

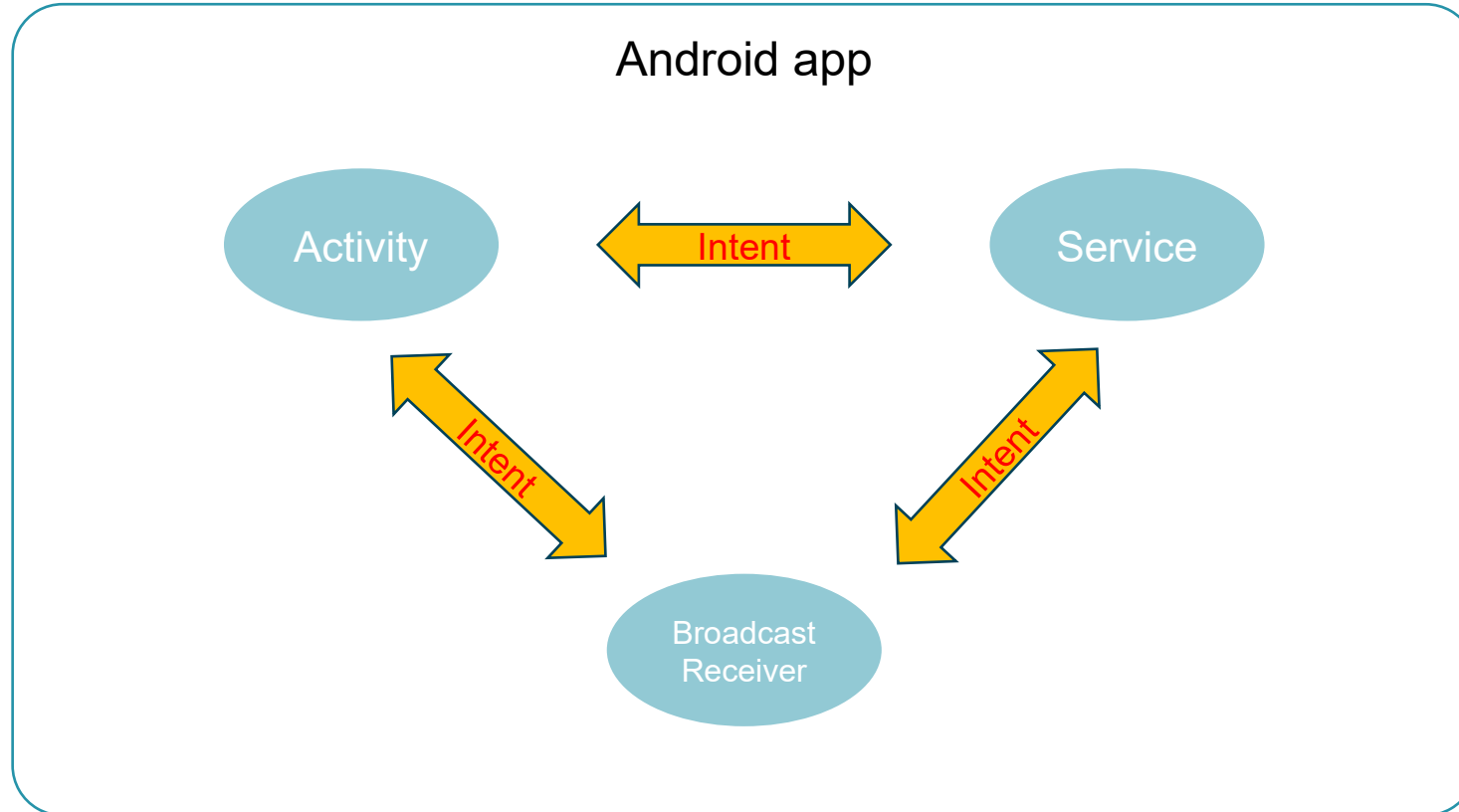
移动应用开发

张昕

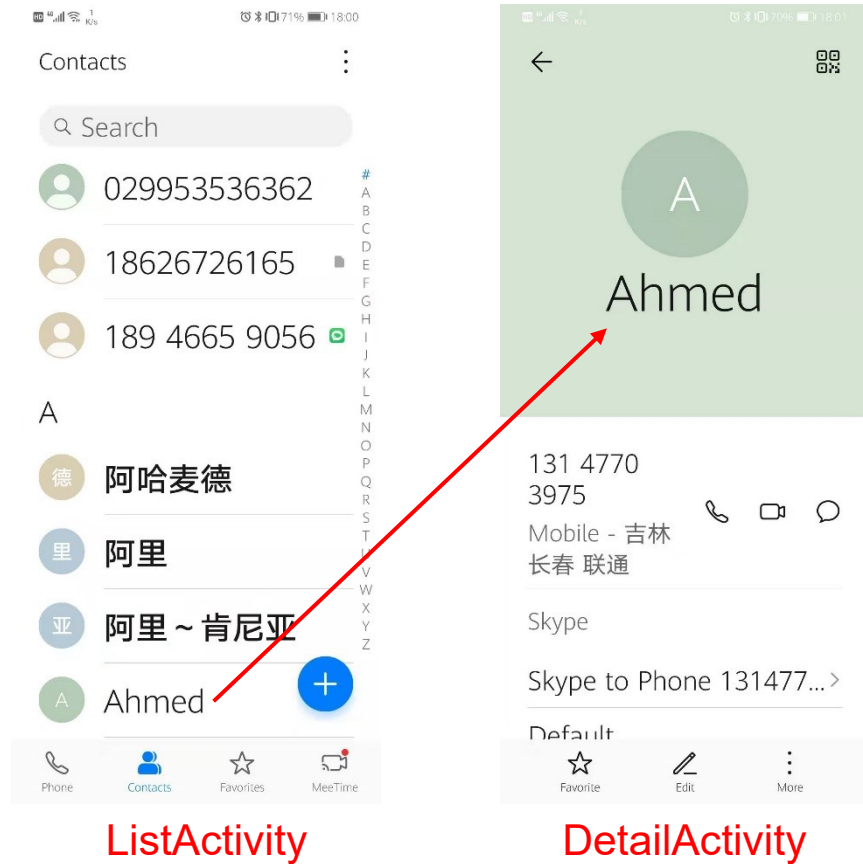
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2022

Android app



Intent



■ Example

- **ListActivity** creates an Intent for notifying the system to open the detail of the selected contact
- Call `startActivity(Intent intent)` and send the previously created Intent object as argument
- The system searches for the Activity within **AndroidManifest.xml** according to the Intent argument
- The latter Activity acts according to the description in the Intent

Intent application

■ Start Activity

- Start an Activity through sending an Intent object with necessary data to startActivity() method

or

- Send Intent object to startActivityForResult(), by which the result could be obtained by calling onActivityResult() in the upstream Activity

■ Start Service

- Start a Service, e.g., download file, through sending an Intent object with necessary data to startService() method

or

- Send Intent object to bindService(), by which a linkage between the original component and the target Service could be established



Intent application

- **Propagate Broadcast**
 - Propagate Broadcast to all the receivers by calling Broadcast methods
 - e.g., `sendBroadcast()`, `sendOrderedBroadcast()`, `sendStickyBroadcast()`, etc.

Intent category

■ Explicit Intent

- The explicit Intent specifies the receiver during the creating procedure
 - Such as Activity, Service or BroadcastReceiver
- When there are multiple activities, it is necessary to call startActivity() associated with Intent
- Procedures

① Create Intent object

```
Intent intent = new Intent(Context packageContext, Class<?> cls);
```

- intent: the object name of Intent object
- packageContext: specifies the context object for invoking Activity, usually as Activity name.this, e.g., MainActivity.this
- cls: specifies the class where the Activity is located, usually as Activity name.class, e.g., DetailActivity.class

