12

# Android Intents

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Notes are based on:

Android Developers
http://developer.android.com/index.html


# Intents

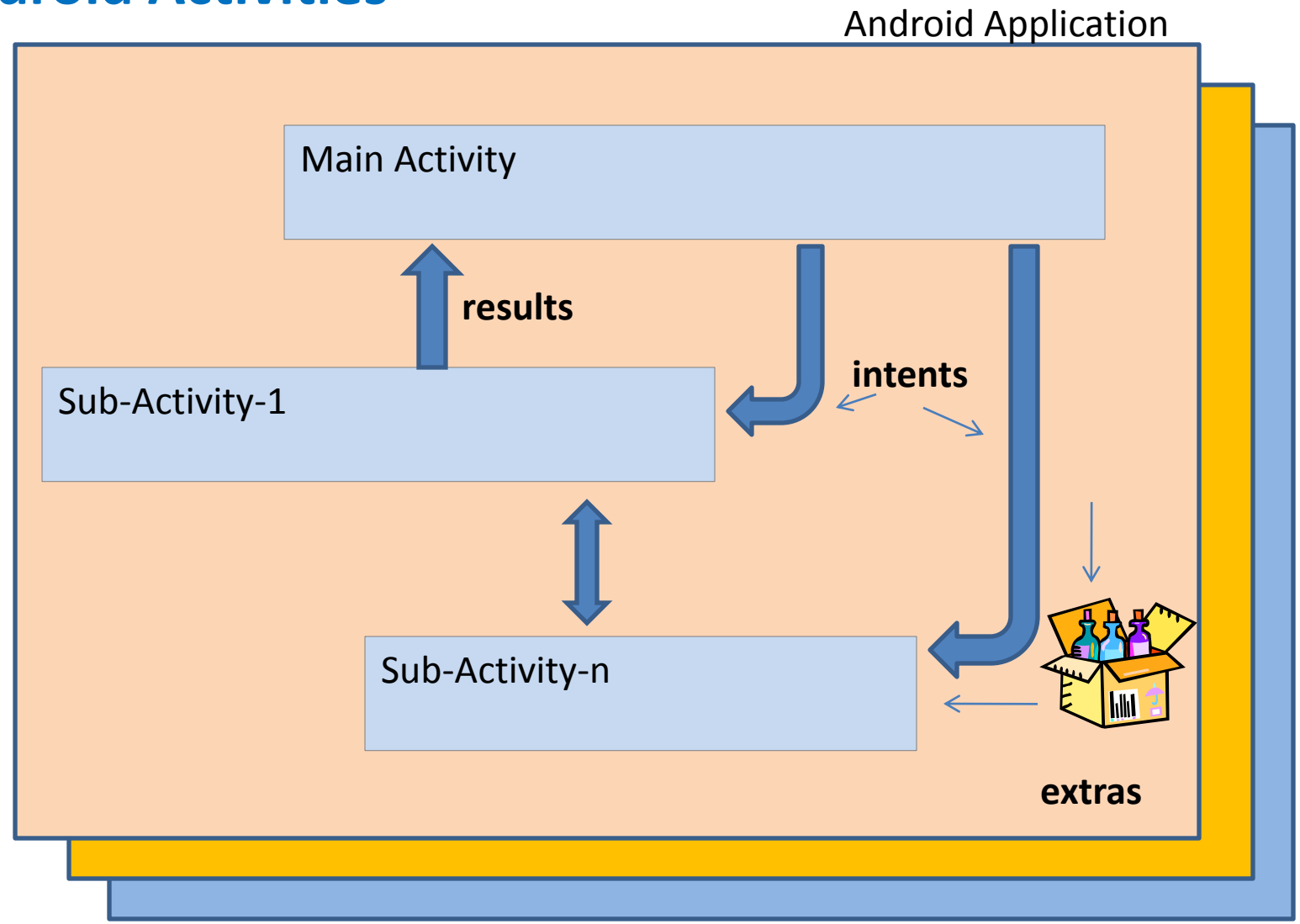
## Android Activities

An Android application could include any number of activities.

- An *activity* uses the *setContentView*(...) method to expose (usually) a single UI from which a number of actions could be performed.
- Activities are independent of each other; however they usually cooperate exchanging data and actions.
- Typically, one of the activities is designated as the first one (*main*) that should be presented to the user when the application is launched.
- Moving from one activity to another is accomplished by asking the current activity to execute an ***intent***.
- Activities interact with each other in an **asynchronous** mode.

# Intents

## Android Activities




# Intents

Taken from: http://code.google.com/android/reference/android/content/Intent.html

**Intents** are invoked using the following options

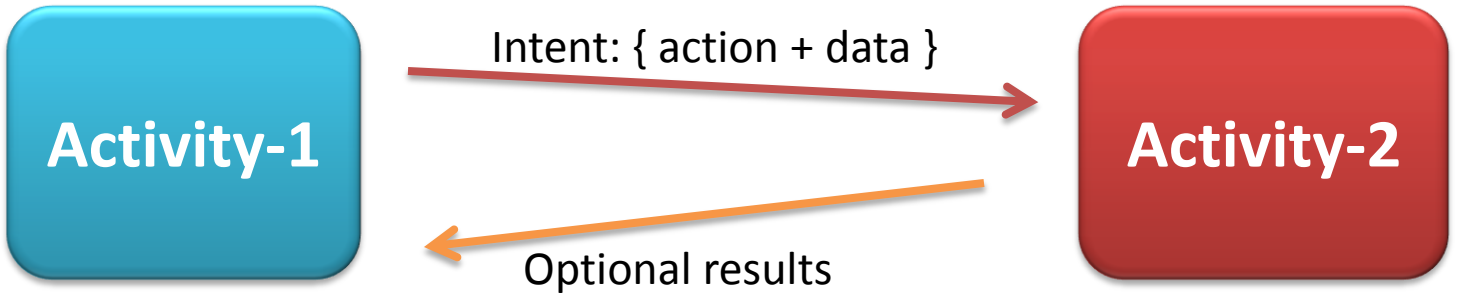
| | |
|---|---|
| ***startActivity*** **(intent)** | launches an *Activity* |
| ***sendBroadcast*** **(intent)** | sends an intent to any interested *BroadcastReceiver* components |
| ***startService*****(intent)** or ***bindService*****(intent, …)** | communicate with a background Service. |


# Intents

Taken from: http://code.google.com/android/reference/android/content/Intent.html

The main arguments of an Intent are:

1. **Action** The built-in action to be performed, such as `ACTION_VIEW`, `ACTION_EDIT`, `ACTION_MAIN`, … or *user-created-activity*
2. **Data** The primary data to operate on, such as a phone number to be called (expressed as a **Uri**).




# Intents

Taken from: http://code.google.com/android/reference/android/content/Intent.html

Typically an intent is called as follows:

```
Intent  myActivity = new Intent (action, data);

startActivity (myActivity);
```

Built-in or user-created activity

Primary data (as an URI)
tel://
http://
sendto://


# Intents

Taken from: http://code.google.com/android/reference/android/content/Intent.html

**Examples** of **action/data** pairs are:

**ACTION_DIAL** ***tel:123***
Display the phone dialer with the given number filled in.

**ACTION_VIEW** ***http://www.google.com***
Show Google page in a browser view. Note how the VIEW action does what is considered the most reasonable thing for a particular URI.

**ACTION_EDIT** ***content://contacts/people/2***
Edit information about the person whose identifier is "2".

**ACTION_VIEW** ***content://contacts/people/2***
Used to start an activity to display 2-*nd* person.

**ACTION_VIEW** ***content://contacts/*** **people/**
Display a list of people, which the user can browse through. Selecting a particular person to view would result in a new intent


# Intents

## Built-in Standard Actions

List of standard actions that Intents can use for launching activities (usually through *startActivity(Intent).*

| | |
|---|---|
| **ACTION_MAIN** | ACTION_ANSWER |
| ACTION_VIEW | ACTION_INSERT |
| ACTION_ATTACH_DATA | ACTION_DELETE |
| **ACTION_EDIT** | ACTION_RUN |
| ACTION_PICK | ACTION_SYNC |
| ACTION_CHOOSER | ACTION_PICK_ACTIVITY |
| ACTION_GET_CONTENT | **ACTION_SEARCH** |
| ACTION_DIAL | **ACTION_WEB_SEARCH** |
| **ACTION_CALL** | ACTION_FACTORY_TEST |
| ACTION_SEND | |
| **ACTION_SENDTO** | |

