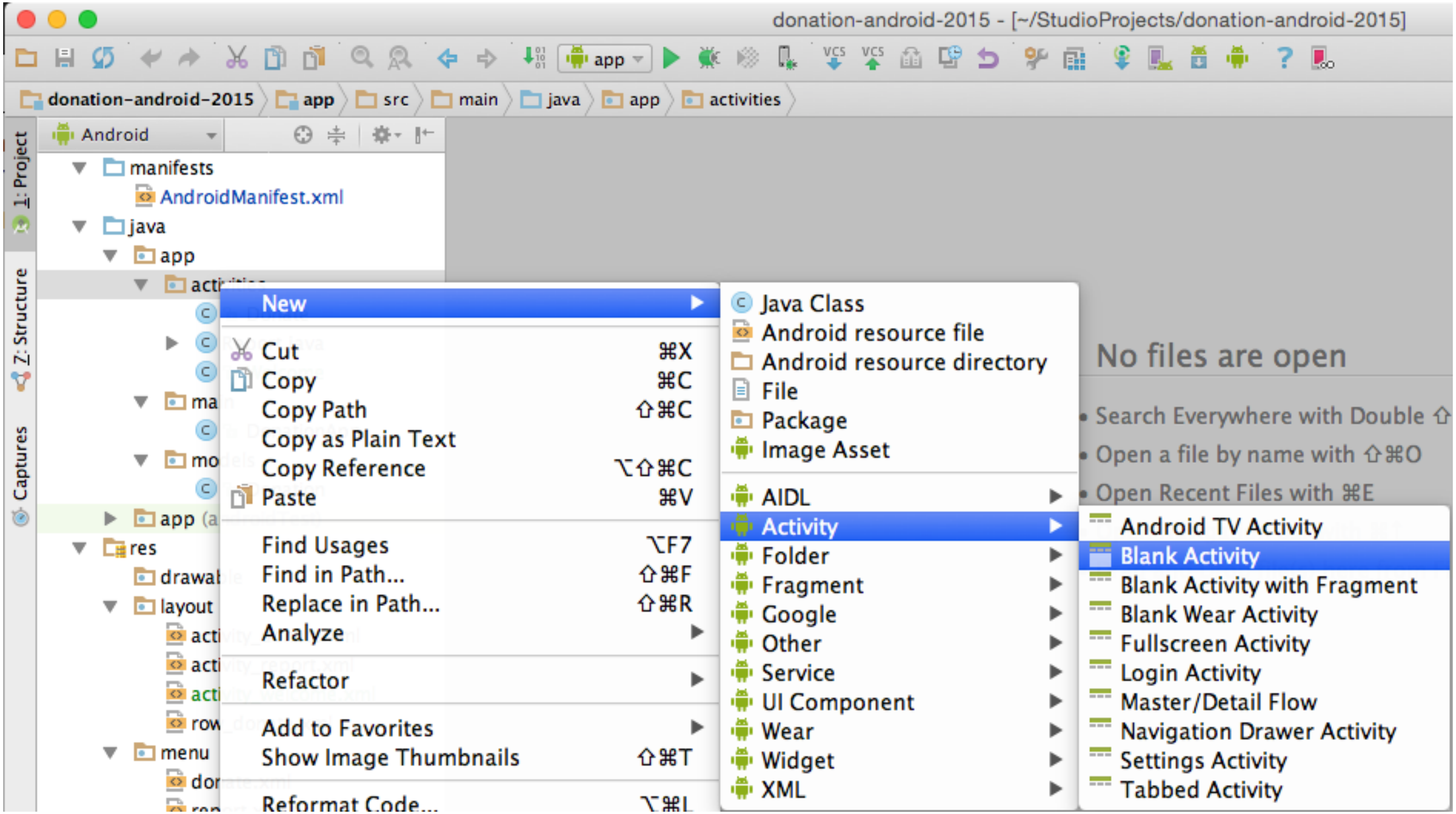
Exercise 5

- 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

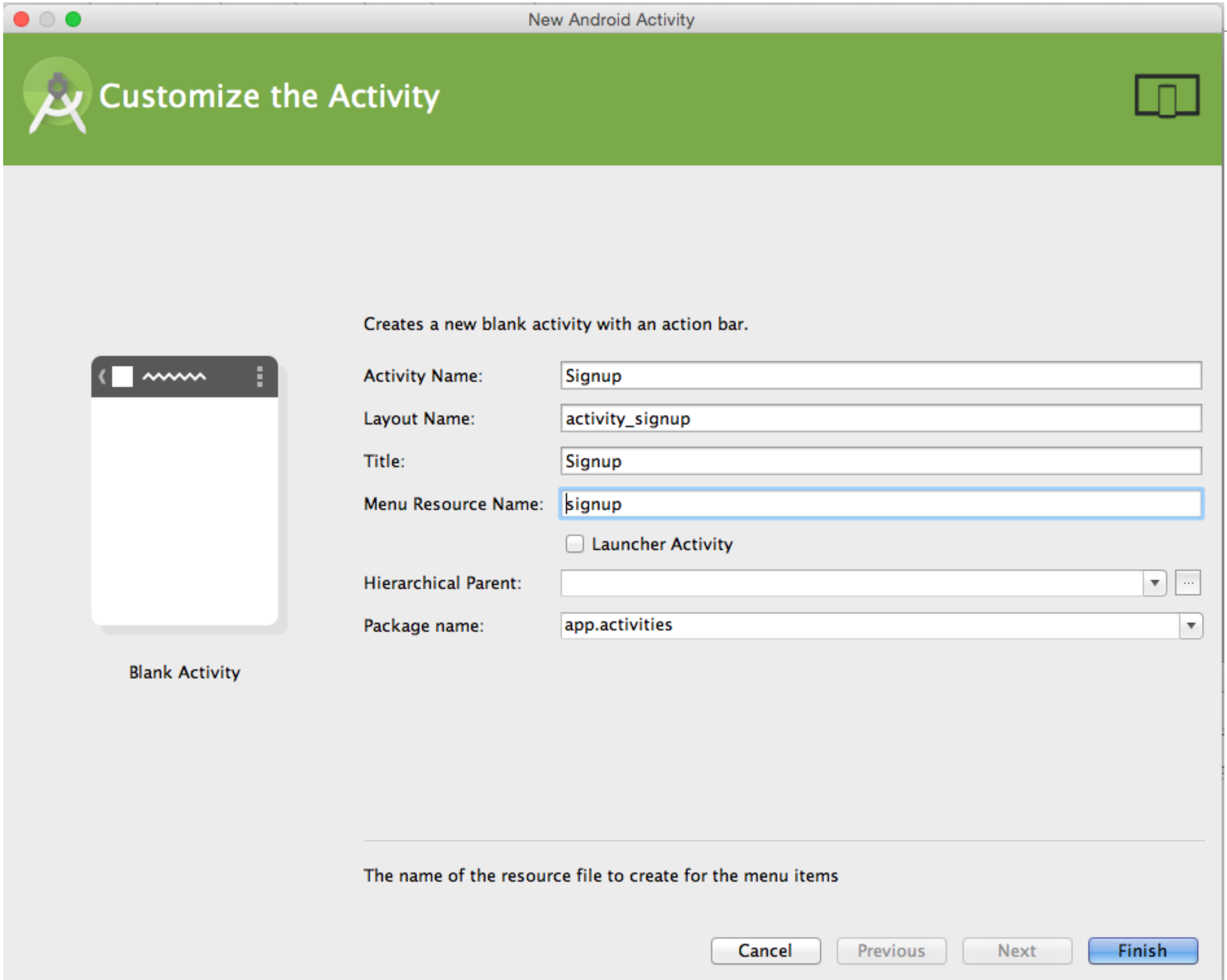


Signup
Sign up for the Donation App
Enter details below
First name
Last Name
Email
Password
Register

