Mobile Application Development

Produced by

David Drohan (ddrohan@wit.ie)

Department of Computing & Mathematics
Waterford Institute of Technology
http://www.wit.ie

Waterford Institute *of* Technology
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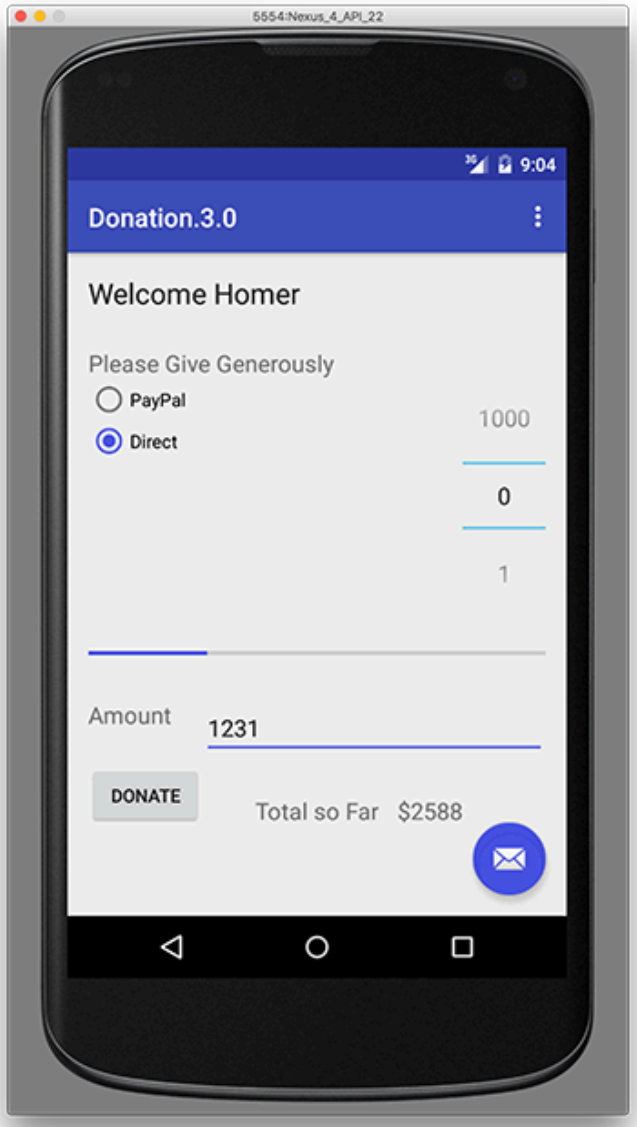
Activities & App Navigation

Agenda & Goals

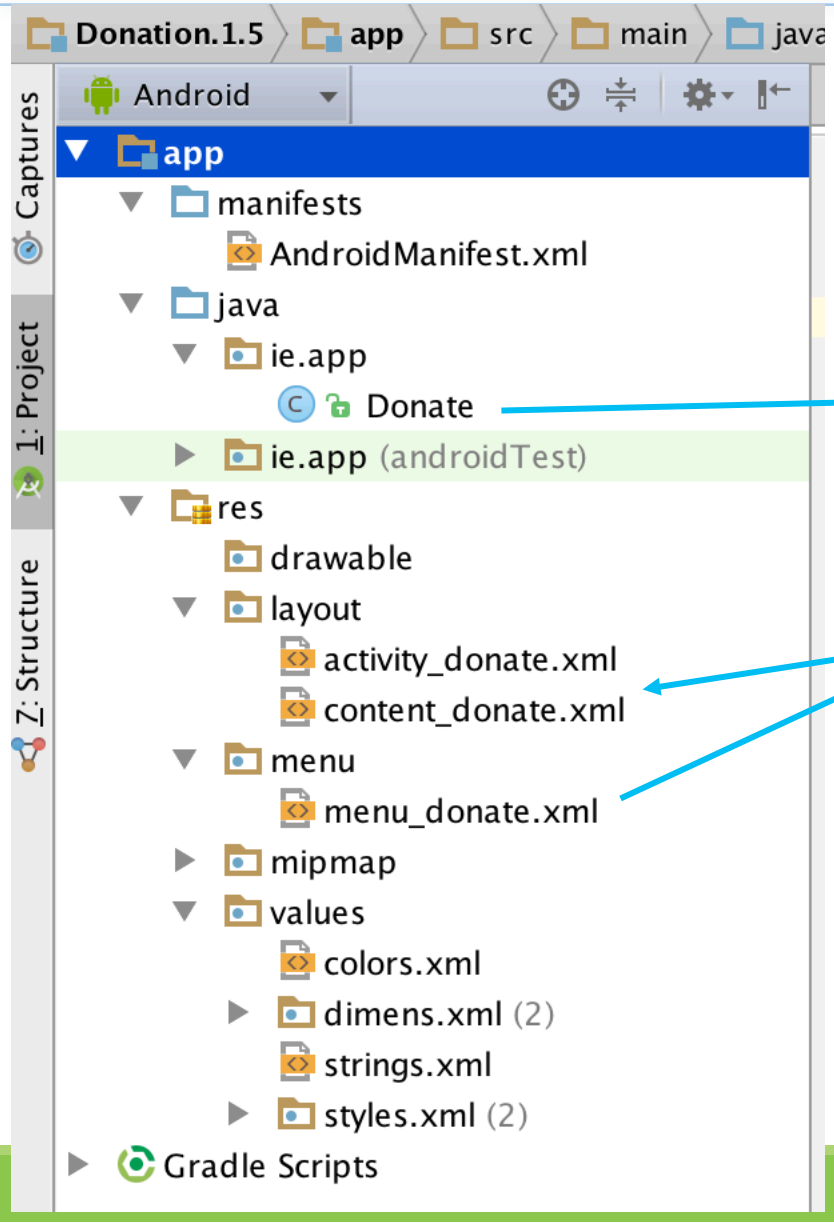
- Using Menu Navigation and MenuInflators
- Switching from one Activity to another using Intents
- Creating and using basic ArrayAdapters and ListViews