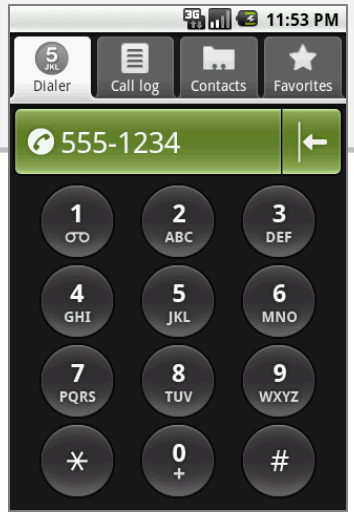

# Intents

Taken from: http://code.google.com/android/reference/android/content/Intent.html

## Example

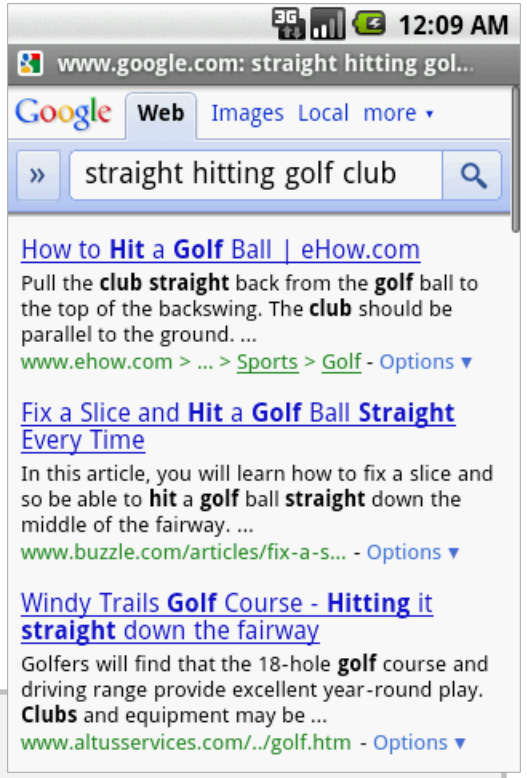
Display the phone dialer with the given number filled in.

```
Intent myActivity2 = new Intent (Intent.ACTION_DIAL,
                                 Uri.parse( "tel:555-1234"));
startActivity(myActivity2);
```



# Intents

Taken from: http://code.google.com/android/reference/android/content/Intent.html




## Intents - Secondary Attributes

In addition to the primary *action/data* attributes, there are a number of ***secondary attributes*** that you can also include with an intent, such as:

1. Category
2. Components
3. Type
4. Extras

**Example:** Doing a Google search looking for golf clubs

```
Intent intent = new Intent (Intent.ACTION_WEB_SEARCH );

intent.putExtra(SearchManager.QUERY,
                "straight hitting golf clubs");

startActivity(intent);
```

Secondary data

*Apparently the Google answer is 'none'*


# Intents

Taken from: http://code.google.com/android/reference/android/content/Intent.html

## Intents - Secondary Attributes

**Example:** Sending a text message (using extra attributes)

```
Intent intent = new Intent( Intent.ACTION_SENDTO,
                            Uri.parse("sms://"));

intent.putExtra("address",  "555-1234");
intent.putExtra("sms_body", "remember to buy bread and milk");

startActivity(intent);
```


*"address", "sms_body" are keywords*

# Intents


Taken from: http://code.google.com/android/reference/android/content/Intent.html

## Intents - Secondary Attributes

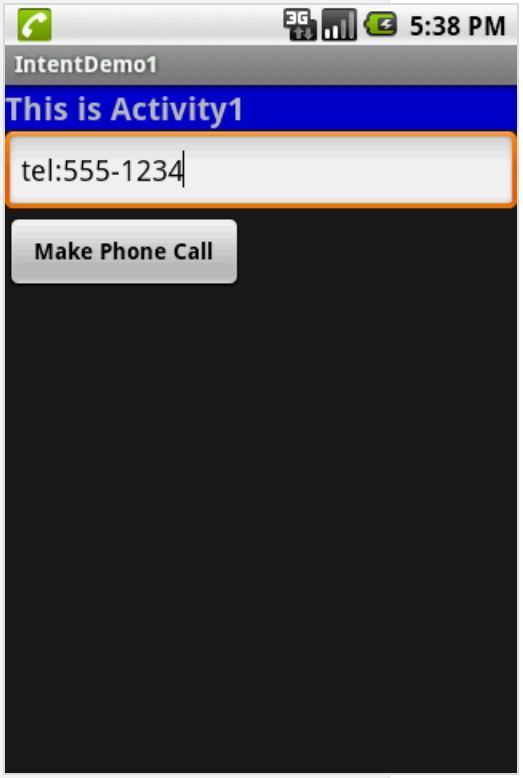
**Example:** Showing Pictures (using extra attributes)

```
Intent myIntent = new Intent();

myIntent.setType("image/pictures/*");
myIntent.setAction(Intent.ACTION_GET_CONTENT);

startActivity(myIntent);
```

# Intents

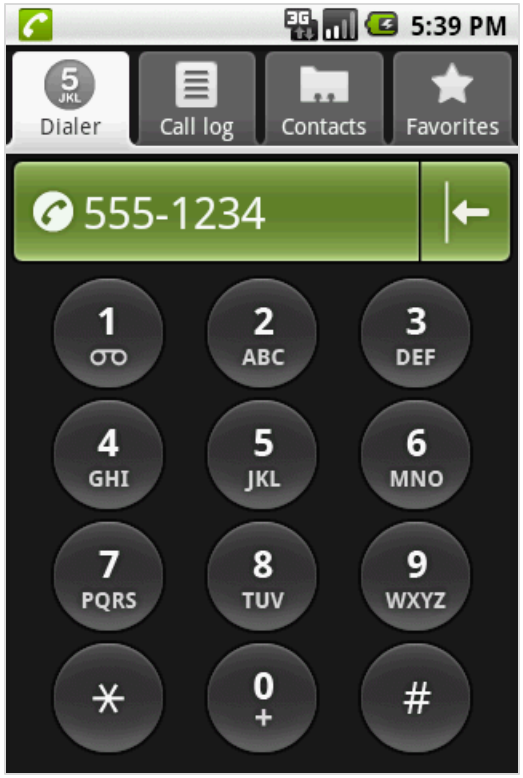
**1. A Complete Example**: Activity1 displays an interface to accept a phone number and requests (built-in) Activity2 to make the call.

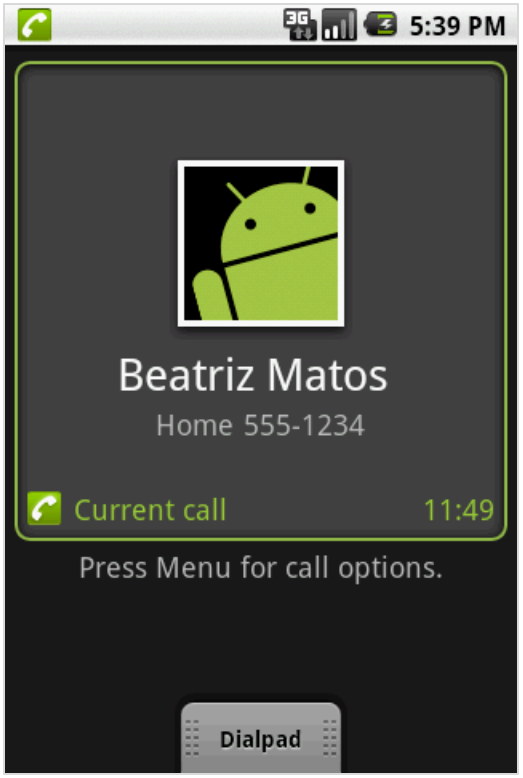
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"  >
<TextView
      android:id="@+id/label1"
      android:layout_width="fill_parent"
      android:layout_height="wrap_content"
      android:background="#ff0000cc"
      android:text="This is Activity1"
      android:textStyle="bold"
      android:textSize="20sp"   />
<EditText
      android:id="@+id/text1"
      android:layout_width="fill_parent"
      android:layout_height="54px"
      android:text="tel:555-1234"
      android:textSize="18sp"  />

<Button
      android:id="@+id/btnCallActivity2"
      android:layout_width="149px"
      android:layout_height="wrap_content"
      android:text="Make Phone Call"
      android:textStyle="bold" />
</LinearLayout>
```

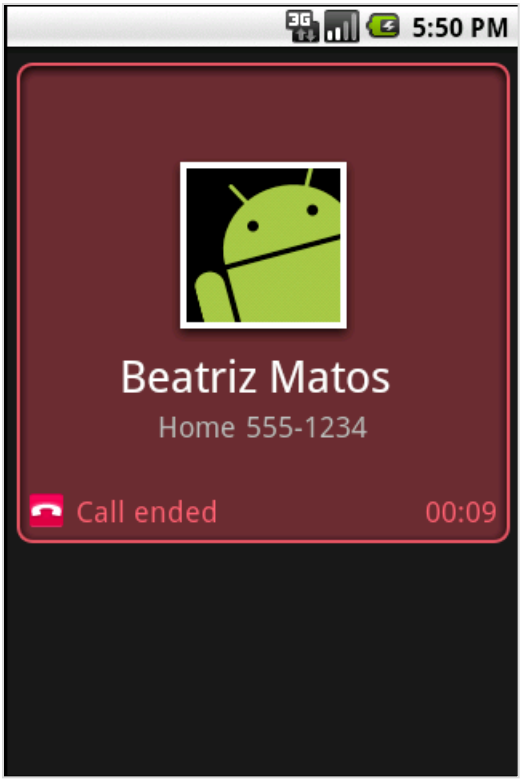


# Intents

**1. A Complete Example**: Activity1 displays an interface to accept a phone number and requests (built-in) Activity2 to make the call.




# Intents

**1. A Complete Example**: Activity1 displays an interface to accept a phone number and requests (built-in) Activity2 to make the call.

```
//IntentDemo1_Intent: making a phone call
package cis493.intents;
import android.app.Activity;
import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.view.View;
import android.view.View.OnClickListener;
import android.widget.*;

public class IntentDemo1 extends Activity {
    TextView label1;
    EditText text1;
    Button   btnCallActivity2;
```

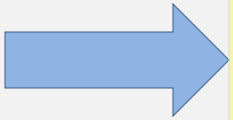
# Intents

**1. A Complete Example**: Activity1 displays an interface to accept a phone number and requests (built-in) Activity2 to make the call.