Exercise 5 Solution


donation-android-2015 - [~/StudioProjects/donation-android-2015]
app
donation-android-2015 > app > src > main > java > app > activities
1: Project
7: Structure
Captures
Android
manifests
AndroidManifest.xml
java
app
activities
res
drawable
layout
menu
No files are open
• Search Everywhere with Double ⇧
• Open a file by name with ⇧⌘O
• Open Recent Files with ⌘E
New
Cut ⌘X
Copy ⌘C
Copy Path ⇧⌘C
Copy as Plain Text
Copy Reference ⌥⇧⌘C
Paste ⌘V
Find Usages ⌥F7
Find in Path... ⇧⌘F
Replace in Path... ⇧⌘R
Analyze
Refactor
Add to Favorites
Show Image Thumbnails ⇧⌘T
Reformat Code... ⌥⌘L
Java Class
Android resource file
Android resource directory
File
Package
Image Asset
AIDL
Activity
Folder
Fragment
Google
Other
Service
UI Component
Wear
Widget
XML
Android TV Activity
Blank Activity
Blank Activity with Fragment
Blank Wear Activity
Fullscreen Activity
Login Activity
Master/Detail Flow
Navigation Drawer Activity
Settings Activity
Tabbed Activity

Exercise 5 Solution


New Android Activity
Customize the Activity
Blank Activity
Cancel
Previous
Next
Finish

Creates a new blank activity with an action bar.

Activity Name: Signup

Layout Name: activity_signup

Title: Signup

Menu Resource Name: signup

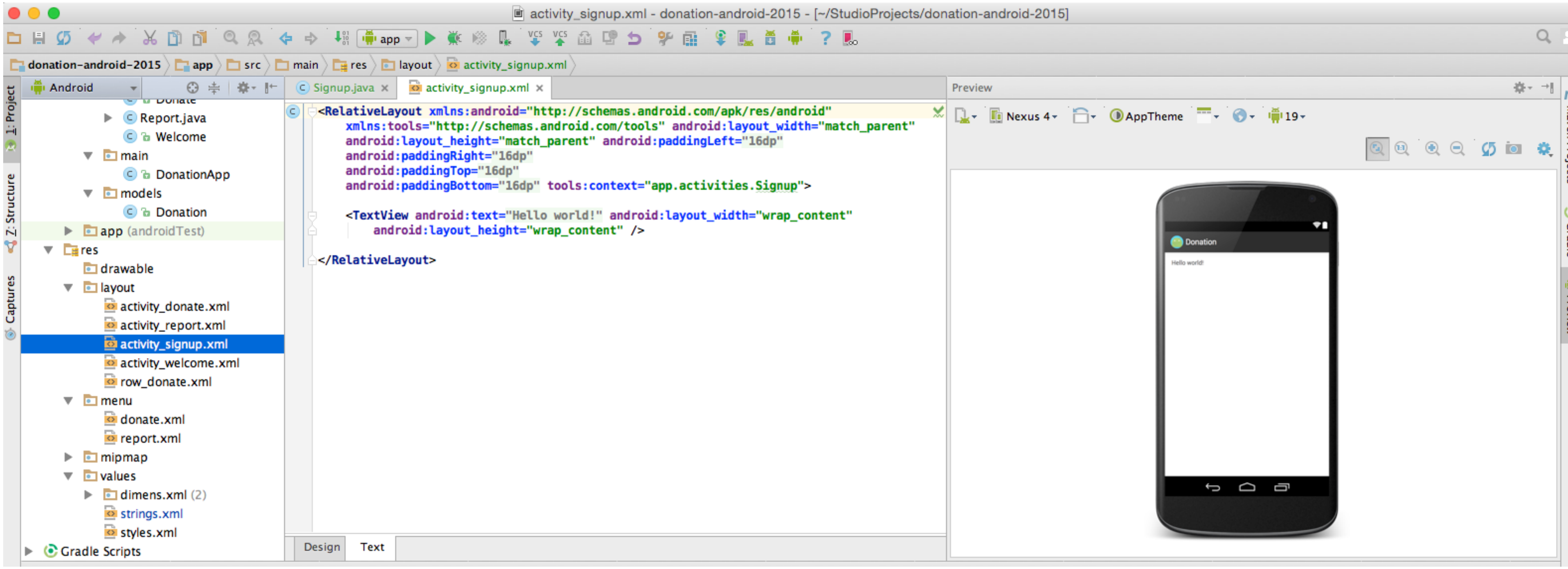
☐ Launcher Activity

Hierarchical Parent:

Package name: app.activities

The name of the resource file to create for the menu items

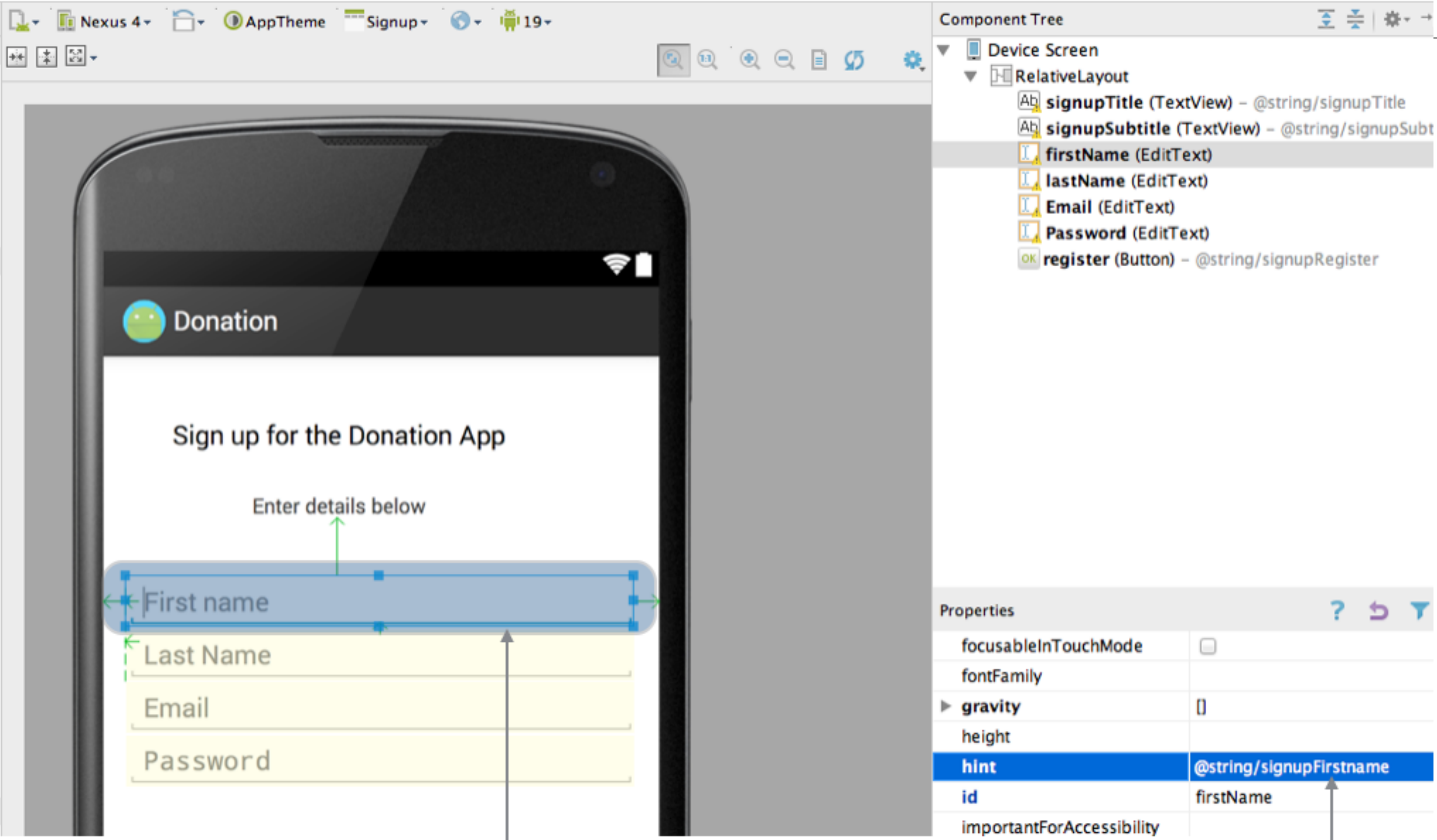
Exercise 5 Solution


activity_signup.xml - donation-android-2015 - [~/StudioProjects/donation-android-2015]
donation-android-2015
app
src
main
res
layout
activity_signup.xml
Android
Signup.java
activity_signup.xml
Preview
Report.java
Welcome
main
DonationApp
models
Donation
app (androidTest)
res
drawable
layout
activity_donate.xml
activity_report.xml
activity_signup.xml
activity_welcome.xml
row_donate.xml
menu
donate.xml
report.xml
mipmap
values
dimens.xml (2)
strings.xml
styles.xml
Gradle Scripts
Nexus 4
AppTheme
19
Donation
Hello world!
Design
Text
1: Project
2: Structure
Captures

```
<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:paddingLeft="16dp"
    android:paddingRight="16dp"
    android:paddingTop="16dp"
    android:paddingBottom="16dp" tools:context="app.activities.Signup">

    <TextView android:text="Hello world!" android:layout_width="wrap_content"
        android:layout_height="wrap_content" />

</RelativeLayout>
```

Exercise 5 Solution

Add a hint (placeholder)



Sign up for the Donation App

Enter details below

First name

Last Name

Email

Password

Component Tree

- Device Screen
  - RelativeLayout
    - **signupTitle** (TextView) – @string/signupTitle
    - **signupSubtitle** (TextView) – @string/signupSubt
    - **firstName** (EditText)
    - **lastName** (EditText)
    - **Email** (EditText)
    - **Password** (EditText)
    - **register** (Button) – @string/signupRegister

Properties

focusableInTouchMode	☐
fontFamily	
gravity	[]
height	
hint	@string/signupFirstname
id	firstName
importantForAccessibility	

```
<string name="signupFirstname">First name</string>
```

Add hint in Properties

Exercise 5 Solution

strings.xml

```
<string name="title_activity_signup">Signup</string>
<string name="signupTitle">Sign up for the Donation App</
string>
<string name="signupSubtitle">Enter details below</string>
<string name="signupFirstname">First name</string>
<string name="signupLastName">Last Name</string>
<string name="signupEmail">Email</string>
<string name="signupPassword">Password</string>
<string name="signupRegister">Register</string>
```

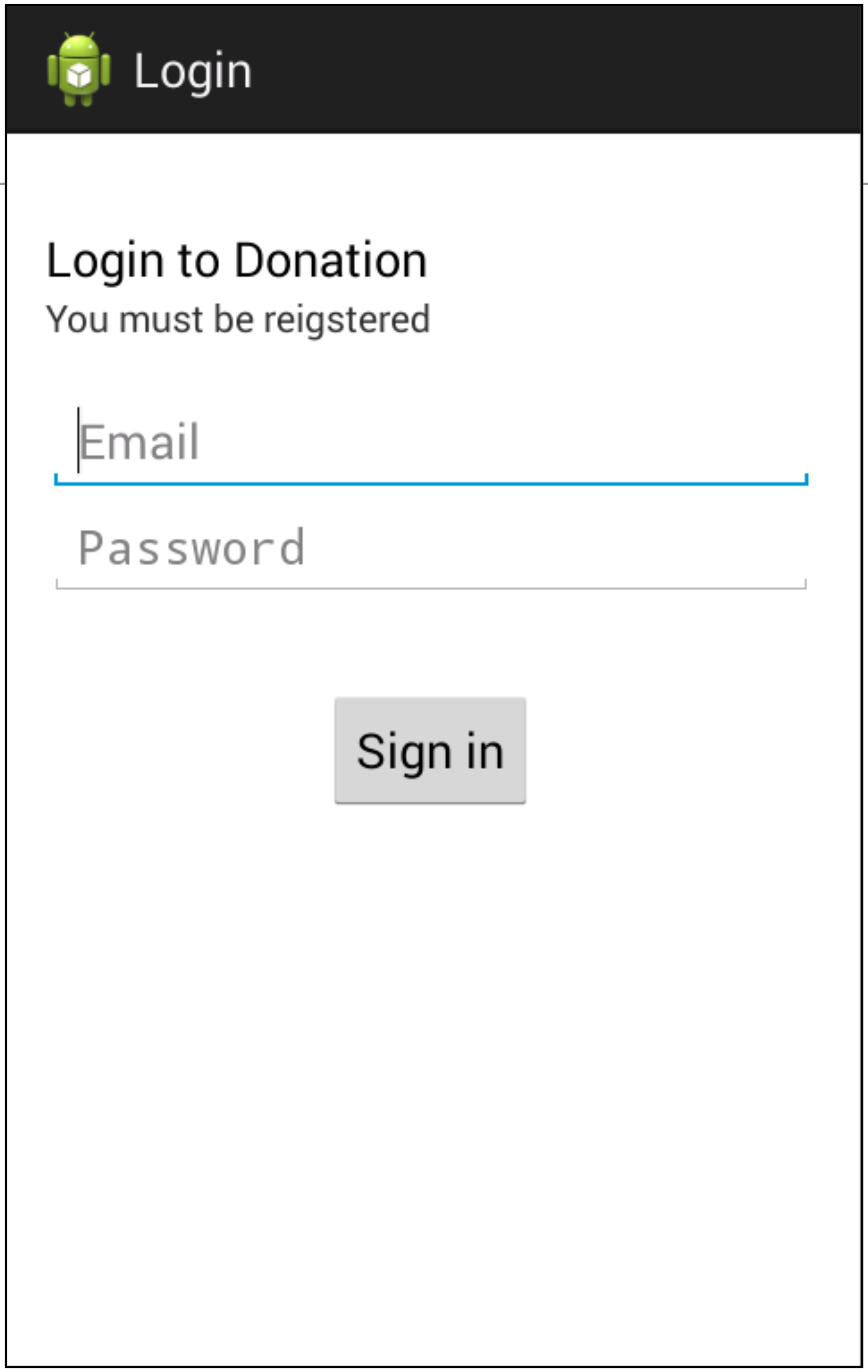
```
public class Signup extends Activity
{
  @Override
  protected void onCreate(Bundle savedInstanceState)
  {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_signup);
  }

  public void registerPressed (View view)
  {
    startActivity (new Intent(this, Welcome.class));
  }
}
```

activity_signup.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=".Signup" >