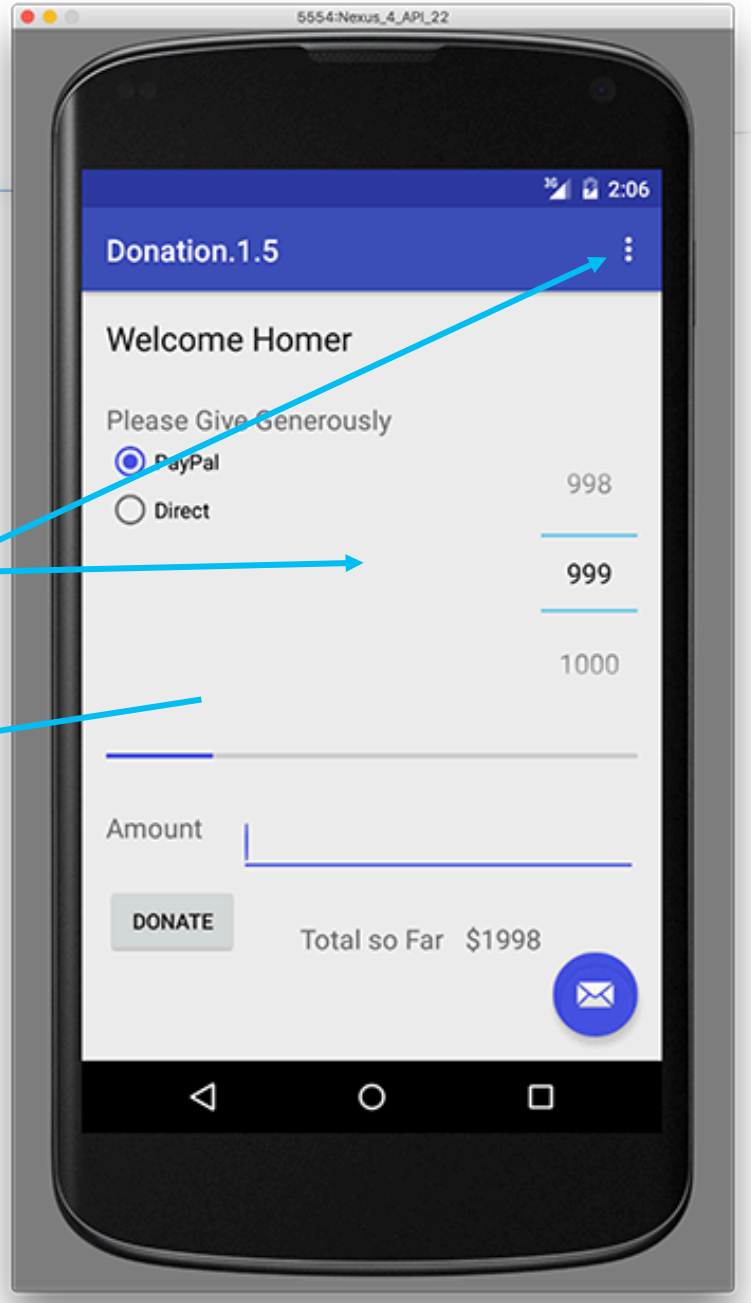
Case Study

- *Donation* – an Android App to keep track of donations made to '*Homers Presidential Campaign* '.
- App Features
  - Accept donation via number picker or typed amount
  - Keep a running total of donations
  - Display report on donation amounts and types
  - Display running total on progress bar



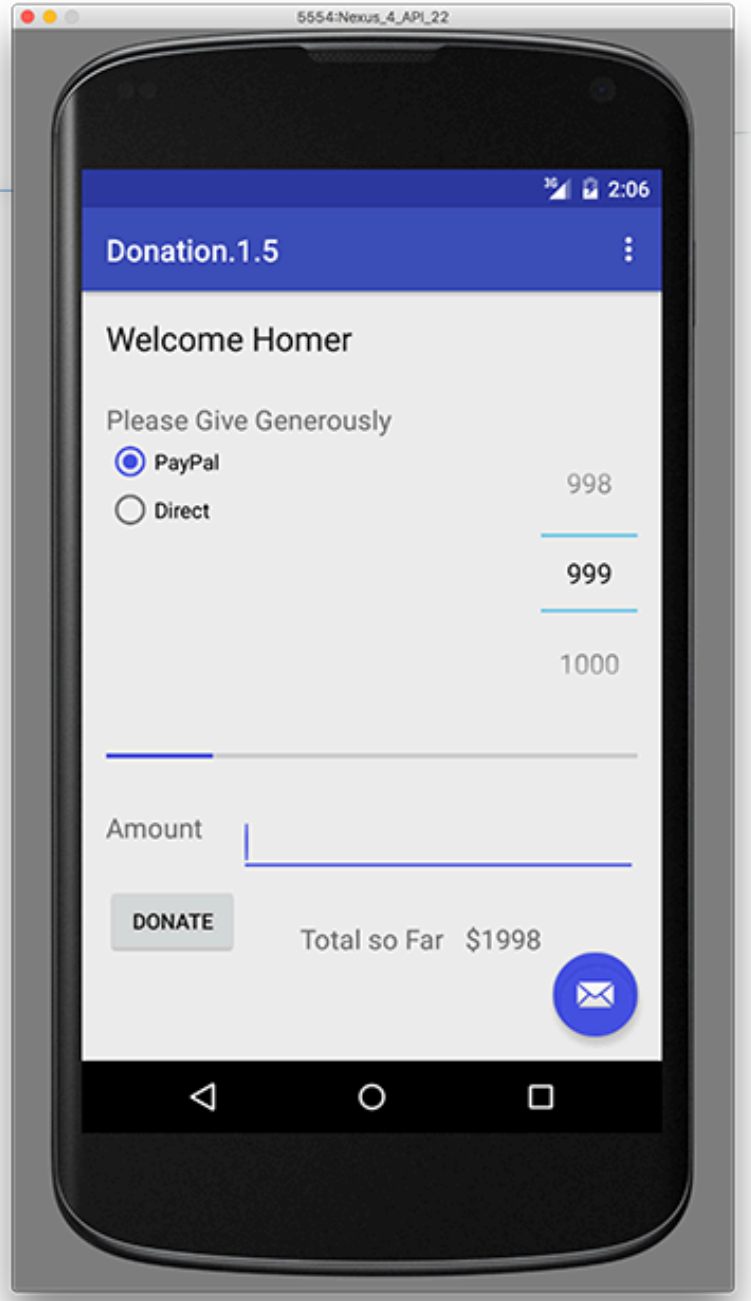
Case Study so far – Donation.1.5 *





Case Study so far – Donation.1.5

```
public class Donate extends AppCompatActivity {

    private Button          donateButton;
    private RadioGroup      paymentMethod;
    private ProgressBar     progressBar;
    private NumberPicker    amountPicker;
    private EditText        amountText;
    private TextView        amountTotal;

    private int             totalDonated = 0;
    private boolean         targetAchieved = false;

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

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {...}

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {...}
```



