

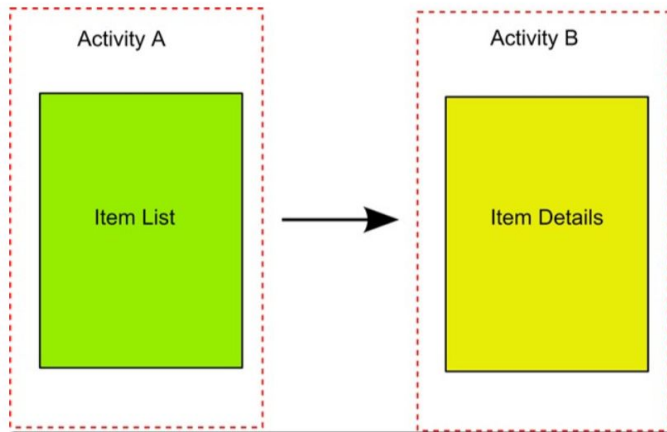
Intent

...

Lecture 6

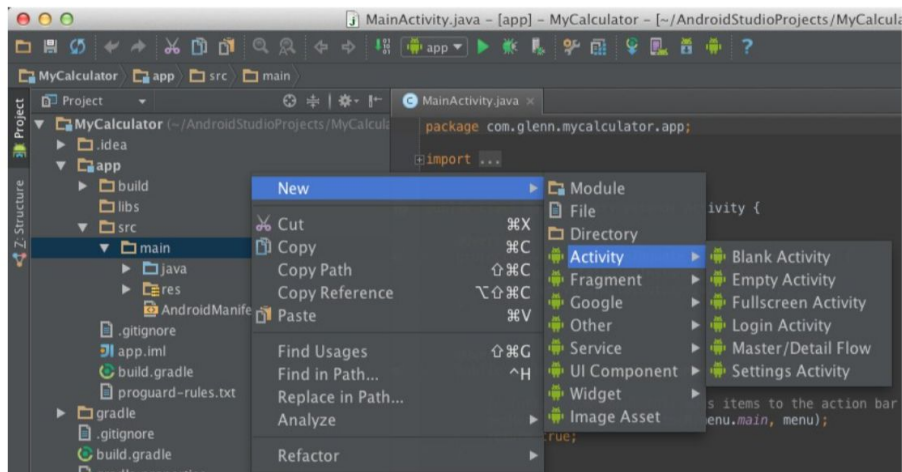
Multiple Activities

- Many apps have **multiple activities**.
 - Example: In an address book app, the main activity is a list of contacts, and clicking on a contact goes to another activity for viewing details.
 - An activity A can launch another activity B in response to an event.
 - The activity A can pass data to B.
 - The second activity B can send data back to A when it is done.



Adding an Activity

- in Android Studio, right click "app" at left: **New -> Activity**
 - creates a new **.XML file** in **res/layouts**
 - creates a new **.java class** in **src/java**
 - adds information to **AndroidManifest.xml** about the activity (without this information, the app will not allow the activity)



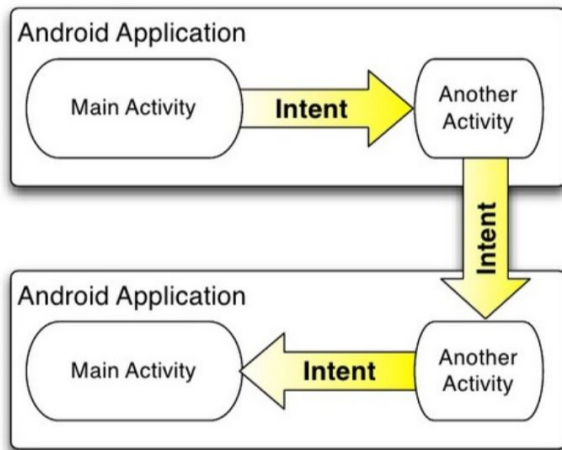
Activities in AndroidManifest.xml

- Every activity has an entry in project's **AndroidManifest.xml**, added automatically by Android Studio:

```
1  <!-- AndroidManifest.xml -->
2  <manifest ...>
3      <application ...>
4          <activity android:name=".MainActivity"
5                  android:label="@string/app_name" >
6              ...
7          </activity>
8
9          <activity android:name=".SecondActivity"
10                 android:label="@string/title_activity_second">
11              ...
12          </activity>
13      </application>
14  </manifest>
```

Intents

- **intent**: a bridge between activities;
a way for one activity to invoke another
 - the activity can be in the same app or in a different app
 - can store **extra data** to pass as "parameters" to that activity
 - second activity can "**return**" information back to the caller if needed



Uses of Intents

- to start an **activity** from another activity in the same app
 - e.g. Activity1 launches Activity2
- to start a **service**
 - seen later; a service is a long-running app with no GUI
 - system services include camera, phone dialer, music player, ...
- to **broadcast** a message to another app or service
 - other apps can listen and respond to messages
- types of intents:
 - **explicit**: Names a particular activity to launch. ("run Activity2")
 - **implicit**: Describes task to perform; one of many apps could potentially handle it. ("launch web browser")