    <TextView
        android:id="@+id/signupTitle"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentLeft="true"
        android:layout_alignParentTop="true"
        android:layout_marginLeft="32dp"
        android:layout_marginTop="28dp"
        android:text="@string/signupTitle"
        android:textAppearance="?android:attr/textAppearanceMedium" />

    <TextView
        android:id="@+id/signupSubtitle"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignLeft="@+id/signupTitle"
        android:layout_below="@+id/signupTitle"
        android:layout_marginLeft="55dp"
        android:layout_marginTop="30dp"
        android:text="@string/signupSubtitle"
        android:textAppearance="?android:attr/textAppearanceSmall" />

    <EditText
        android:id="@+id/firstName"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentLeft="true"
        android:layout_alignParentRight="true"
        android:layout_below="@+id/signupSubtitle"
        android:layout_marginTop="40dp"
        android:ems="10"
        android:hint="@string/signupFirstname"
        android:inputType="textPersonName"/>

        <requestFocus />

    <EditText
        android:id="@+id/lastName"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignLeft="@+id/firstName"
        android:layout_alignParentRight="true"
        android:layout_below="@+id/firstName"
        android:ems="10"
        android:hint="@string/signupLastName"
        android:inputType="textPersonName" >

    </EditText>

    <EditText
        android:id="@+id/Email"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignLeft="@+id/lastName"
        android:layout_alignParentRight="true"
        android:layout_below="@+id/lastName"
        android:ems="10"
        android:hint="@string/signupEmail"
        android:inputType="textEmailAddress" />

    <EditText
        android:id="@+id/Password"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignLeft="@+id/Email"
        android:layout_alignParentRight="true"
        android:layout_below="@+id/Email"
        android:ems="10"
        android:hint="@string/signupPassword"
        android:inputType="textPassword" />

    <Button
        android:id="@+id/register"
```

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.



Login

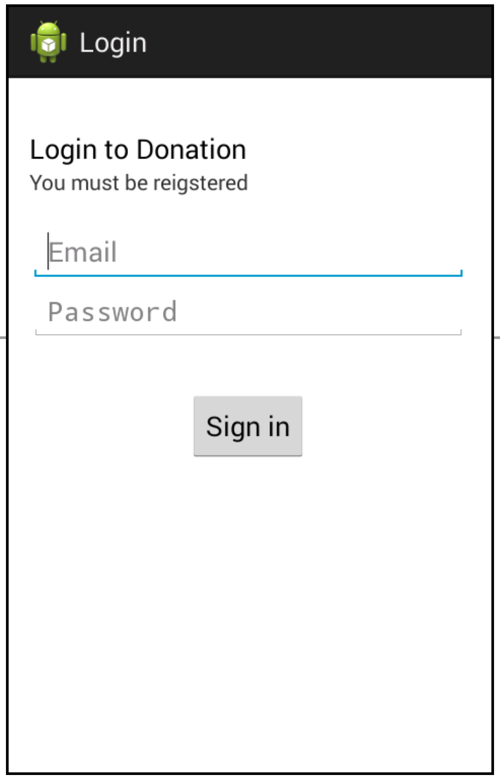
Login to Donation

You must be reigstered

Email
Password
Sign in

Exercise 6 Solution

```
<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=".Login" >

    <TextView
        android:id="@+id/loginTitle"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentLeft="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentTop="true"
        android:layout_marginTop="18dp"
        android:text="@string/loginTitle"
        android:textAppearance="?android:attr/textAppearanceMedium" />

    <TextView
        android:id="@+id/loginSubtitle"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignLeft="@+id/loginTitle"
        android:layout_alignParentRight="true"
        android:layout_below="@+id/loginTitle"
        android:text="@string/loginSubtitle"
        android:textAppearance="?android:attr/textAppearanceSmall" />

    <EditText
        android:id="@+id/loginEmail"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignLeft="@+id/loginSubtitle"
        android:layout_alignRight="@+id/loginSubtitle"
        android:layout_below="@+id/loginSubtitle"
        android:layout_marginTop="17dp"
        android:ems="10"
        android:hint="@string/loginEmail"
        android:inputType="textEmailAddress" >

        <requestFocus />
    </EditText>

    <EditText
        android:id="@+id/loginPassword"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignLeft="@+id/loginEmail"
        android:layout_alignRight="@+id/loginEmail"
        android:layout_below="@+id/loginEmail"
        android:ems="10"
        android:hint="@string/loginPassword"
        android:inputType="textPassword" />

    <Button
        android:id="@+id/login"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerHorizontal="true"
        android:layout_centerVertical="true"
        android:onClick="signinPressed"
        android:text="@string/loginSignin" />

</RelativeLayout>
```



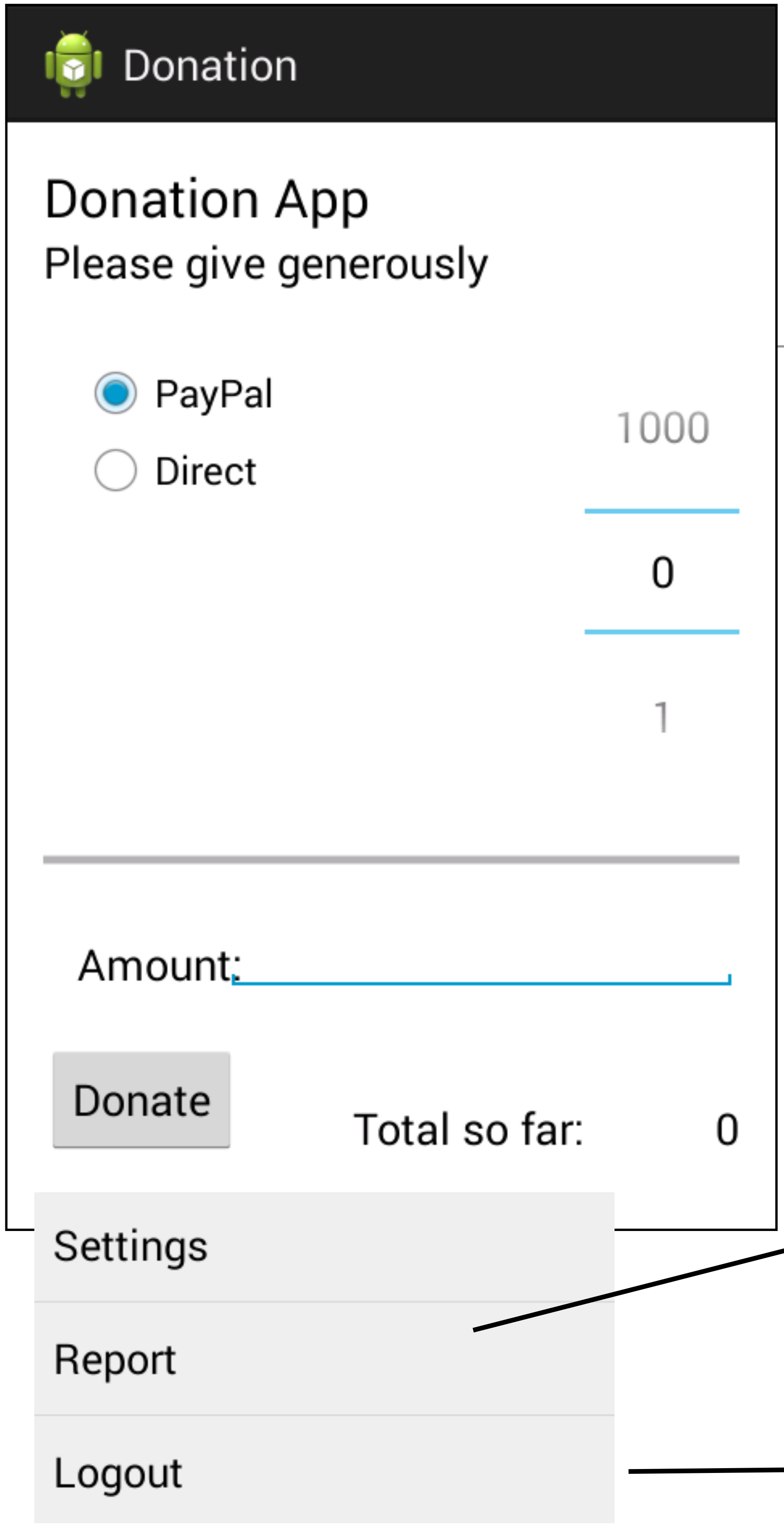
Login to Donation

You must be reigstered