```
@Override
    public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    try {

        setContentView(R.layout.main);
        label1 = (TextView)findViewById(R.id.label1);
        text1 = (EditText)findViewById(R.id.text1);

        btnCallActivity2 = (Button)findViewById(R.id.btnCallActivity2);
        btnCallActivity2.setOnClickListener(new ClickHandler());
    }
   catch (Exception e) {
        Toast.makeText(getBaseContext(), e.getMessage(),
                       Toast.LENGTH_LONG).show();
    }
  }//onCreate
```

# Intents

**1. A Complete Example**: Activity1 displays an interface to accept a phone number and requests (built-in) Activity2 to make the call.



```
private class ClickHandler implements OnClickListener {
        @Override
        public void onClick(View v) {
         try {
            // myActivity2 places a phone call
            // for ACTION_CALL or ACTION_DIAL
            // use 'tel:' formatted data: "tel:555-1234"
            // for ACTION_VIEW use data:  "http://www.youtube.com"
            // (you also need INTERNET permission - see Manifest)

            String myData = text1.getText().toString();
            Intent myActivity2 = new Intent(Intent.ACTION_DIAL,
                                            Uri.parse(myData));
            startActivity(myActivity2);
         }
         catch (Exception e) {
            Toast.makeText(getBaseContext(), e.getMessage(),
            Toast.LENGTH_LONG).show();
         }
        }//onClick
    }//ClickHandler
}//IntentDemo1
```

# Intents

**1. A Complete Example**: Activity1 displays an interface to accept a phone number and requests (built-in) Activity2 to make the call.

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
      package="cis493.intents"
      android:versionCode="1"
      android:versionName="1.0">
<application android:icon="@drawable/icon"
             android:label="@string/app_name">
 <activity  android:name=".IntentDemo1"
            android:label="@string/app_name">
  <intent-filter>
    <action android:name="android.intent.action.MAIN" />
    <category android:name="android.intent.category.LAUNCHER" />
  </intent-filter>
 </activity>
  </application>
    <uses-sdk android:minSdkVersion="3" />
</manifest>
```

Action/category


# Intents

## Built-in Standard Broadcast Actions

List of standard actions that Intents can use for receiving broadcasts (usually through *registerReceiver(BroadcastReceiver, IntentFilter)* or a *<receiver>* tag in a manifest).

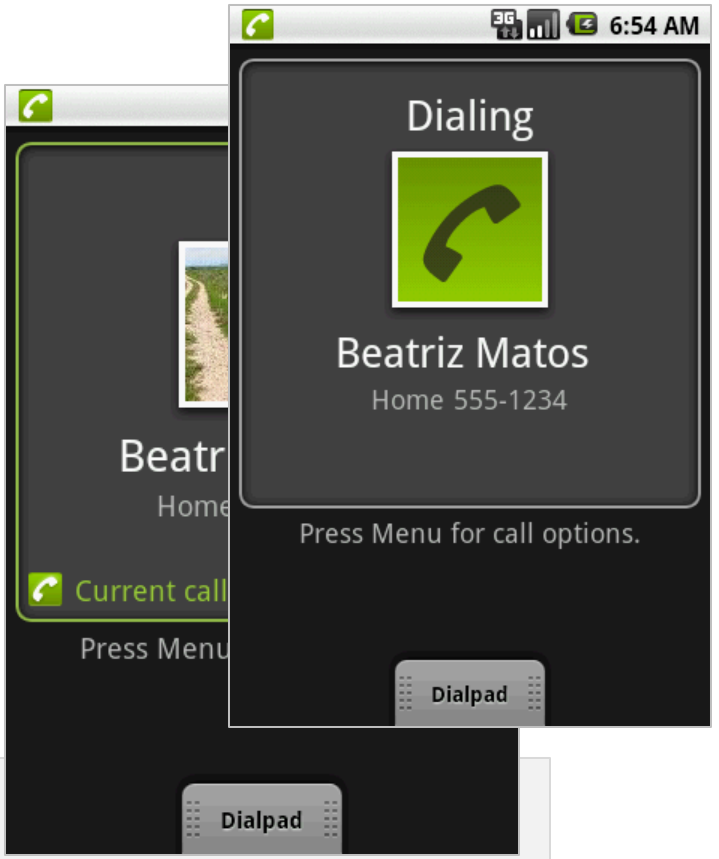
| | |
|---|---|
| ACTION_TIME_TICK<br>ACTION_TIME_CHANGED<br>ACTION_TIMEZONE_CHANGED<br>ACTION_BOOT_COMPLETED<br>ACTION_PACKAGE_ADDED<br>ACTION_PACKAGE_CHANGED<br>ACTION_PACKAGE_REMOVED<br>ACTION_UID_REMOVED<br>ACTION_BATTERY_CHANGED | |

# Intents

## More Examples: Using Standard Actions

### Call Immediately

Modify the *complete* example1 replacing the method 'ClickHandler' with the following code

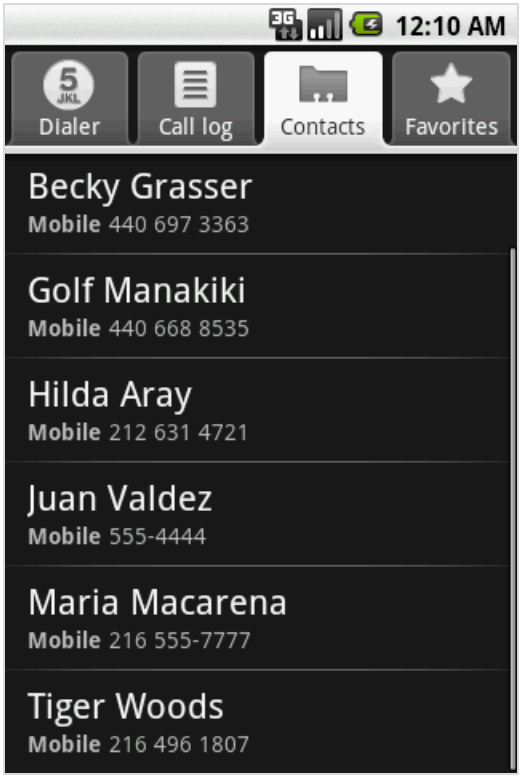



```
String myData = "tel:555-1234";

Intent myActivity2 = new Intent(Intent.ACTION_CALL,
                                Uri.parse(myData));

startActivity(myActivity2);
```

Needs Permission:

```
<uses-permission android:name="android.permission.CALL_PHONE" />
```

# Intents



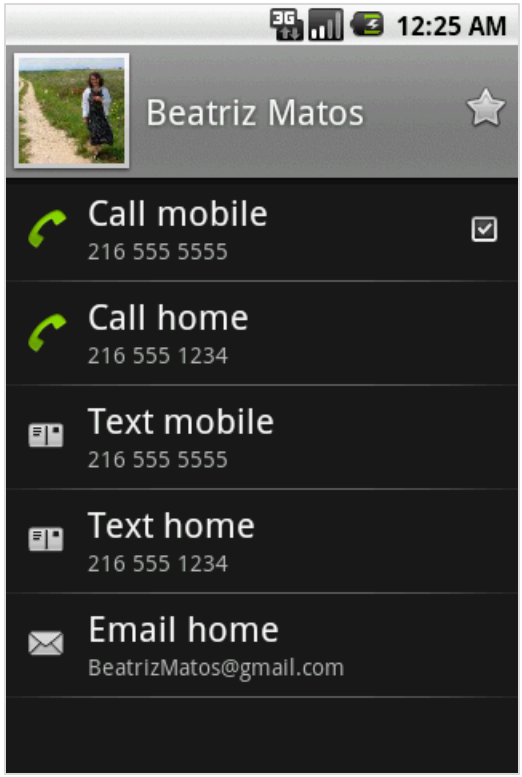

## More Examples: Using Standard Actions

**Show all your Contacts**

Modify the *complete* example1 replacing the method 'ClickHandler' with the following code

```
String myData = "content://contacts/people/";

Intent myActivity2 = new Intent(Intent.ACTION_VIEW,
                                Uri.parse(myData));

startActivity(myActivity2);
```

# Intents




## More Examples: Using Standard Actions

**Show a Particular Contact (ID = 2)**

Modify the *complete* example1 replacing the method 'ClickHandler' with the following code

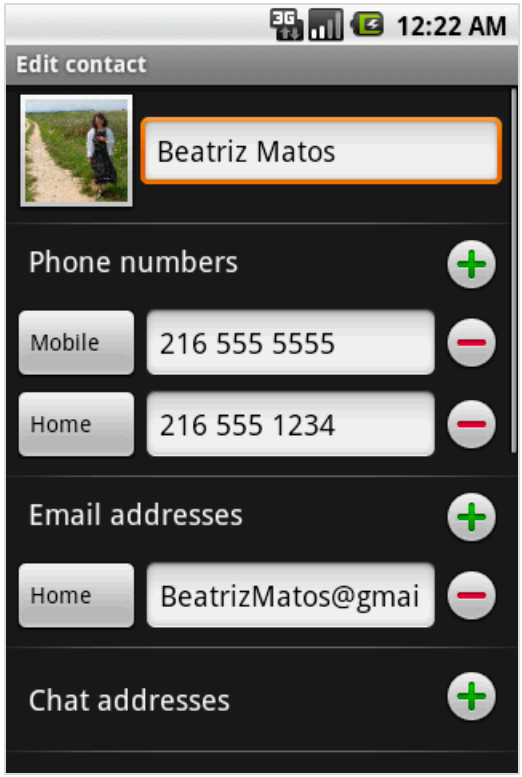
```
String myData = "content://contacts/people/2";

Intent myActivity2 = new Intent(Intent.ACTION_VIEW,
                                Uri.parse(myData));

startActivity(myActivity2);
```