Intent category

■ Explicit Intent

□ Procedures

② Call startActivity() method to start Activity

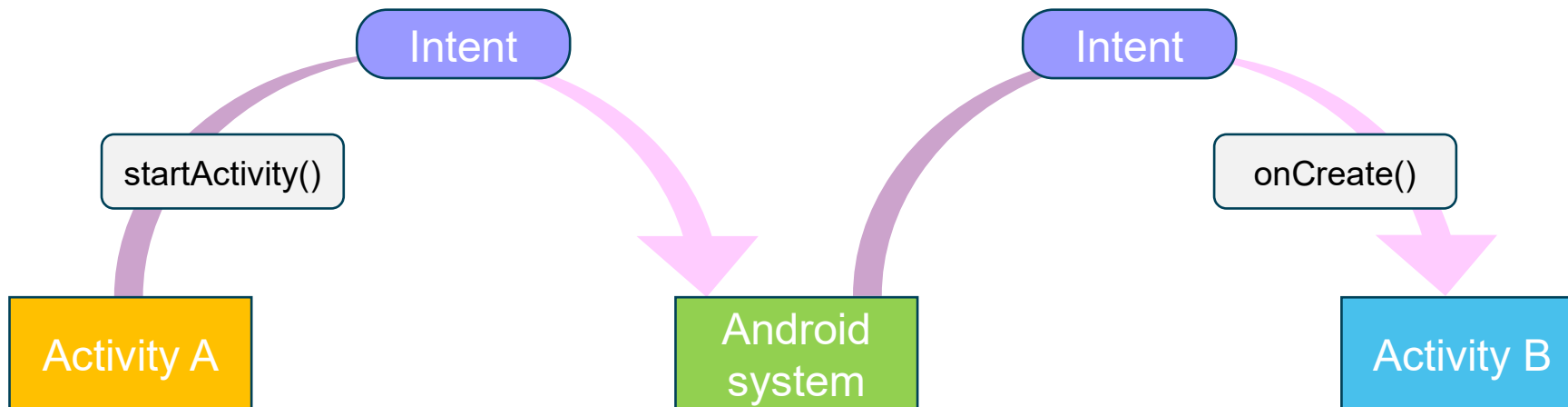
`public void startActivity(Intent intent)`

□ intent: the Intent object created in the previous procedure

Intent category

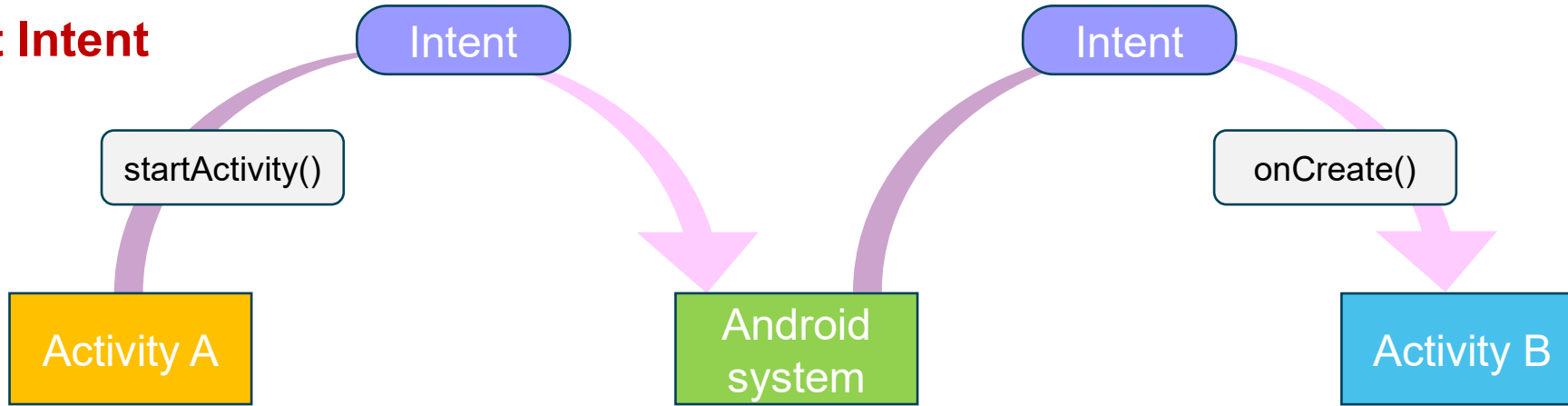
■ Implicit Intent

- The implicit Intent doesn't specify the receiver during the creating procedure, but it defines the Action, Category and Data to execute that could lead the system to find out the target Activity according to the corresponding mapping mechanism.