```
public class Login extends Activity
{
  @Override
  protected void onCreate(Bundle savedInstanceState)
  {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_login);
  }

  public void signinPressed (View view)
  {
    startActivity (new Intent(this, Donate.class));
  }
}
```

Exercise 7

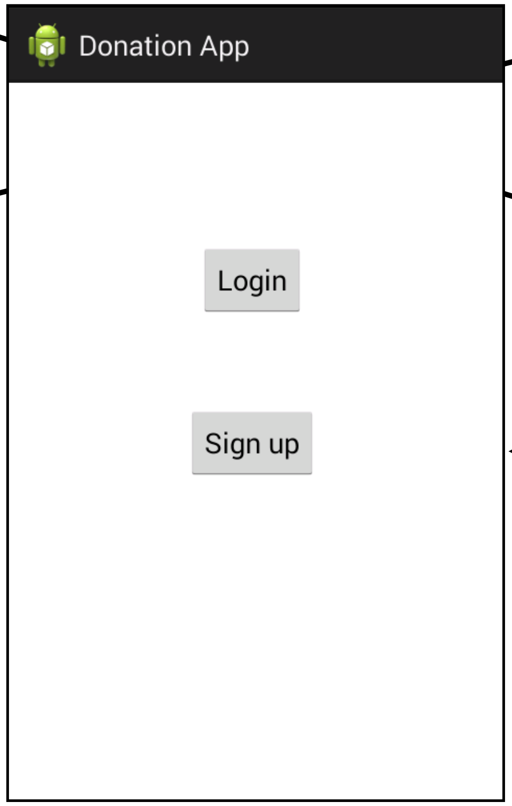
- Bring in a new menu option - 'logout'. It should take you to the welcome screen.

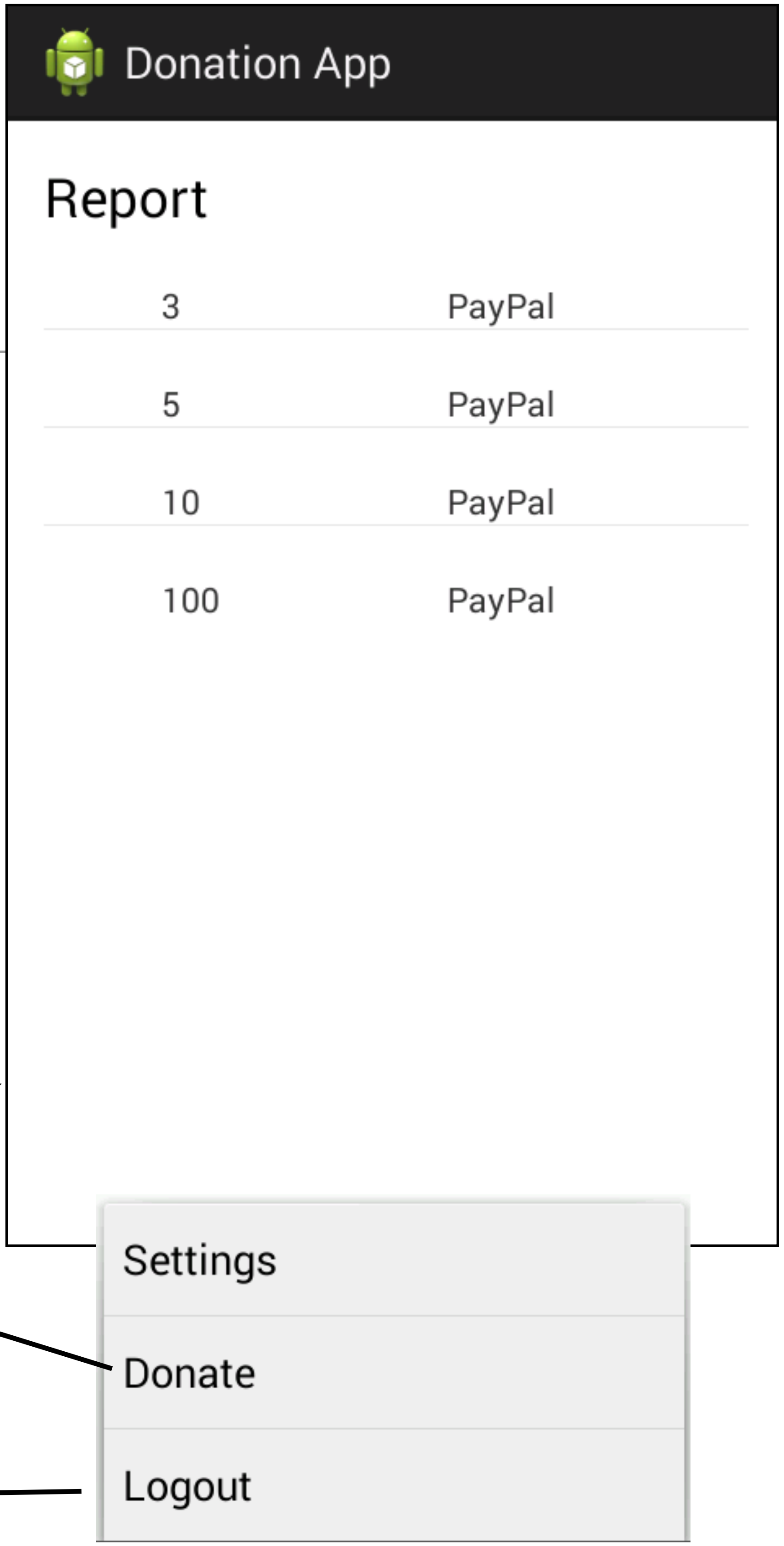

Donation

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

Exercise 7 Solution

strings.xml

```
<string name="menuLogout">Logout</string>
```

---

donate.xml

report.xml

```
<item
    android:id="@+id/menuLogout"
    android:orderInCategory="100"
    android:title="@string/menuLogout"/>
```

Donate

```
@Override
public boolean onOptionsItemSelected(MenuItem item)
{
  switch (item.getItemId())
  {
    case R.id.menuReport : startActivity (new Intent(this, Report.class));
                           break;
    case R.id.menuLogout : startActivity (new Intent(this, Welcome.class));
                           break;
  }
  return true;
}
```

Report