# Intents

## More Examples: Using Standard Actions

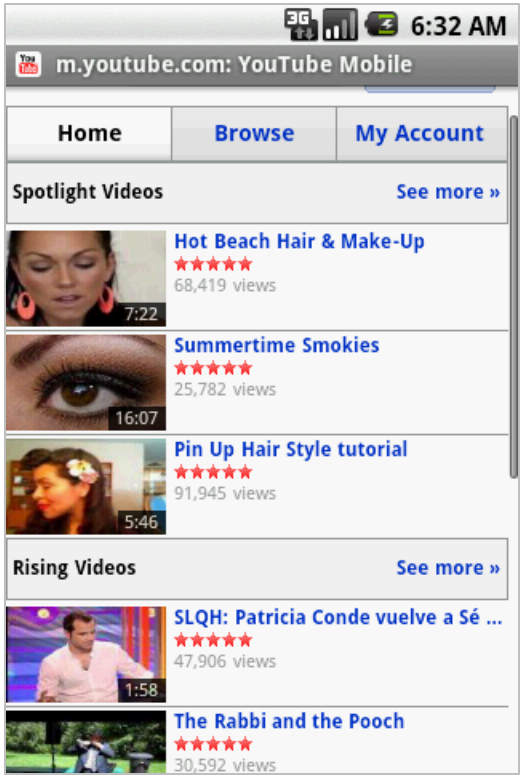
**Edit a Particular Contact (ID = 2)**

Modify the *complete* example1 replacing the method 'ClickHandler' with the following code




```
String myData = "content://contacts/people/2";

Intent myActivity2 = new Intent(Intent.ACTION_EDIT,
                                Uri.parse(myData));

startActivity(myActivity2);
```

# Intents




## More Examples: Using Standard Actions

### View a Webpage

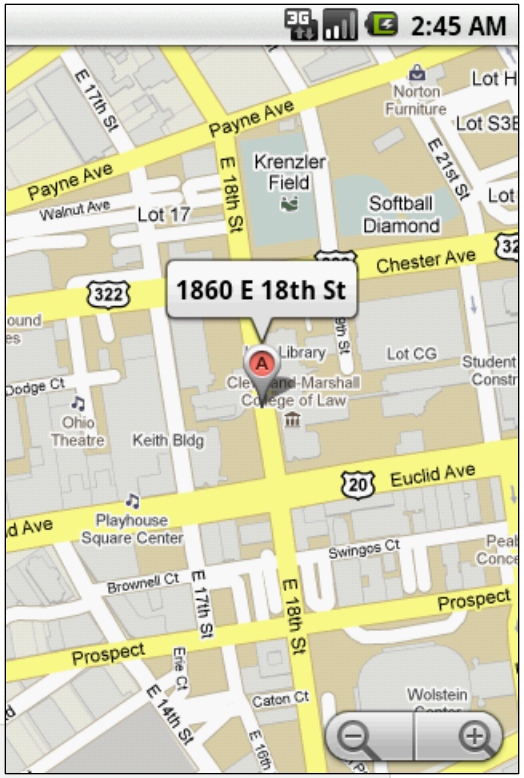
Modify the *complete* example1 replacing the method 'ClickHandler' with the following code

```
String myData = "http://www.youTube.com";

Intent myActivity2 = new Intent(Intent.ACTION_VIEW,
                                Uri.parse(myData));

startActivity(myActivity2);
```

**Caution.** Add to the Manifest a request to use the Internet:

```
<uses-permission android:name="android.permission.INTERNET" />
```

# Intents




## More Examples: Using Standard Actions

## Geo Mapping an Address

Provide a geoCode expression holding a street address (or place, such as ‘golden gate ca’ )
Replace spaces with ‘+’.

```
String geoCode =
       "geo:0,0?q=1860+east+18th+street+cleveland+oh";
Intent intent = new Intent(Intent.ACTION_VIEW,
                           Uri.parse(geoCode));
startActivity(intent);
```

Modify the Manifest adding the following requests:

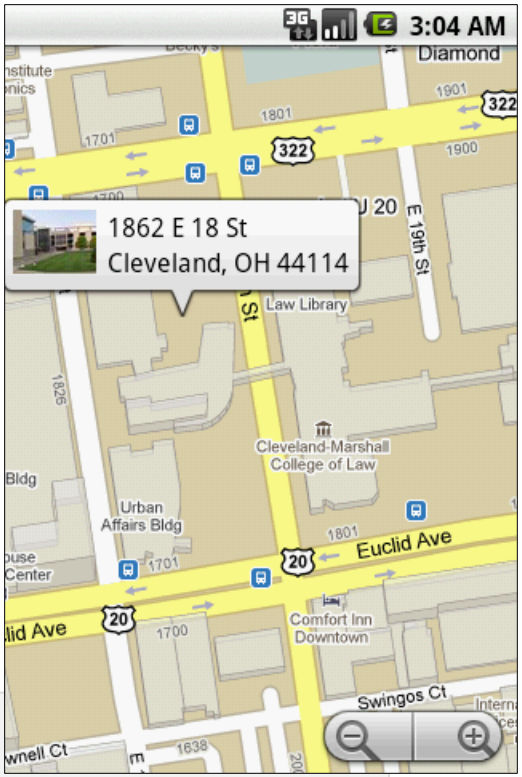
```
<uses-permission android:name="android.permission.ACCESS_COARSE_LOCATION" />
<uses-permission android:name="android.permission.INTERNET" />
```

# Intents

## More Examples: Using Standard Actions

**Geo Mapping Coordinates (latitude, longitude)**

Provide a geoCode holding latitude and longitude (also an addittional zoom '**?z=xx**' with xx in range 1..23)




```
String geoCode =
        "geo:41.5020952,-81.6789717";
Intent intent = new Intent(Intent.ACTION_VIEW,
                           Uri.parse(geoCode));
startActivity(intent);
```

Modify the Manifest adding the following requests:

```
<uses-permission android:name="android.permission.ACCESS_COARSE_LOCATION" />
<uses-permission android:name="android.permission.INTERNET" />
```

# Intents


## More Examples: Using Standard Actions

### Geo Mapping - Google StreetView

geoCode Uri structure:

google.streetview:cbll=***lat,lng***&cbp=1,
*yaw,,pitch,zoom*&mz=*mapZoom*

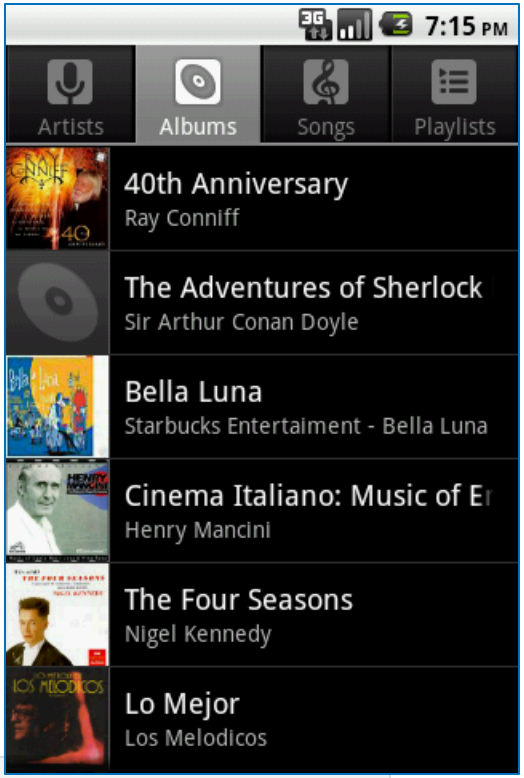
*Reference:* http://developer.android.com/guide/appendix/g-app-intents.html

```
String geoCode =
      "google.streetview:cbll=41.5020952,-81.6789717&cbp=1,270,,45,1&mz=1";

Intent intent = new Intent(Intent.ACTION_VIEW,
                           Uri.parse(geoCode));
startActivity(intent);
```

Modify the Manifest adding the following requests:

```
<uses-permission android:name="android.permission.ACCESS_COARSE_LOCATION" />
<uses-permission android:name="android.permission.INTERNET" />
```

# Intents



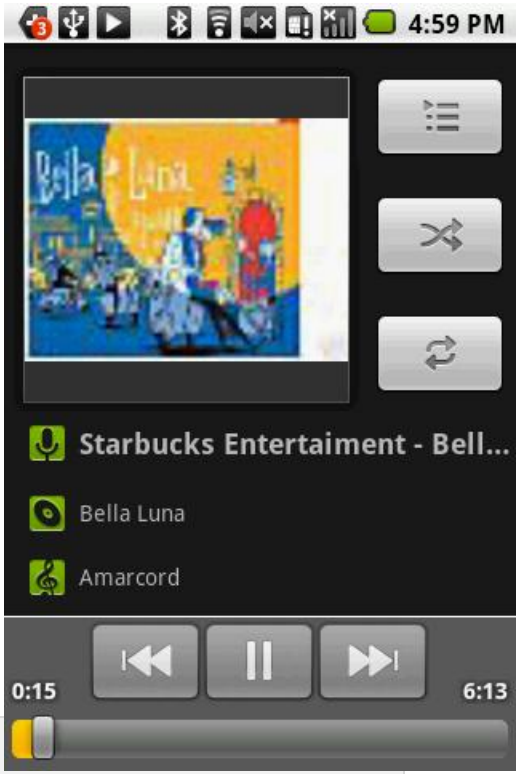

## More Examples: Using Standard Actions

## Launching the Music Player

*Reference:* http://developer.android.com/guide/appendix/g-app-intents.html

```
//launch music player

Intent myActivity2 =
        new Intent("android.intent.action.MUSIC_PLAYER");

startActivity(myActivity2);
```