Donate button event handler

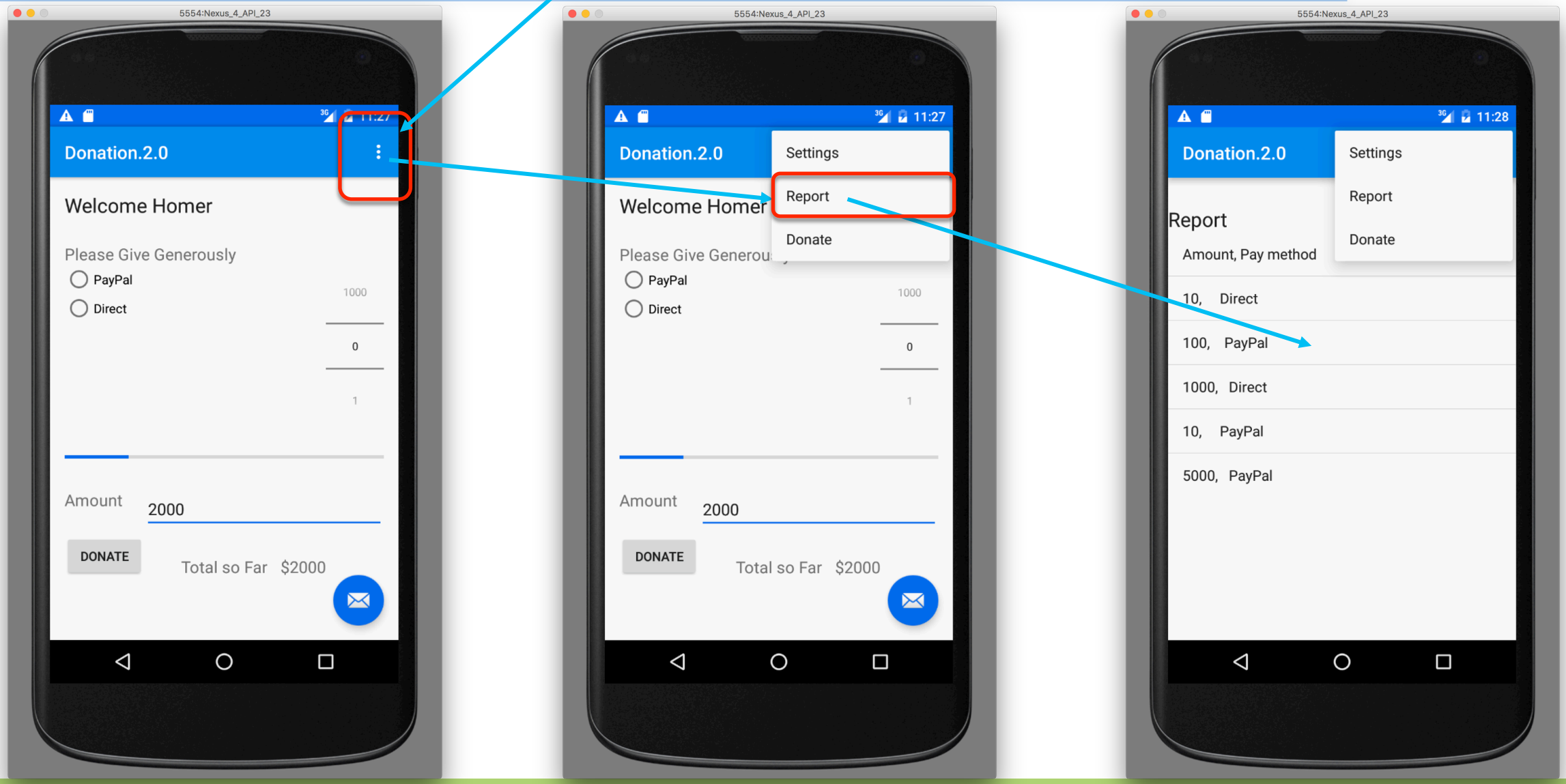
```
public void donateButtonPressed (View view)
{
    String method = paymentMethod.getCheckedRadioButtonId() == R.id.PayPal ? "PayPal" : "Direct";

    int donatedAmount =  amountPicker.getValue();
    if (donatedAmount == 0)
    {
        String text = amountText.getText().toString();
        if (!text.equals(""))
            donatedAmount = Integer.parseInt(text);
    }

    if (!targetAchieved)
    {
        totalDonated  = totalDonated + donatedAmount;
        targetAchieved = totalDonated >= 10000;
        progressBar.setProgress(totalDonated);
        String totalDonatedStr = "$" + totalDonated;
        amountTotal.setText(totalDonatedStr);
    }
    else
    {
        Toast toast = Toast.makeText(this, "Target Exceeded!", Toast.LENGTH_SHORT);
        toast.show();
    }

    Log.v("Donate", amountPicker.getValue() + " donated by " +  method + "\nCurrent total " + totalDonated);
}
```