```
@Override
public boolean onOptionsItemSelected(MenuItem item)
{
  switch (item.getItemId())
  {
    case R.id.menuDonate : startActivity (new Intent(this, Donate.class));
                           break;
    case R.id.menuLogout : startActivity (new Intent(this, Welcome.class));
                           break;
  }
  return true;
}
```

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.

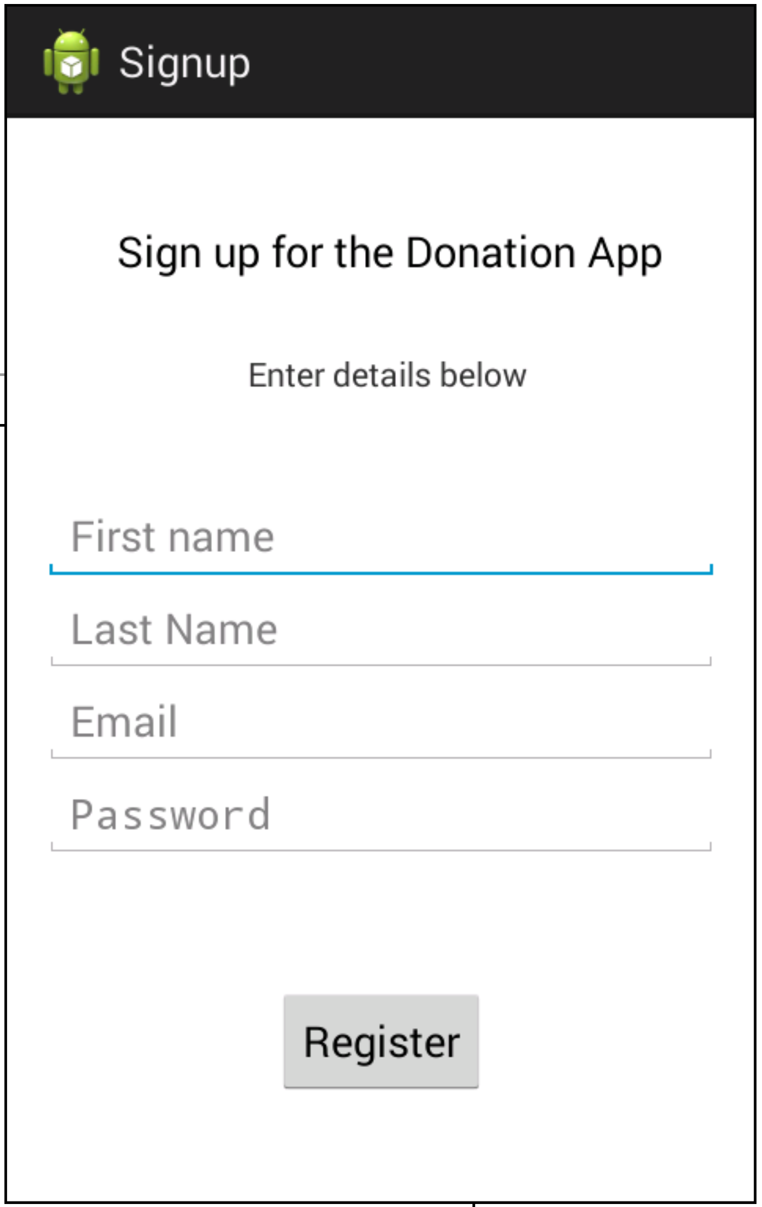
Exercise 8 Solution

```
public class User
{
  public String firstName;
  public String lastName;
  public String email;
  public String password;

  public User(String firstName, String lastName, String email, String password)
  {
    this.firstName = firstName;
    this.lastName = lastName;
    this.email = email;
    this.password = password;
  }
}
```

Exercise 8 Solution

```
public class DonationApp extends Application
{
  public final int       target       = 10000;
  public int             totalDonated = 0;

  public List <User>     users        = new ArrayList<User>();
  public List <Donation> donations    = new ArrayList<Donation>();

  public void newUser(User user)
  {
    users.add(user);
  }

  //…

}
```

Exercise 8 Solution


Signup
Sign up for the Donation App
Enter details below
First name
Last Name
Email
Password
Register

```java
public class Signup extends Activity
{
  @Override
  protected void onCreate(Bundle savedInstanceState)
  {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_signup);
  }

  public void registerPressed (View view)
  {
    TextView firstName = (TextView)  findViewById(R.id.firstName);
    TextView lastName  = (TextView)  findViewById(R.id.lastName);
    TextView email     = (TextView)  findViewById(R.id.Email);
    TextView password  = (TextView)  findViewById(R.id.Password);

    User user = new User (firstName.getText().toString(), lastName.getText().toString(),
                              email.getText().toString(), password.getText().toString());

    DonationApp app = (DonationApp) getApplication();
    app.newUser(user);

    startActivity (new Intent(this, Welcome.class));
  }
}
```

Exercise 9

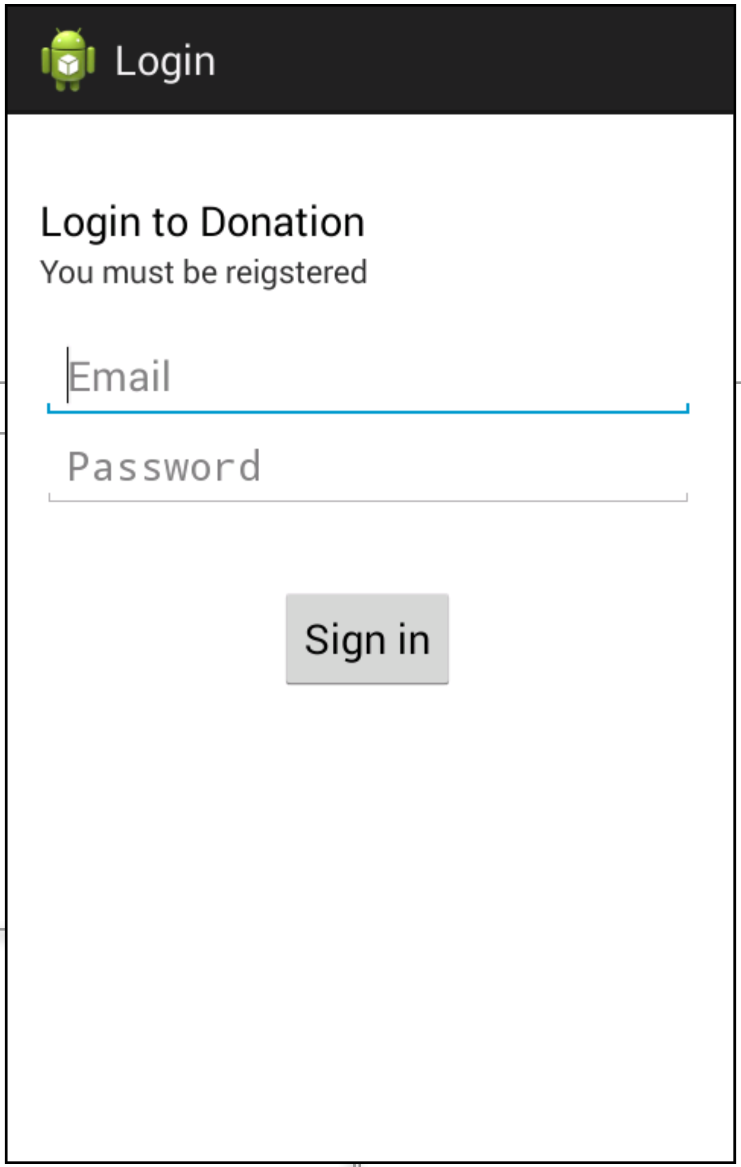
- Implement the Login activity, to now only let users in to Donate if they are registered (i.e. a matching email + password in the list of users maintained by DonationApp)

Exercise 9 Solution