# Intents



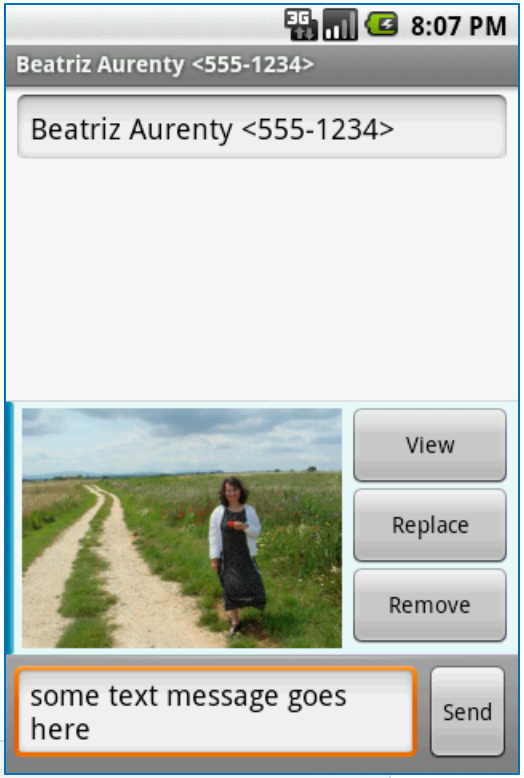

## More Examples: Using Standard Actions

## Playing a song stored in the SD card

*Reference:* http://developer.android.com/guide/appendix/g-app-intents.html

```
// play song "amarcord.mp3" saved in the SD
Intent myActivity2 =
        new Intent(android.content.Intent.ACTION_VIEW);

Uri data = Uri.parse("file:///sdcard/amarcord.mp3");
String type = "audio/mp3";

myActivity2.setDataAndType(data, type);

startActivity(myActivity2);
```


# Intents




## More Examples: Using Standard Actions

### Sending MMS

Add picture #1 from SD to MMS

*Reference:* http://developer.android.com/guide/appendix/g-app-intents.html

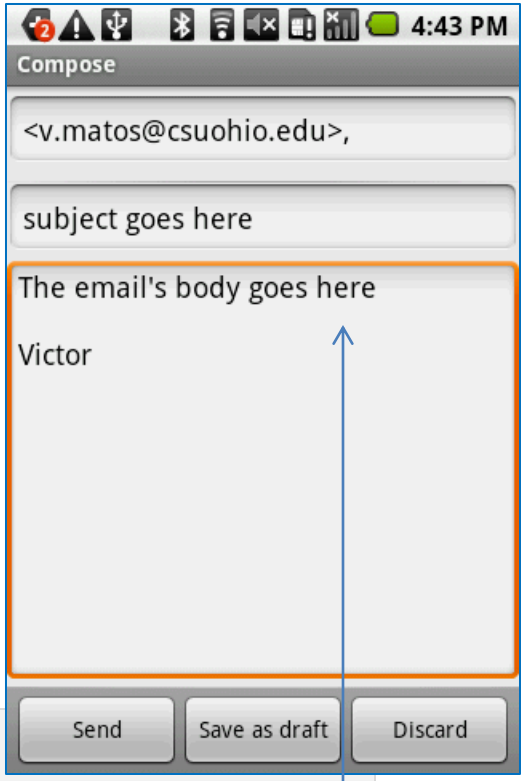
```
//send mms attach picture #1 to it

Uri uri = Uri.parse("content://media/external/images/media/1");

myActivity2 = new Intent(Intent.ACTION_SEND);

myActivity2.putExtra("address", "555-1234");
myActivity2.putExtra("sms_body", "some text message goes here");
myActivity2.putExtra(Intent.EXTRA_STREAM, uri);
myActivity2.setType("image/png");

startActivity(myActivity2);
```

# Intents

## More Examples: Using Standard Actions

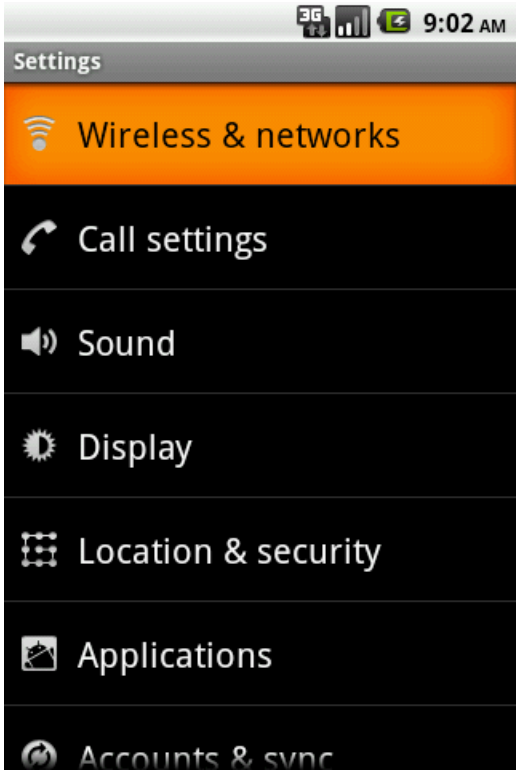
## Sending Email

*Reference:* http://developer.android.com/guide/appendix/g-app-intents.html




```
// send email
Uri uri = Uri.parse("mailto:v.matos@csuohio.edu");
Intent myActivity2 = new Intent(Intent.ACTION_SENDTO, uri);

// you may skip the next two pieces [subject/text]
myActivity2.putExtra(Intent.EXTRA_SUBJECT,
                     "subject goes here");
myActivity2.putExtra(Intent.EXTRA_TEXT,
                     "The email's body goes here");

startActivity(myActivity2);
```


# Intents




## More Examples: Using Standard Actions

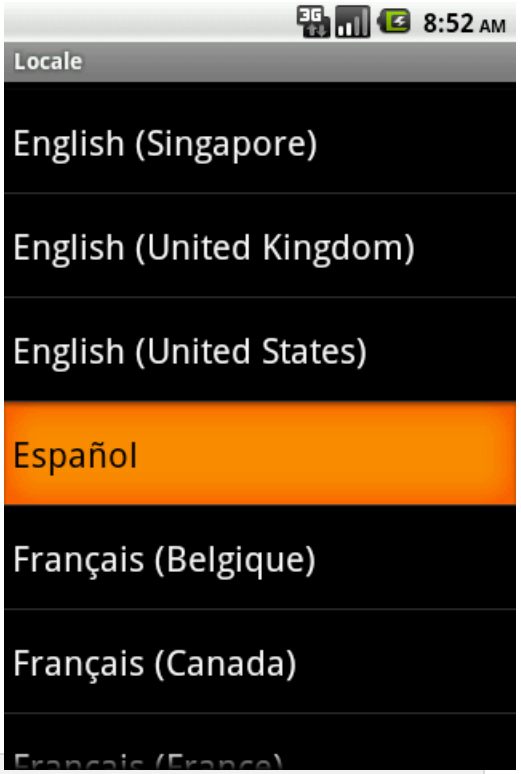
## Setting System

*Reference:* http://developer.android.com/reference/android/provider/Settings.html

```
Intent intent = new Intent(
            android.provider.Settings.ACTION_SETTINGS);

startActivity(intent);
```



# Intents




## More Examples: Using Standard Actions

## Setting System Locale: Language & Keyboard

*Reference:* http://developer.android.com/reference/android/provider/Settings.html

```
Intent intent = new Intent(

            android.provider.Settings.ACTION_LOCALE_SETTINGS);

startActivity(intent);
```


# Intents

## Starting Activities and Getting Results

The **startActivity(Intent)** method is used to start a new activity, which will be placed at the top of the activity stack.

Sometimes you want to get a result back from the called sub-activity when it ends.

For example, you may start an activity that let the user pick a person from a list of contacts; when it ends, it returns the person that was selected.


# Intents

## Starting Activities and Getting Results

In order to get results back from the called activity we use the method

**startActivityForResult ( Intent, requestCodeID )**

Where the second (*requestCodeID*) parameter identifies the call.

The result sent by the sub-activity could be picked up through the asynchronous method

**onActivityResult ( requestCodeID, resultCode, Intent )**


# Intents

## Starting Activities and Getting Results

- Before an activity exits, it can call **setResult (resultCode)** to return a termination signal back to its parent.

- Always supply a result code, which can be the standard results **Activity.RESULT_CANCELED, Activity.RESULT_OK**, or any custom values.