Donation.2.0

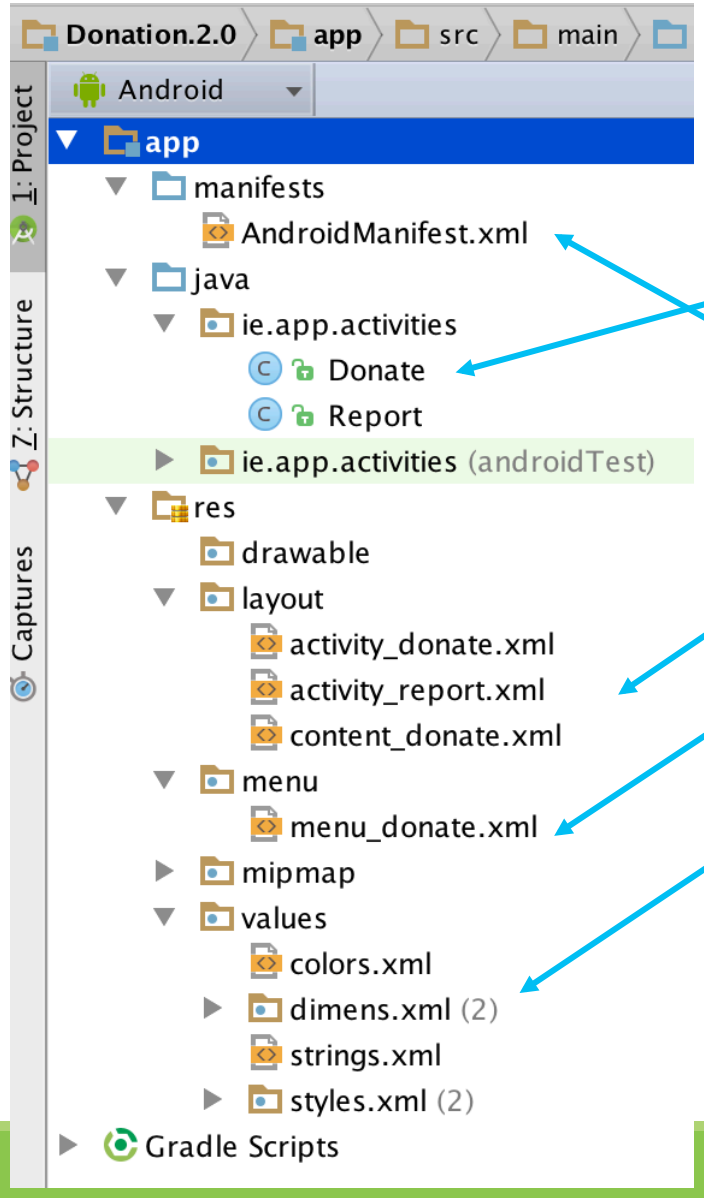
Using Menus & Intents

Donation 2.0

User Selects Menu



Donation 2.0 – Project Structure



- 2 java source files
- 3 xml layouts
- 1 xml menu
- 6 xml files for resources
- 1 xml 'configuration' file

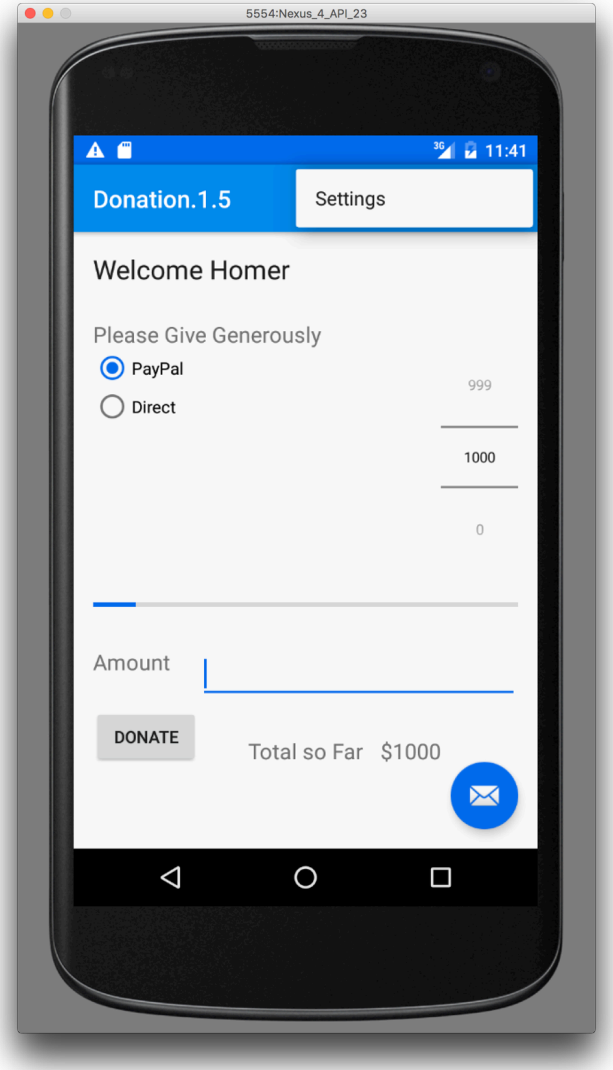
Using Menus
Part 1

Menus

- Menus are a common user interface component in many types of applications.
- To provide a familiar and consistent user experience, you should use the Menu APIs to present user actions and other options in your activities.
- Beginning with Android 3.0 (API 11), Android-powered devices are no longer required to provide a dedicated *Menu* button
  - instead you provide an **action bar** to present common user actions.

Options Menu & Action Bar *

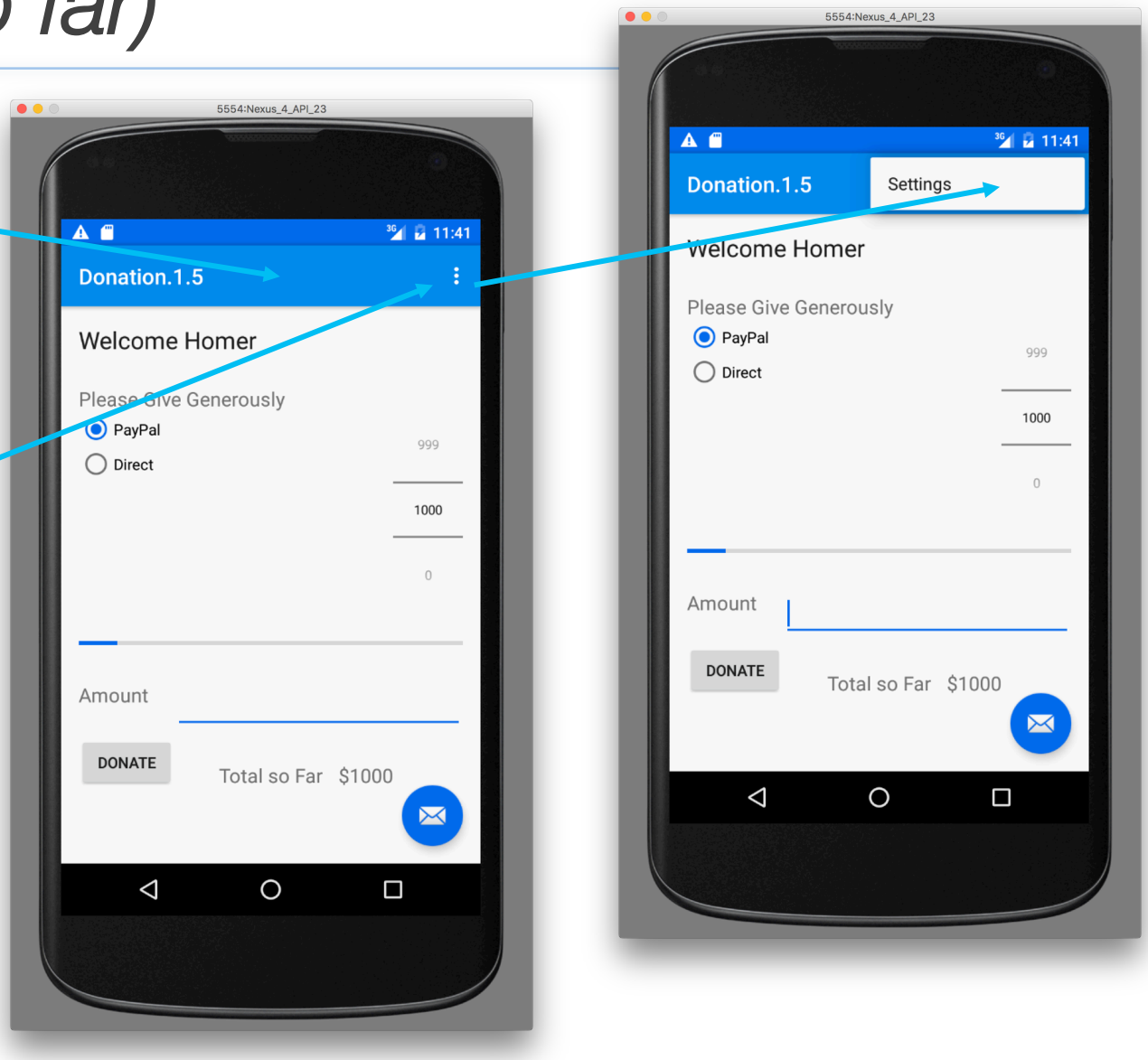
- The options menu is the primary collection of menu items for an activity.
  - It's where you should place actions that have a global impact on the app, such as “Donate”, “Report” and “Settings” etc.
- If you're developing for Android 2.3 or lower, users can reveal the options menu panel by pressing the *Menu* button.
- On Android 3.0 and higher, items from the options menu are presented by the action bar as a combination of on-screen action items and overflow options.