Intent category

■ Implicit Intent



□ Principle

- Activity A creates an Intent object that configures one Action object, and it send the Action object to startActivity()
- Android system search all the apps to map the Intent object.
- If one mapped Activity is found, Android system will send the Intent object to onCreate() method to create Activity B.

Intent category

■ Implicit Intent

□ Example: to display a webpage in your own app

□ It is not necessary to build up a new browser.

□ The system built-in browser could be called.

```
Intent intent = new Intent();  
intent.setAction(Intent.ACTION_VIEW);  
intent.setData(Uri.parse("http://www.cust.edu.cn"));  
startActivity(intent);
```

OR

```
Intent intent = new Intent(Intent.ACTION_VIEW,  
    Uri.parse("http://www.cust.edu.cn"));  
startActivity(intent);
```

//Intent.ACTION_VIEW: the action of Intent, i.e., the act to be executed.

ACTION_MAIN
ACTION_VIEW
ACTION_ATTACH_DATA
ACTION_EDIT
ACTION_PICK
ACTION_CHOOSER
ACTION_GET_CONTENT

ACTION_DIAL
ACTION_CALL
ACTION_SEND
ACTION_SENDTO
ACTION_ANSWER
ACTION_INSERT
ACTION_DELETE

ACTION_RUN
ACTION_SYNC
ACTION_PICK_ACTIVITY
ACTION_SEARCH
ACTION_WEB_SEARCH
ACTION_FACTORY_TEST

ACTION_ → android.intent.action.



Demo



Supported by MCCAT

Website: www.cust.edu.cn

E-mail: cust@cust.edu.cn

Tel: 0431-85583560



<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="@dimen/activity_horizontal_margin"
android:paddingRight="@dimen/activity_horizontal_margin"
android:paddingTop="@dimen/activity_vertical_margin"
android:paddingBottom="@dimen/activity_vertical_margin"
tools:context="com.example.intenttest.MainActivity">
```

<TextView

```
    android:id="@+id/text1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Supported by MCCAT"
    android:layout_marginTop="20dp"/>
```

<TextView

```
    android:id="@+id/text2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Website: www.cust.edu.cn"
    android:layout_marginTop="10dp"
    android:layout_below="@+id/text1"/>
```

<TextView

```
    android:id="@+id/text3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="E-mail: cust@cust.edu.cn"
    android:layout_marginTop="10dp"
    android:layout_below="@+id/text2"/>
```

<TextView

```
    android:id="@+id/text4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Tel: 0431-85583560"
    android:layout_marginTop="10dp"
    android:layout_below="@+id/text3"/>
```

<ImageButton

```
    android:id="@+id/imageButton_phone"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:src="@drawable/phone"
    android:layout_below="@+id/text4"
    android:layout_marginTop="30dp"
    android:background="#0000"
    android:scaleType="fitXY"
/>
```

<ImageButton

```
    android:id="@+id/imageButton_sms"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_toRightOf="@+id/imageButton_phone"
    android:layout_below="@+id/text4"
    android:layout_marginTop="30dp"
    android:layout_marginLeft="30dp"
    android:background="#0000"
    android:scaleType="fitXY"
    android:src="@drawable/sms"/>
```

</RelativeLayout>

Demo

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LTE

IntentTest

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```
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.intenttest">
    <uses-permission android:name="android.permission.CALL_PHONE"/>
    <uses-permission android:name="android.permission.SEND_SMS"/>
    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.ActivityProgramming">
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>
</manifest>
```