Creating an Intent

- To launch another activity (usually in response to an event), create an Intent object and call `startActivity` with it:

```
Intent intent = new Intent(this, ActivityName.class);  
startActivity(intent);
```

- If you need to pass any parameters or data to the second activity, call `putExtra` on the intent.
 - It stores "extra" data as key/value pairs, not unlike a Map.

```
Intent intent = new Intent(this, ActivityName.class);  
intent.putExtra("name", value);  
intent.putExtra("name", value);  
startActivity(intent);
```

Extracting extra data

- In the second activity that was invoked, you can grab any extra data that was passed to it by the calling act.
 - You can access the Intent that spawned you by calling `getIntent`.
 - The Intent has methods like `getStringExtra`, `getIntExtra`, `getStringExtra`, etc. to extract any data that was stored inside the intent.

```
public class SecondActivity extends Activity {  
    ...  
    public void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.activity_second);  
        Intent intent = getIntent();  
        String extra = intent.getStringExtra("name");  
        ...  
    }  
}
```


Intent Methods

Method

```
getBooleanArrayExtra("name"), getBooleanExtra("name"),  
getByteArrayExtra("name"), getByteExtra("name"), getCharArrayExtra("name"),  
getCharExtra("name"), getDoubleArrayExtra("name"), getDoubleExtra("name"),  
getFloatArrayExtra("name"), getFloatExtra("name"),  
getIntArrayExtra("name"), getIntExtra("name"),  
getIntegerArrayListExtra("name"), getLongArrayExtra("name"),  
getLongExtra("name"), getParcelableArrayExtra("name"),  
getParcelableExtra("name"), getSerializableExtra("name"),  
getStringArrayExtra("name"), getStringArrayListExtra("name"),  
getStringExtra("name")
```

Description

return extra data of given type that is associated with the given key name

`getData()`

returns URI of associated data

`hasExtra("name")`

true if extra data exists with given key name

`putExtra("name", value);`

adds extra data with given key name

`putExtras(bundle);`

adds all key/value pairs from the given bundle/intent as extra data

`removeExtra("name");`

delete the given extra data

`replaceExtras(bundle);`

wipe out all extra data and replace it w/ data from given bundle/intent

`setData(uri);`

sets URI of associated data

`setFlags(flags);`

various flags and settings

Waiting for a result

- If calling activity wants to wait for a result from called activity:
 - Call **startActivityResult** rather than startActivity.
 - startActivityForResult requires you to pass a **unique ID** number to represent the action being performed.
 - By convention, you declare a final int constant with a value of your choice.
 - The call to startActivityForResult will not wait; it will return immediately.
 - Write an **onActivityResult** method that will be called when the second activity is done.
 - Check for your unique ID as was passed to startActivityForResult.
 - If you see your unique ID, you can ask the intent for any extra data.
 - **Modify the called activity** to send a result back.
 - Use its setResult and finish methods to end the called activity.

Sending back a result

- In the second activity that was invoked, send data back:
 - Need to create an Intent to go back.
 - Store any extra data in that intent; call setResult and finish.

```
public class SecondActivity extends Activity {  
    ...  
    public void myOnClick(View view) {  
        Intent intent = new Intent();  
        intent.putExtra("name", value);  
        setResult(RESULT_OK, intent);  
        finish();    // calls onDestroy  
    }  
}
```

Grabbing the result

```
public class FirstActivity extends Activity {
    private static final int REQ_CODE = 123;    // MUST be 0-65535

    public void myOnClick(View view) {
        Intent intent = getIntent(this, SecondActivity.class);
        startActivityForResult(intent, REQ_CODE);
    }

    protected void onActivityResult(int requestCode,
        int resultCode, Intent intent) {
        super.onActivityResult(requestCode, resultCode, intent);
        if (requestCode == REQ_CODE) {
            // came back from SecondActivity
            String data = intent.getStringExtra("name");
            Toast.makeText(this, "Got back: " + data,
                Toast.LENGTH_SHORT).show();
        }
    }
}
```

Implicit Intent

- **implicit intent:** One that launches another app, without naming that specific app, to handle a given type of request or action.
 - examples: invoke default browser; load music player to play a song

```
// make a phone call
```

```
Uri number = Uri.parse("tel:5551234");
```

```
Intent callIntent = new Intent(Intent.ACTION_DIAL, number);
```

```
// go to a web page in the default browser
```

```
Uri webpage = Uri.parse("http://www.stanford.edu/");
```

```
Intent webIntent = new Intent(Intent.ACTION_VIEW, webpage);
```

```
// open a map pointing at a given latitude/longitude (z=zoom)
```

```
Uri location = Uri.parse("geo:37.422219,-122.08364?z=14");
```

```
Intent mapIntent = new Intent(Intent.ACTION_VIEW, location);
```

Activities and Action Bar

- **action bar:** A top-level menu of actions in an activity.
 - replaces older "menu" button in past versions of Android
 - identifies current activity/app to user
 - make common actions prominent and available
 - make less common actions available through a drop-down menu
- If your activity is specified to have a "parent" activity on creation and in AndroidManifest.xml, you will have a **"back" button** to return to the calling activity.