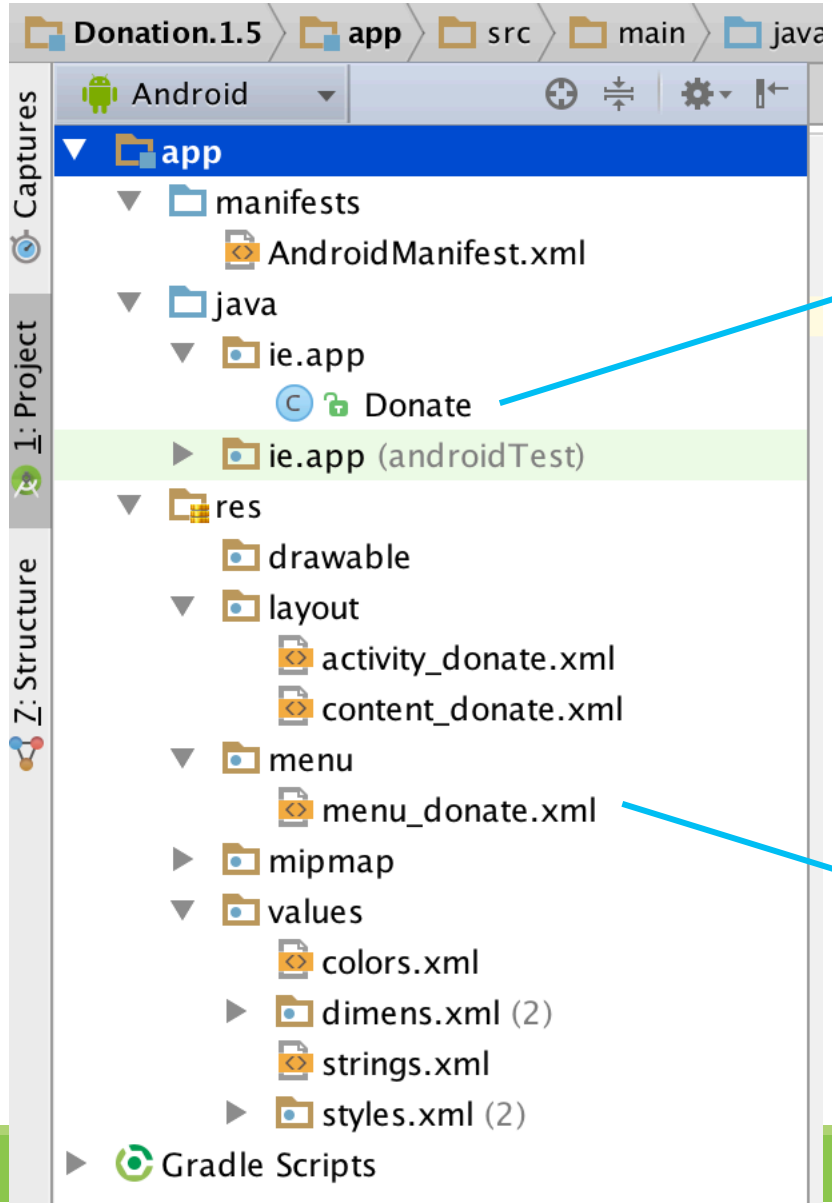
Menus in *Donation (so far)* *

Action Bar

Pressing the “Menu” button on the emulator brings up a menu with the following entry



Menus in *Donation (so far)*



Menu Load

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

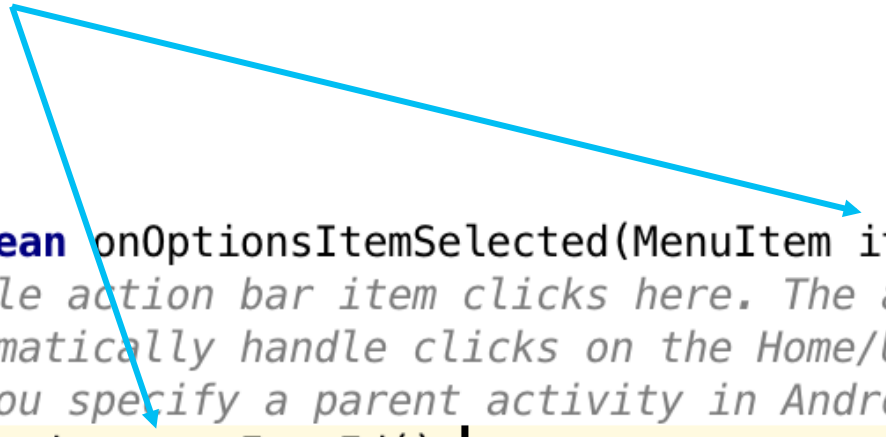
inflate this resource as a 'Menu' (creates the menu)