- All of this information can be capture back on the parent's

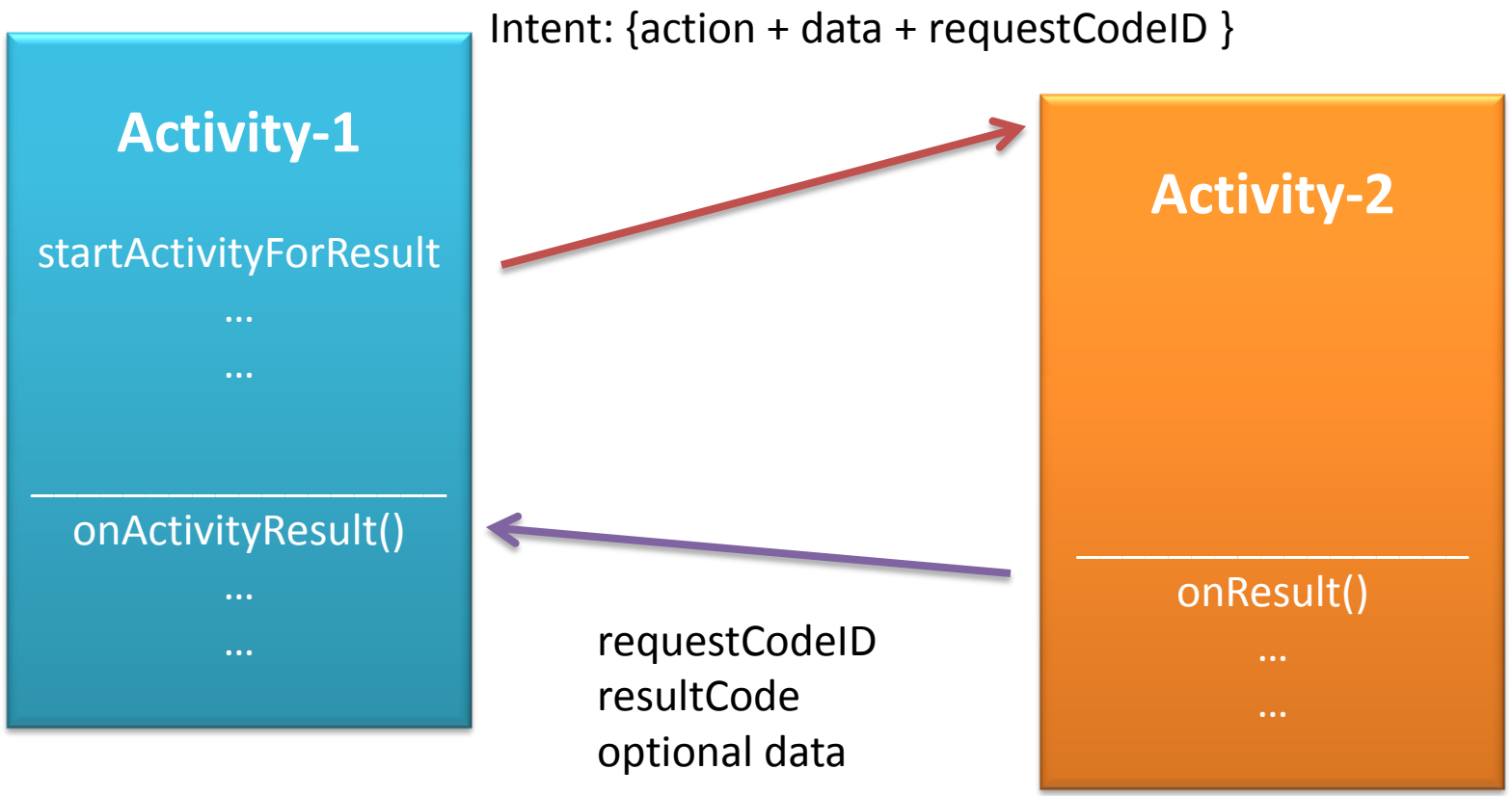
```
onActivityResult (int requestCodeID, int resultCode, Intent data)
```

along with the integer identifier it originally supplied.

- If a child activity fails for any reason (such as crashing), the parent activity will receive a result with the code **RESULT_CANCELED**.


# Intents

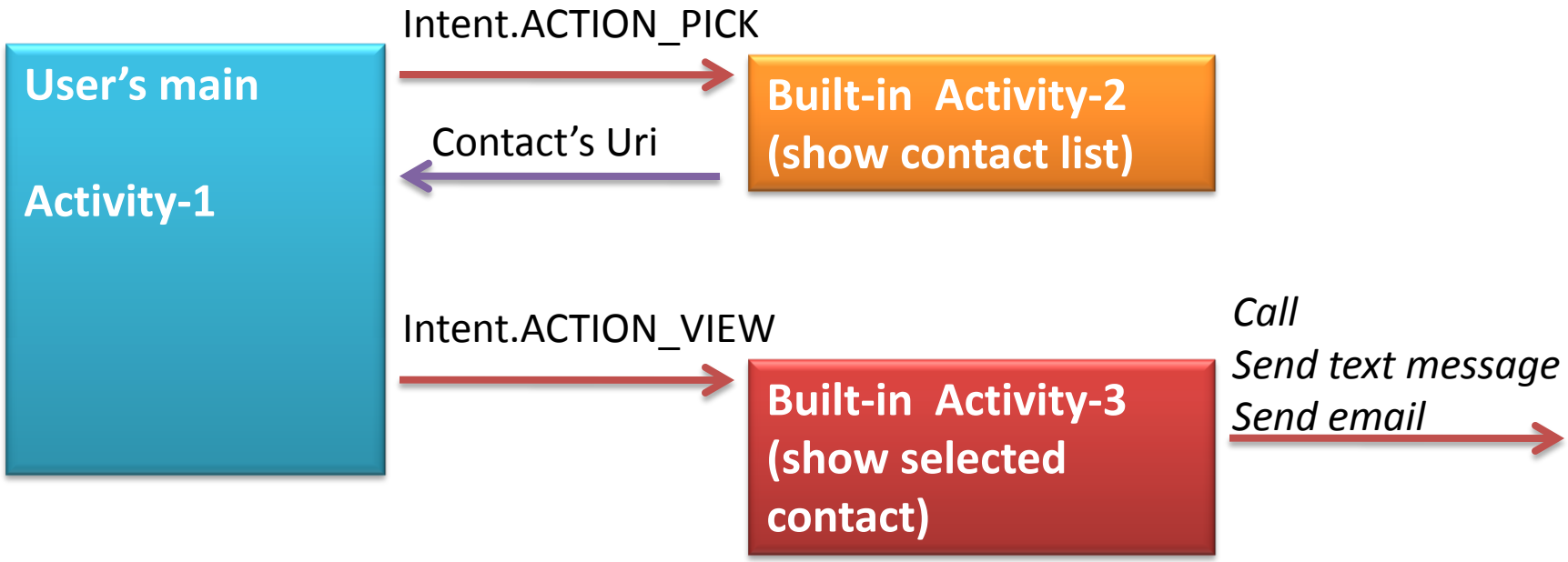
## Starting Activities and Getting Results



# Intents

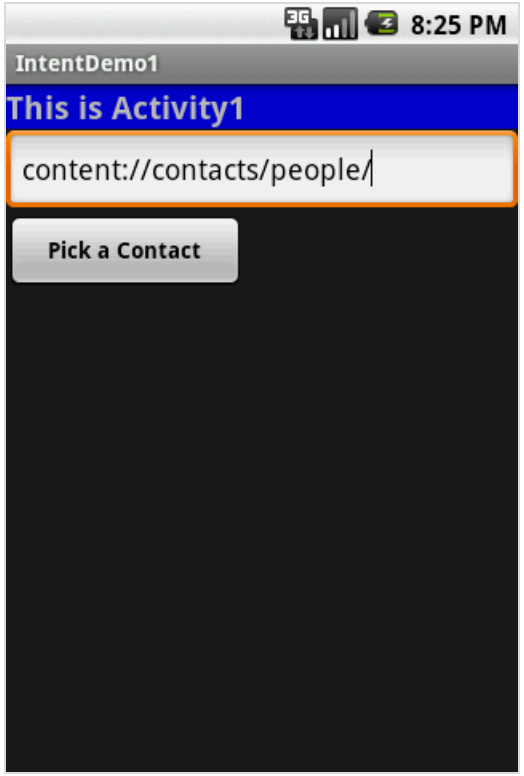
**Example2**. Let's play golf - Call for a tee-time.

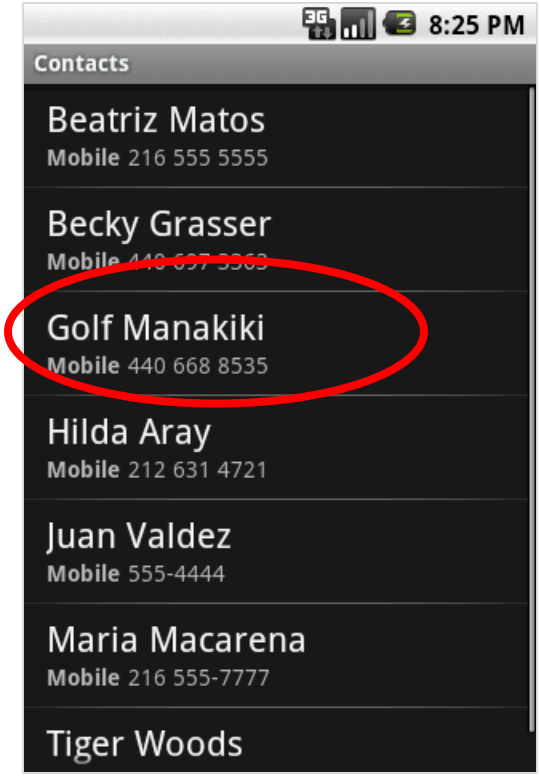
1. Show all contacts and pick a particular one (*Intent.ACTION_PICK*).
2. For a successful interaction the main-activity accepts the returned URI identifying the person we want to call (*content://contacts/people/n*).
3. 'Nicely' show the selected contact's entry allowing calling, texting, emailing actions (Intent.ACTION_VIEW).