```
public class DonationApp extends Application
{
  public final int       target       = 10000;
  public int             totalDonated = 0;

  public List <User>     users        = new ArrayList<User>();
  public List <Donation> donations    = new ArrayList<Donation>();

  public void newUser(User user)
  {
    users.add(user);
  }

  public boolean validUser (String email, String password)
  {
    for (User user : users)
    {
      if (user.email.equals(email) && user.password.equals(password))
      {
        return true;
      }
    }
    return false;
  }


  //…

}
```

Exercise 9 Solution

```
public class Login extends Activity
{
  @Override
  protected void onCreate(Bundle savedInstanceState)
  {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_login);
  }

  public void signinPressed (View view)
  {
    DonationApp app = (DonationApp) getApplication();

    TextView email     = (TextView)  findViewById(R.id.loginEmail);
    TextView password  = (TextView)  findViewById(R.id.loginPassword);

    if (app.validUser(email.getText().toString(), password.getText().toString()))
    {
      startActivity (new Intent(this, Donate.class));
    }
    else
    {
      Toast toast = Toast.makeText(this, "Invalid Credentials", Toast.LENGTH_SHORT);
      toast.show();
    }
  }
}
```

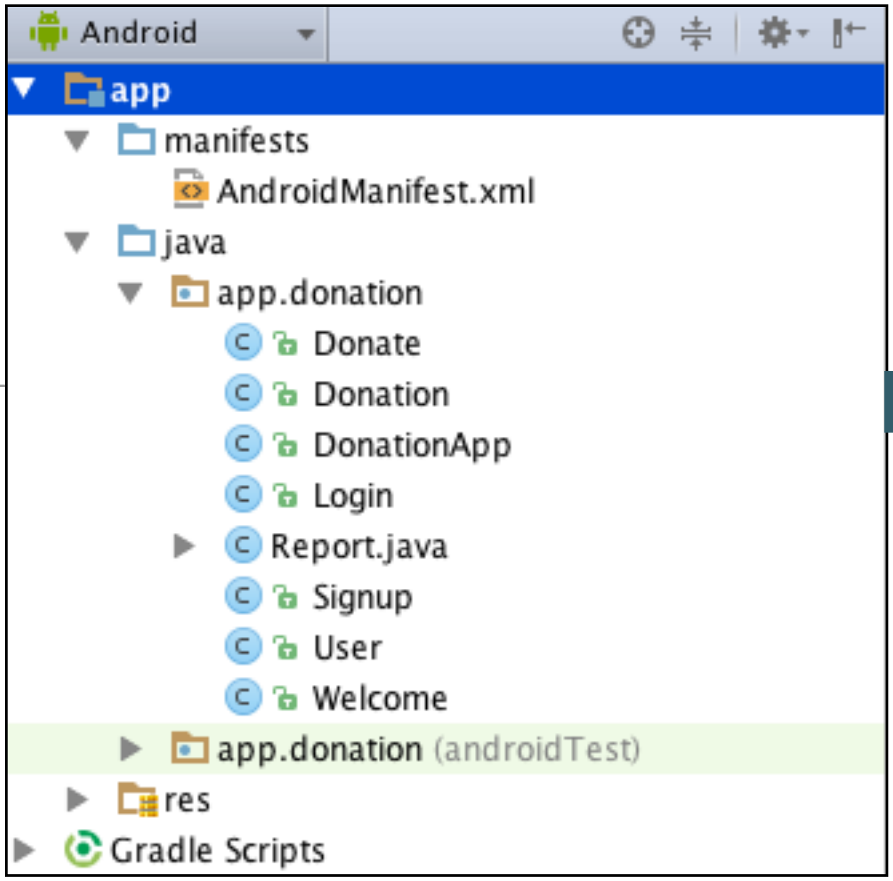


Login

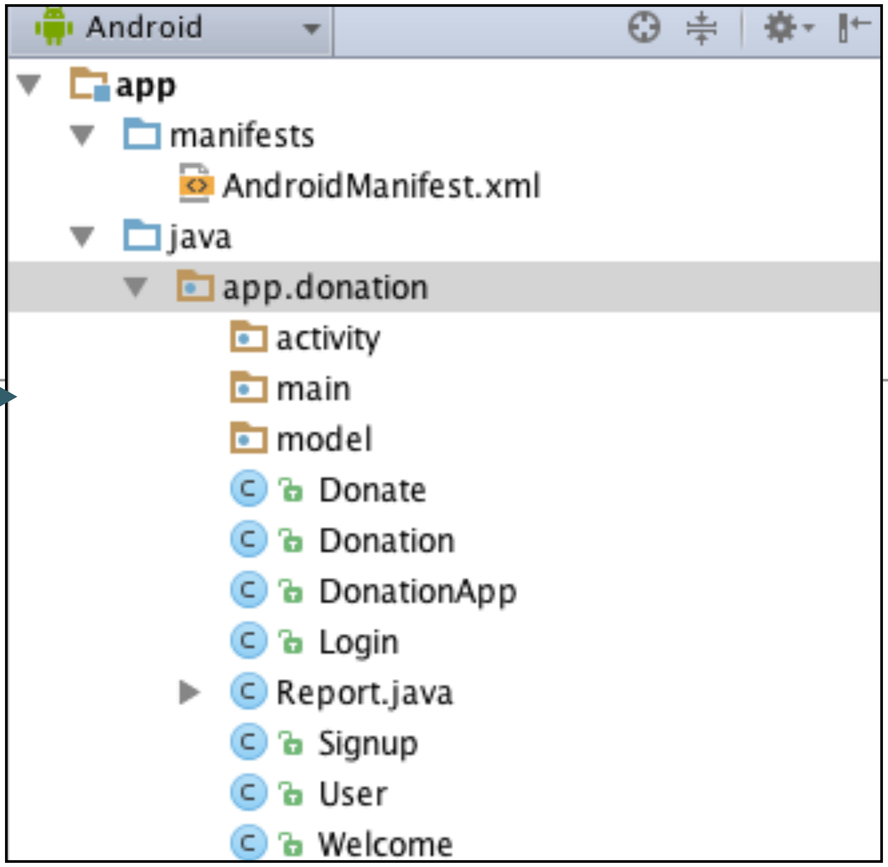
Login to Donation

You must be reigstered

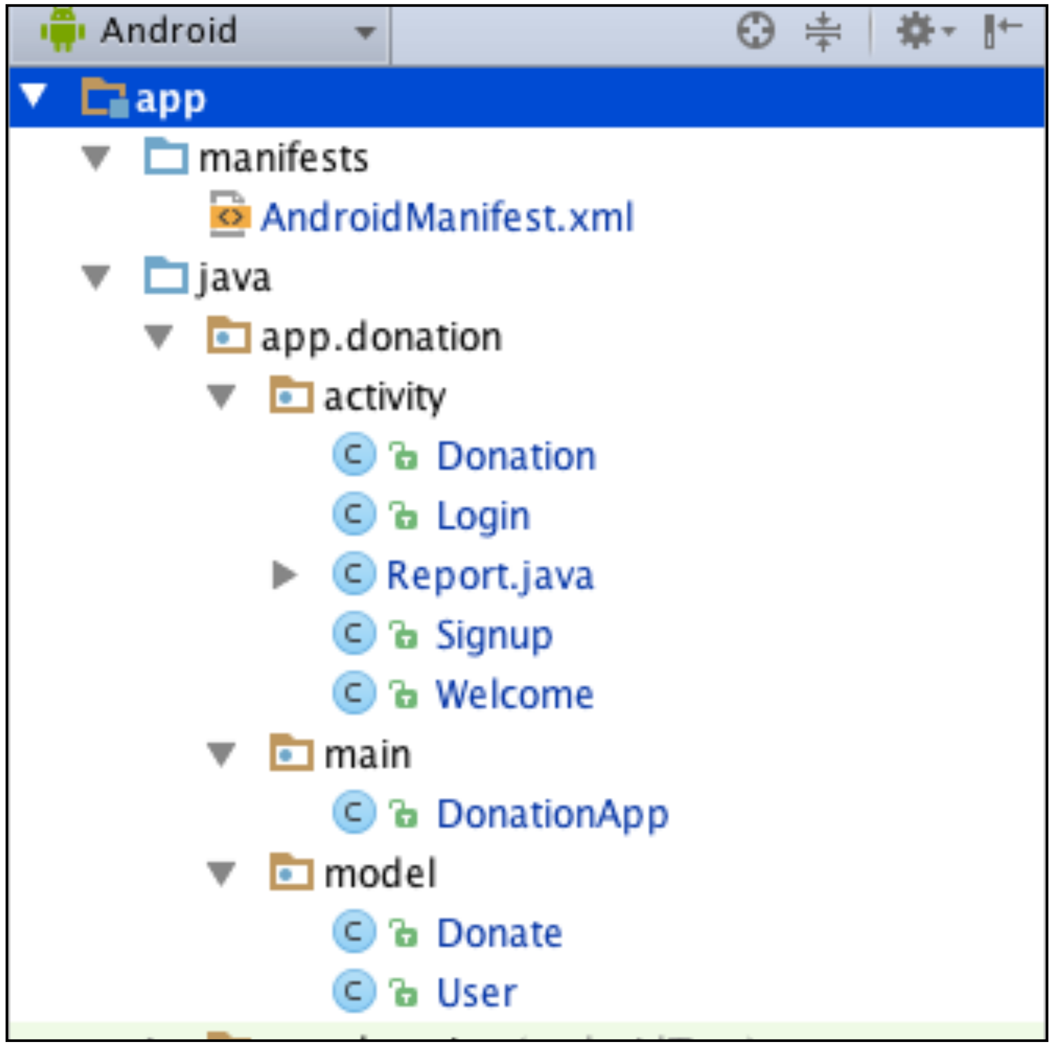
Refactor Package Structure



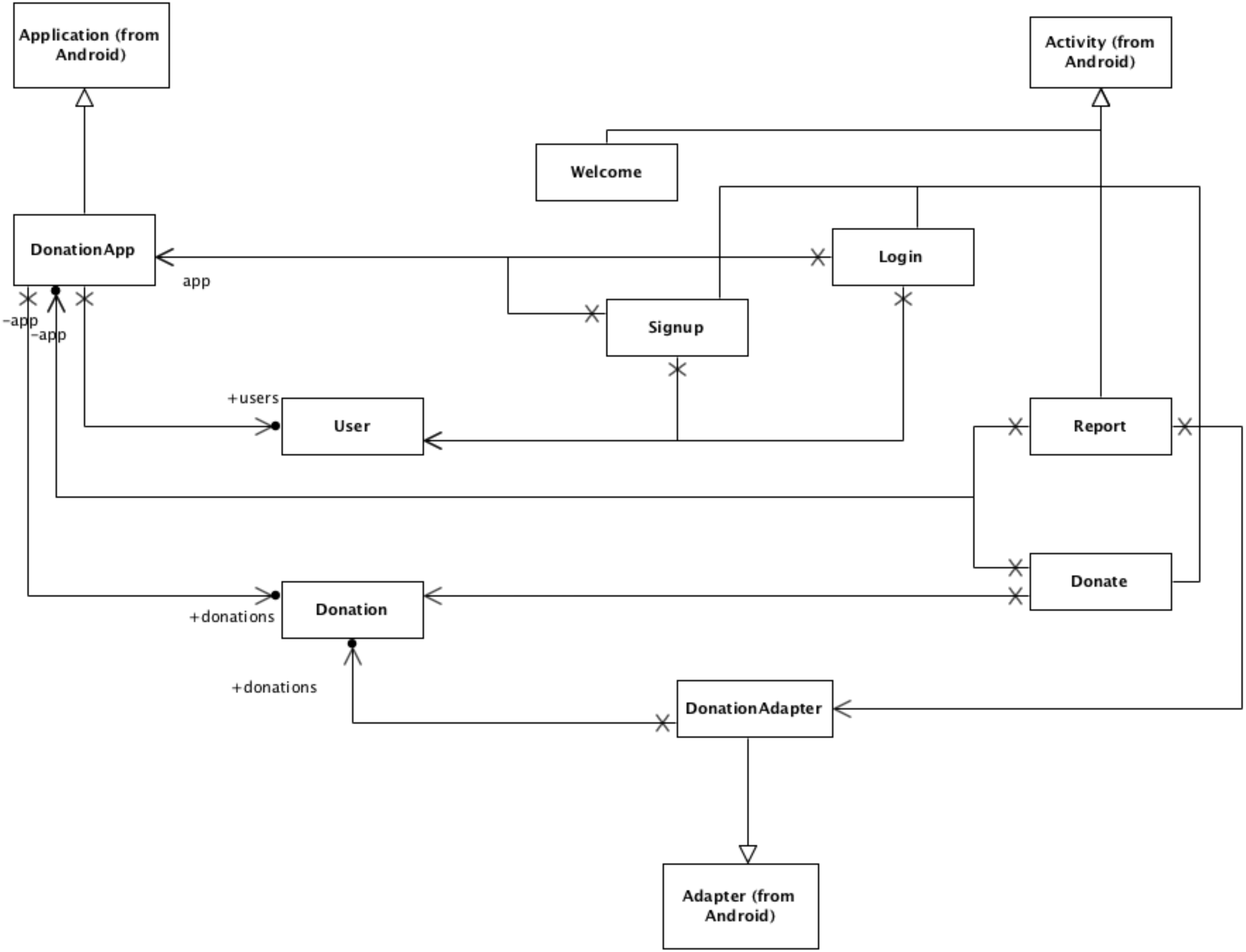
- app
  - manifests
    - AndroidManifest.xml
  - java
    - app.donation
      - Donate
      - Donation
      - DonationApp
      - Login
      - Report.java
      - Signup
      - User
      - Welcome
    - app.donation (androidTest)
  - res
- Gradle Scripts



- app
  - manifests
    - AndroidManifest.xml
  - java
    - app.donation
      - activity
      - main
      - model
      - Donate
      - Donation
      - DonationApp
      - Login
      - Report.java
      - Signup
      - User
      - Welcome



- app
  - manifests
    - AndroidManifest.xml
  - java
    - app.donation
      - activity
        - Donation
        - Login
        - Report.java
        - Signup
        - Welcome
      - main
        - DonationApp
      - model
        - Donate
        - User


Application (from Android)
Activity (from Android)
Welcome
DonationApp
Login
Signup
app
-app
-app
+users
User
Report
Donate
Donation
+donations
+donations
DonationAdapter
Adapter (from Android)

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