Menu Specification

```
<menu xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools" tools:context=".Donate">

    <item android:id="@+id/action_settings"
        android:title="Settings"
        android:orderInCategory="100"
        app:showAsAction="never" />
</menu>
```

Donation 1.5 Menu Event Handler

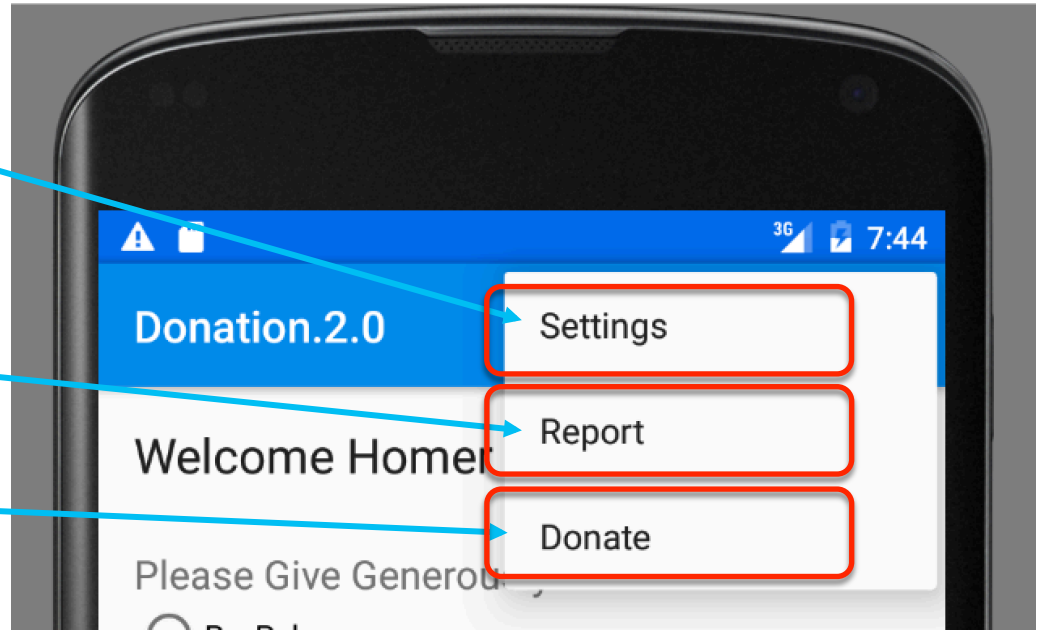
Check which ‘menu item’ was selected (by id)



```
@Override
public boolean onOptionsItemSelected(MenuItem item) {
    // Handle action bar item clicks here. The action bar will
    // automatically handle clicks on the Home/Up button, so long
    // as you specify a parent activity in AndroidManifest.xml.
    int id = item.getItemId();

    //noinspection SimplifiableIfStatement
    if (id == R.id.action_settings) {
        return true;
    }

    return super.onOptionsItemSelected(item);
}
```

Donation 2.0 'New' Menu Item(s) *

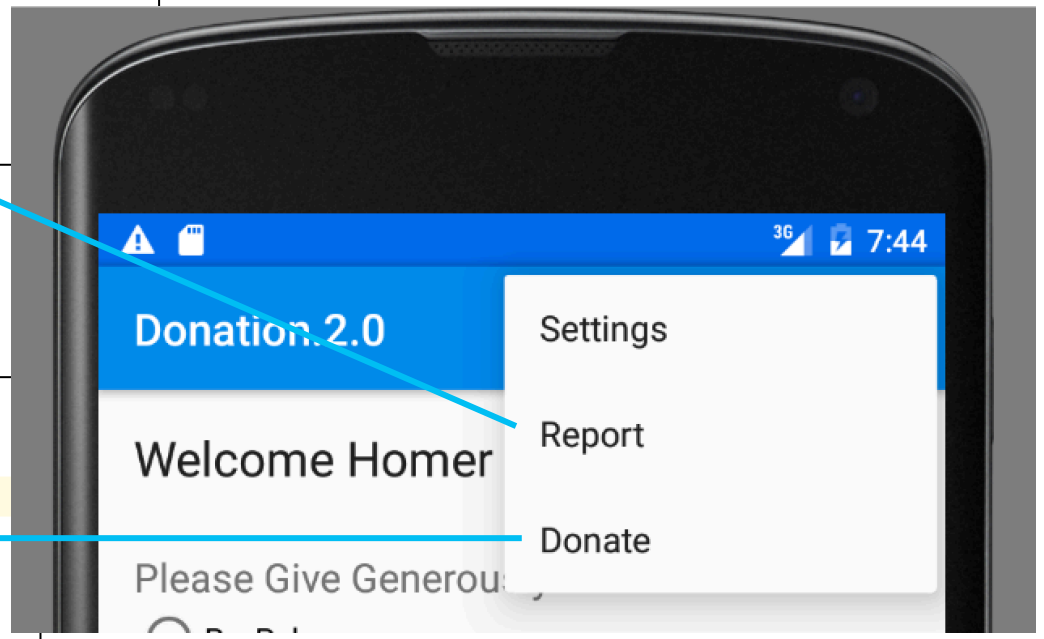
```
<menu xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools" tools:context=".Donate">

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

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

    <item
        android:id="@+id/menuDonate"
        android:orderInCategory="100"
        android:title="Donate"
        app:showAsAction="never"/>
</menu>
```



Donation 2.0 'New' Menu Event Handler(s)

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

Donate.java




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

Report.java

Using Intents

Recap on Android Components

- Three of the core components of an application — activities, services, and broadcast receivers — are activated through messages, called *intents*
- In this section we'll look at using intents to start other activities, allowing us to 'switch between screens'
- The intent itself, an Intent object, is a passive data structure holding
  - an abstract description of an operation to be performed, or
  - a description of something that has happened and is being announced (broadcasts)