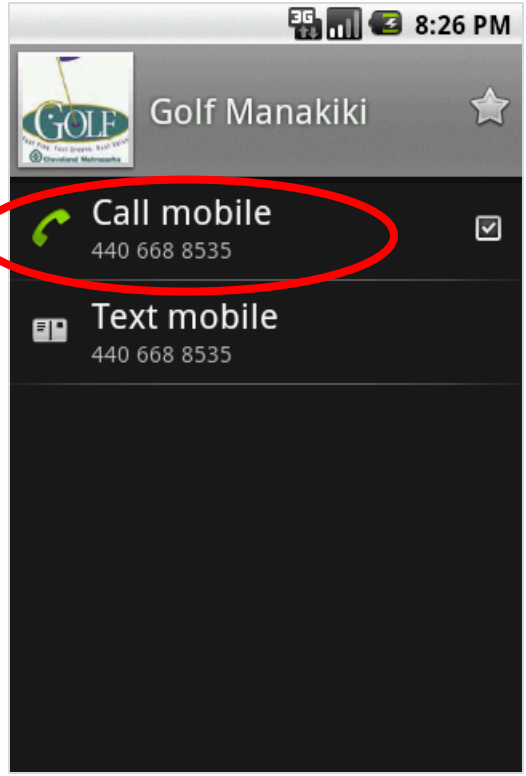


# Intents

**Example2**. Let's play golf - *Call for a tee-time*.




Cont.

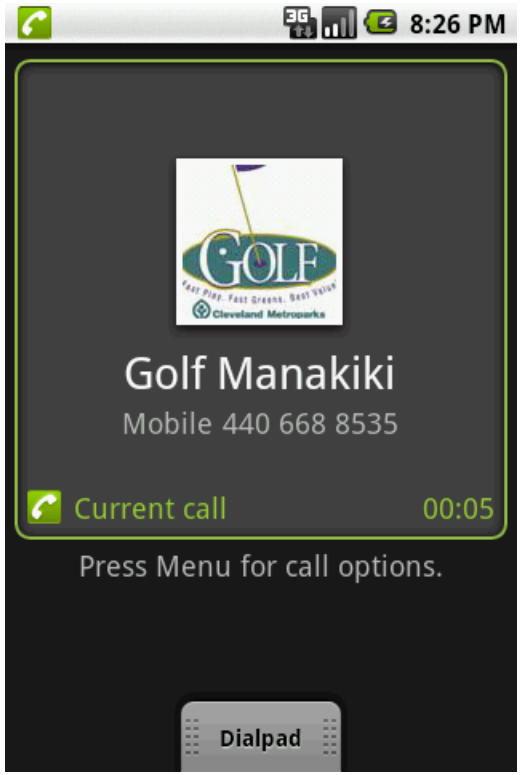
Main Activity

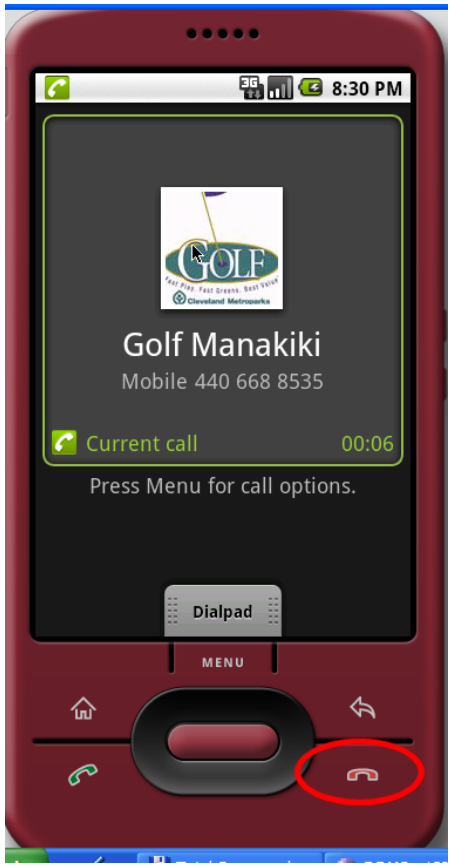
Intent.ACTION_PICK

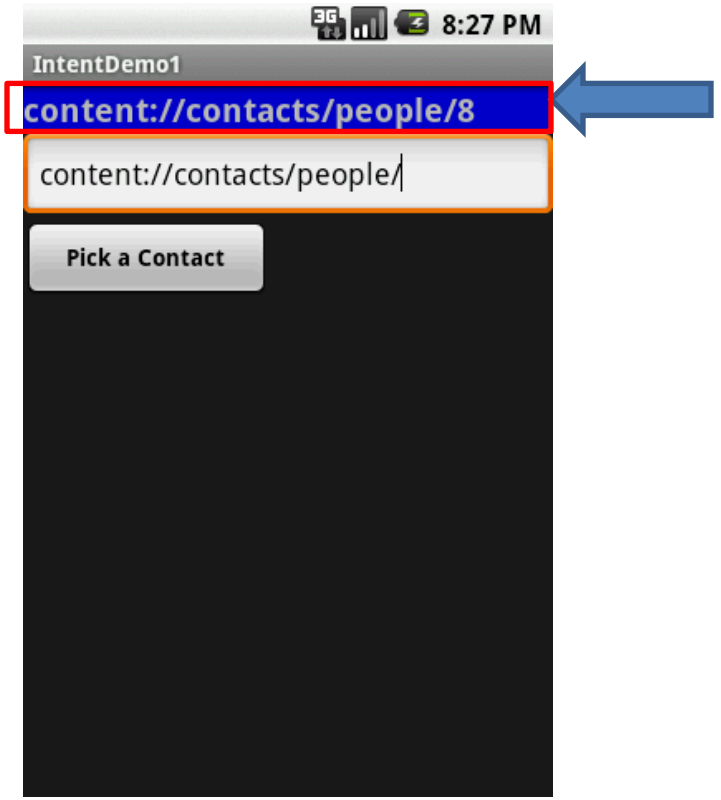
Intent.ACTION_VIEW

# Intents

**Example2 (cont.)** Let's play golf - *Call for a tee-time*




Place the call

Terminate the call

Selected contact's URI


# Intents

**Example2**. *Calling a sub-activity, receiving results.*

```
//IntentDemo2_Intent: making a phone call
//receiving results from a sub-activity
package cis493.intents;
import android.app.Activity;
import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.view.View;
import android.view.View.OnClickListener;
import android.widget.*;

public class IntentDemo2 extends Activity {
    TextView label1;
    EditText text1;
    Button   btnCallActivity2;
```


# Intents

**Example2**. *Calling a sub-activity, receiving results.*

```
@Override
   public void onCreate(Bundle savedInstanceState) {
   super.onCreate(savedInstanceState);
   try {
            setContentView(R.layout.main);
            label1 = (TextView)findViewById(R.id.label1);
            text1 = (EditText)findViewById(R.id.text1);

            btnCallActivity2 = (Button)findViewById(R.id.btnPickContact);
            btnCallActivity2.setOnClickListener(new ClickHandler());
   }
   catch (Exception e) {
             Toast.makeText(getBaseContext(),
             e.getMessage(), Toast.LENGTH_LONG).show();
   }
 }//onCreate
```


# Intents

**Example2**. *Calling a sub-activity, receiving results.*

```
private class ClickHandler implements OnClickListener {
    @Override
    public void onClick(View v) {
        try {
             // myData refer to: content://contacts/people/
             String myData = text1.getText().toString();

             //you may also try ACTION_VIEW instead
             Intent myActivity2 = new Intent(Intent.ACTION_PICK,
                                      Uri.parse(myData));
            // start myActivity2.
            // Tell it that our requestCodeID (or nickname) is 222
            startActivityForResult(myActivity2, 222);

            // Toast.makeText(getApplicationContext(),
            //                "I can't wait for you", 1).show();
        }
        catch (Exception e) {
            label1.setText(e.getMessage());
    }
    }//onClick
  }//ClickHandler
```

# Intents

**Example2**. *Calling a sub-activity, receiving results.*

Listener

```
@Override
protected void onActivityResult(int requestCode,
                                int resultCode,
                                Intent data) {
    super.onActivityResult(requestCode, resultCode, data);
    try {
        // use requestCode to find out who is talking back to us
        switch (requestCode){
            case (222): {
                // 222 is our friendly contact-picker activity
                if (resultCode == Activity.RESULT_OK) {
                    String selectedContact = data.getDataString();
                    // it will return an URI that looks like:
                    // content://contacts/people/n
                    // where n is the selected contacts' ID
                    label1.setText(selectedContact.toString());

                    //show a 'nice' screen with the selected contact
                    Intent myAct3 = new Intent (Intent.ACTION_VIEW,
                                                Uri.parse(selectedContact));
                    startActivity(myAct3);
                }
```