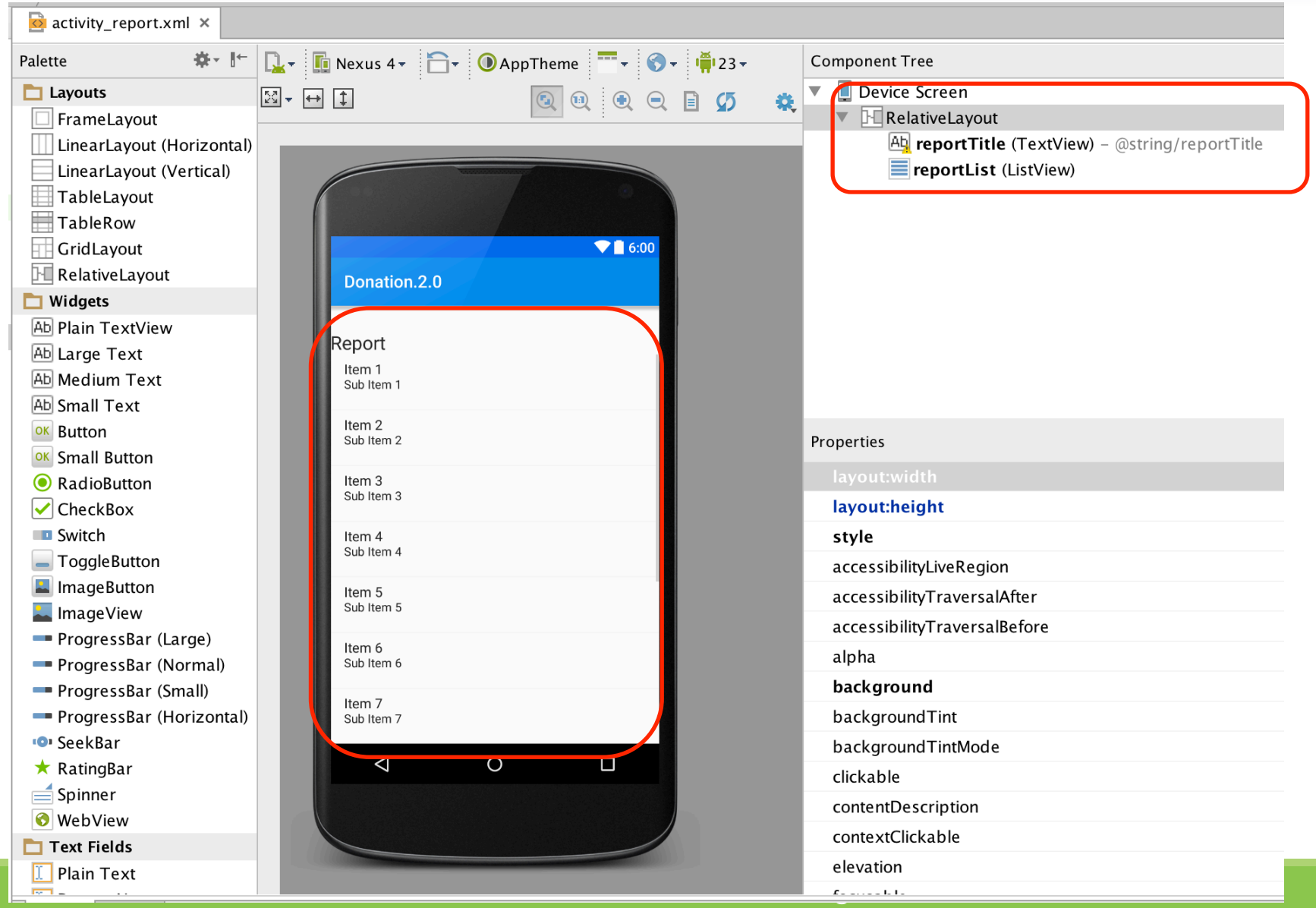
Switching Activities: General Approach

- Switch between Activities with Intents when
  - Main screen has buttons and/or menus to navigate to other Activities (your intent)
  - Return to original screen with “back” button (system intent)
- Syntax required to start new Activity
  - Java

```
Intent goToActivity = new Intent(this,OtherActivity.class);
startActivity(goToActivity);
```

  - XML
    - Requires an entry in AndroidManifest.xml (runtime error otherwise!)

Donation 2.0 - Report Layout *

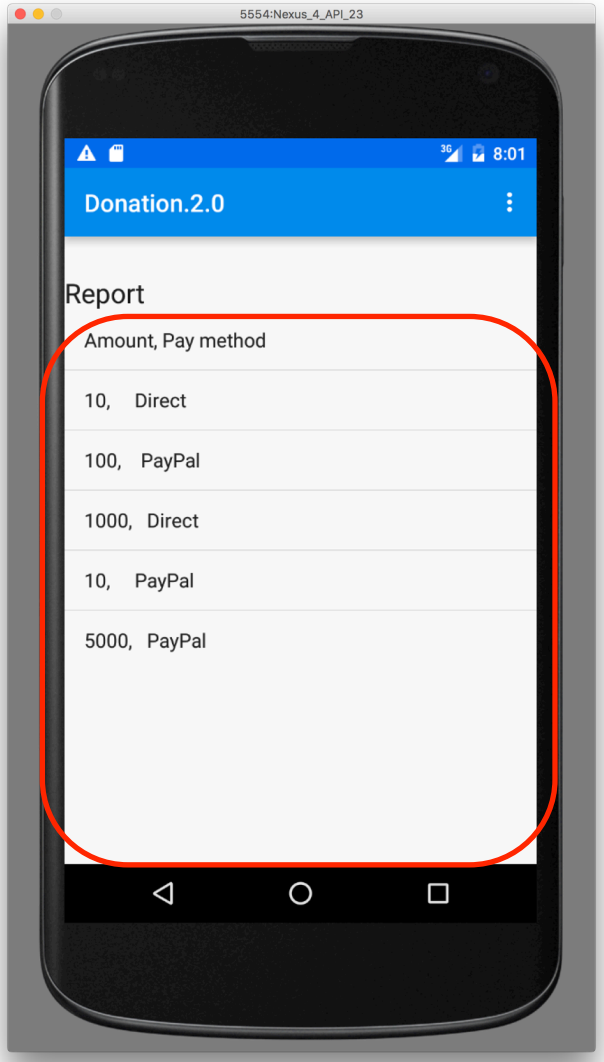


We will cover ListViews in more detail later on

Donation 2.0 – activity_report.xml *

activity_report.xml

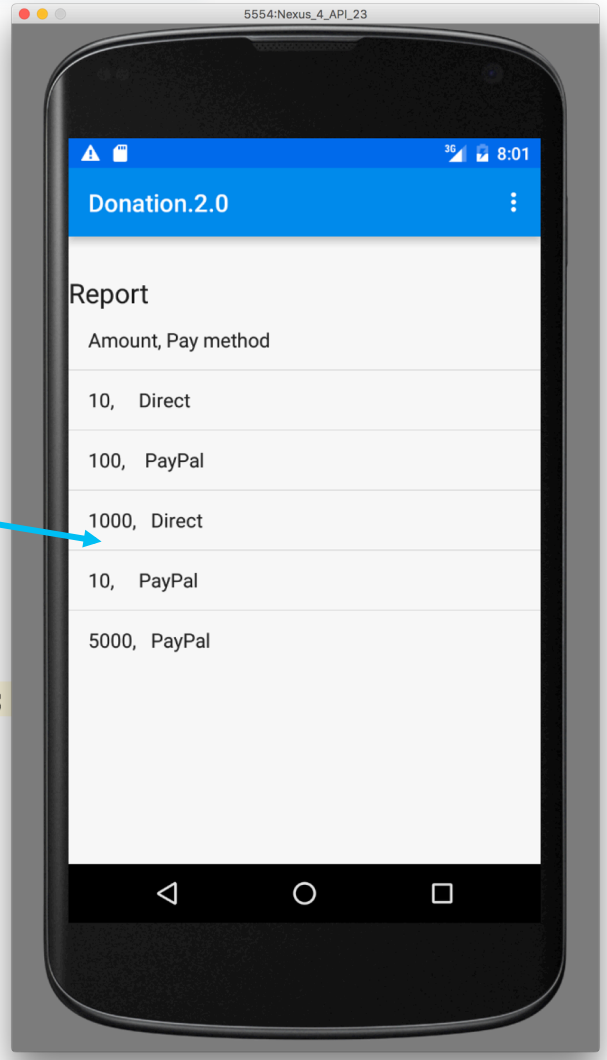
```
1  <?xml version="1.0" encoding="utf-8"?>
2  <RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
3      android:orientation="vertical" android:layout_width="match_parent"
4      android:layout_height="match_parent">
5
6      <TextView
7          android:layout_width="wrap_content"
8          android:layout_height="wrap_content"
9          android:textAppearance="?android:attr/textAppearanceLarge"
10         android:text="Report"
11         android:id="@+id/reportTitle"
12         android:layout_marginLeft="0dp"
13         android:layout_marginTop="31dp"
14         android:layout_alignParentTop="true"
15         android:layout_alignParentStart="true"
16         android:layout_alignParentEnd="true" />
17
18     <ListView
19         android:layout_width="wrap_content"
20         android:layout_height="wrap_content"
21         android:id="@+id/reportList"
22         android:layout_below="@+id/reportTitle"
23         android:layout_alignParentStart="true" />
24 </RelativeLayout>
```



Donation 2.0 - Report Activity *

```
public class Report extends AppCompatActivity
{
    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);
    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {...}

    @Override
    public boolean onOptionsItemSelected(MenuItem item)
    {...}
}
```

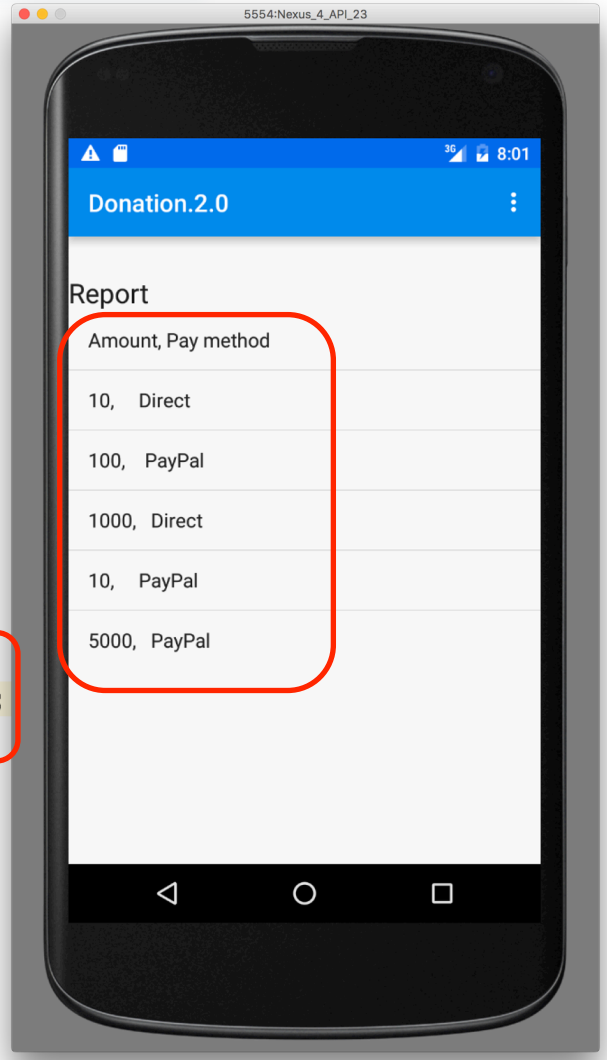
Initially, Hardcoded values



Donation 2.0 - Report Activity

```
public class Report extends AppCompatActivity
{
    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);
    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {...}

    @Override
    public boolean onOptionsItemSelected(MenuItem item)
    {...}
}
```

Using an Adapter to populate the ListView
(more on this in next section)



Filling an Adapter View with Data

- You can populate an AdapterView such as ListView or GridView by binding the AdapterView instance to an Adapter, which retrieves data from an external source and creates a View that represents each data entry.

```
ArrayAdapter<String> adapter = new ArrayAdapter<String>(this,
                                                        android.R.layout.simple_list_item_1,
                                                        numbers);
```

- The arguments for this constructor are:
  - Your app Context
  - The layout that contains a TextView for each string in the array
  - The string array (*numbers*)
- Then simply call setAdapter() on your ListView:

```
listView = (ListView) findViewById(R.id.reportList);
listView.setAdapter(adapter);
```

Donation.2.0

Summary

- We investigated using Menus for Navigation
- We saw how to Switch from one Activity to another using Intents
- And we had a quick look at creating and using basic ArrayAdapters and ListViews to display data in a list

Questions?


Thanks!