# Intents

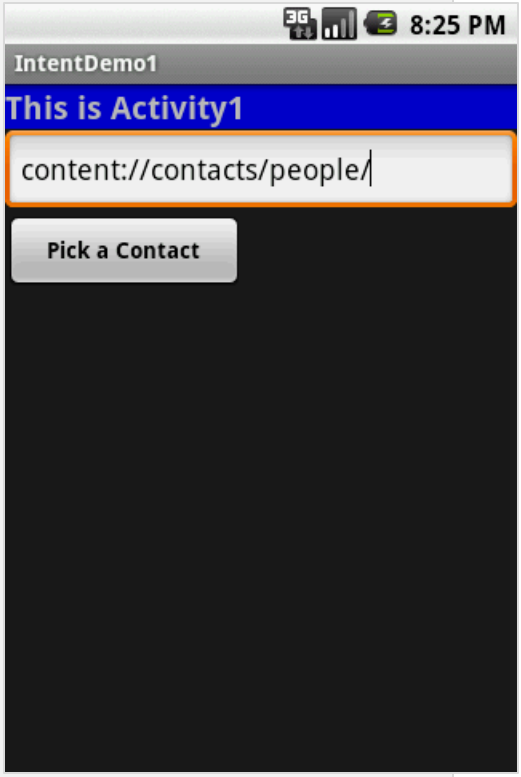
**Example2**. *Calling a sub-activity, receiving results.*

```
                    else {
                         //user pressed the BACK button
                         label1.setText("Selection CANCELLED "
                                        + requestCode + " " + resultCode);
                         }
                         break;
                    }
               }//switch
          }
          catch (Exception e) {
               Toast.makeText(getBaseContext(), e.getMessage(),
                              Toast.LENGTH_LONG).show();
          }
     }// onActivityResult

}//IntentDemo2
```

# Intents

**Example2**. *Calling a sub-activity, receiving results.*

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent" >
     <TextView
          android:id="@+id/label1"
          android:layout_width="fill_parent"
          android:layout_height="wrap_content"
          android:background="#ff0000cc"
          android:text="This is Activity1"
          android:textStyle="bold"
          android:textSize="20sp"/>
     <EditText
          android:id="@+id/text1"
          android:layout_width="fill_parent"
          android:layout_height="54px"
          android:text="content://contacts/people/"
          android:textSize="18sp"  />
     <Button
          android:id="@+id/btnPickContact"
          android:layout_width="149px"
          android:layout_height="wrap_content"
          android:text="Pick a Contact"
          android:textStyle="bold" />
</LinearLayout>
```



# Intents

**Example3**. Showing Pictures and Video - Calling a sub-activity, receiving results.

```
private void showSoundTracks() {

  Intent myIntent = new Intent();
  myIntent.setType("video/*, images/*");
  myIntent.setAction(Intent.ACTION_GET_CONTENT);
  startActivityForResult(myIntent, 0);

}//showSoundTracks


@Override
protected void onActivityResult(int requestCode, int resultCode, Intent intent) {
  super.onActivityResult(requestCode, resultCode, intent);

  if ((requestCode == 0) && (resultCode == Activity.RESULT_OK)) {

      String selectedImage = intent.getDataString();

      Toast.makeText(this, selectedImage, 1).show();

      // show a 'nice' screen with the selected image
      Intent myAct3 = new Intent(Intent.ACTION_VIEW, Uri.parse(selectedImage));
      startActivity(myAct3);
  }
}//onActivityResult
```

*All videos and all still images*

# Intents

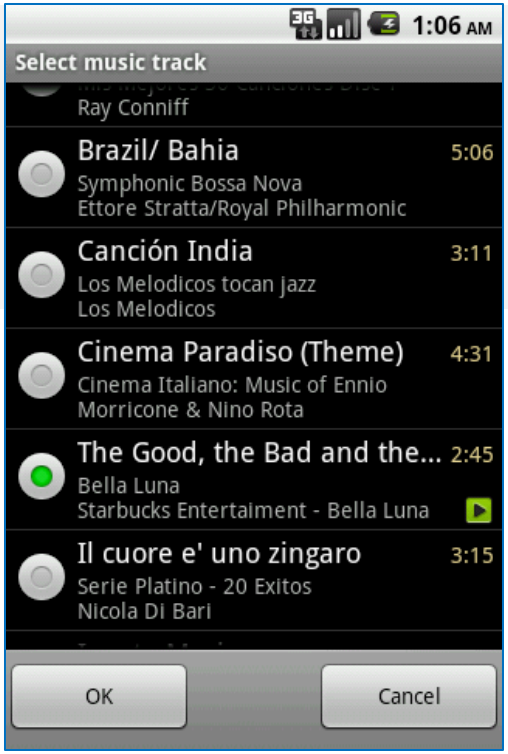
**Example3**. Showing Pictures and Video - Calling a sub-activity, receiving results.

# Intents

**Example4.** Showing/Playing Sound Tracks - Calling a sub-activity, receiving results.

```
private void showSoundTracks() {
   Intent myIntent = new Intent();
   myIntent.setType("audio/mp3");
   myIntent.setAction(Intent.ACTION_GET_CONTENT);
   startActivityForResult(myIntent, 0);
}//showSoundTracks
```

The returned string value is similar to the following "content://media/external/audio/media/14" ACTION_VIEW on that Uri would produce a result similar to the image on the right


# Intents

**Questions ?**


# Intents

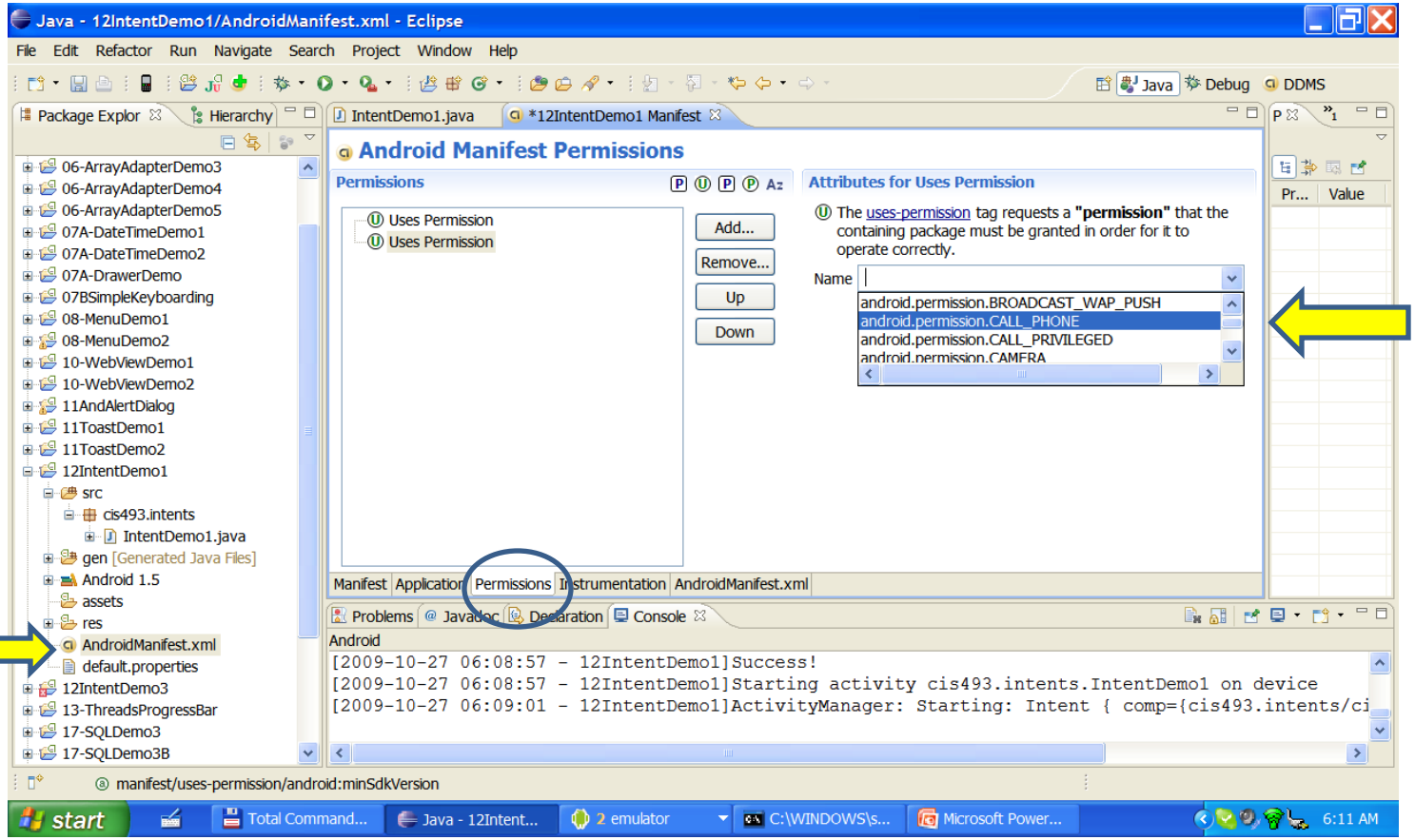
## Built-in Standard Broadcast Actions

List of standard actions that Intents can use for receiving broadcasts (usually through *registerReceiver(BroadcastReceiver, IntentFilter)* or a *<receiver>* tag in a manifest).

| | |
|---|---|
| ACTION_TIME_TICK<br>ACTION_TIME_CHANGED<br>ACTION_TIMEZONE_CHANGED<br>ACTION_BOOT_COMPLETED<br>ACTION_PACKAGE_ADDED<br>ACTION_PACKAGE_CHANGED<br>ACTION_PACKAGE_REMOVED<br>ACTION_UID_REMOVED<br>ACTION_BATTERY_CHANGED | |

# Intents

## Appendix: Getting Permissions




Becomes:

```
<uses-permission android:name="android.permission.CALL_PHONE"></uses-permission>
```