Demo

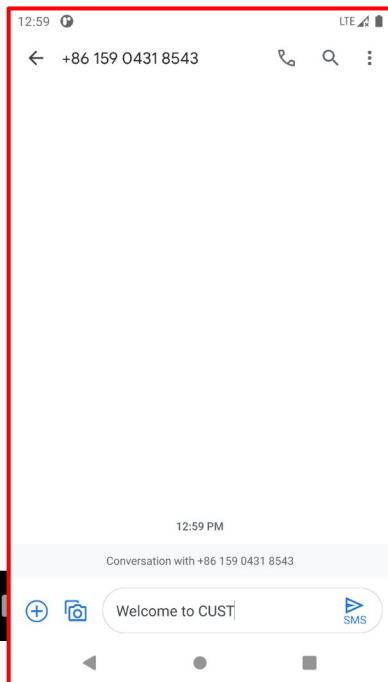
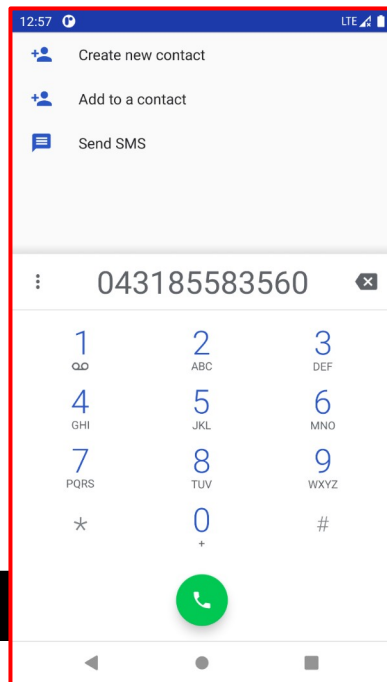


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```
public class MainActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        ImageButton imageButton = (ImageButton)findViewById(R.id.imageButton_phone);
        ImageButton imageButton1 = (ImageButton)findViewById(R.id.imageButton_sms);
        View.OnClickListener listener = new View.OnClickListener(){
            @Override
            public void onClick(View v) {
                Intent intent = new Intent();
                switch (v.getId()){
                    case R.id.imageButton_phone:
                        intent.setAction(Intent.ACTION_DIAL);
                        intent.setData(Uri.parse("tel:043185583560"));
                        startActivity(intent);
                        break;
                    case R.id.imageButton_sms:
                        intent.setAction(Intent.ACTION_SENDTO);
                        intent.setData(Uri.parse("smsto:+8615904318543"));
                        intent.putExtra("sms_body", "Welcome to CUST");
                        startActivity(intent);
                }
            }
        };
        imageButton.setOnClickListener(listener);
        imageButton1.setOnClickListener(listener);
    }
}
```

Intent filter

- **Implicit Intent doesn't specify the target Activity, and Android system employs Intent filter to find out the target Activity**

□ In AndroidManifest.xml, the components could register Intent filters with **<intent-filter>** tags

□ **action, <action>**

```
<action android:name="string"/>  
e.g., <action android:name="android.intent.action.MAIN"/>
```

□ **data, <data>**

```
<data android:scheme="string"  
      android:host="string"  
      android:port="string"  
      android:path="path"  
      android:mimeType="string"/>
```

android:scheme: specifies the protocol
android:host: the valid host
android:port: the valid port of the host
android:path: the path of accessing resource
android:mimeType: the datatype to be treated

□ **Category, <category>**

```
<category android:scheme="string"/>  
android.intent.category.DEFAULT  
android.intent.category.BROWSABLE  
android.intent.category.TAB  
android.intent.category.ALTERNATIVE  
android.intent.category.SELECTED_ALTERNATIVE  
android.intent.category.LAUNCHER  
android.intent.category.INFO  
android.intent.category.HOME
```

android.intent.category.PREFERENCE
android.intent.category.TEST
android.intent.category.CAR_DOCK
android.intent.category.DESK_DOCK
android.intent.category.LE_DESK_DOCK
android.intent.category.HE_DESK_DOCK
android.intent.category.CAR_MODE
android.intent.category.APP_MARKET
android.intent.category.VR_HOME

Demo



ZOOM IN

```
<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="com.example.intentfilter.MainActivity">
    <ImageView
        android:id="@+id/image"
        android:layout_width="100dp"
        android:layout_height="150dp"
        android:layout_centerHorizontal="true"
        android:scaleType="fitXY"
        android:src="@drawable/hehua"/>
    <Button
        android:id="@+id/btn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/image"
        android:layout_centerHorizontal="true"
        android:text="Zoom in"/>
</RelativeLayout>
```



Demo

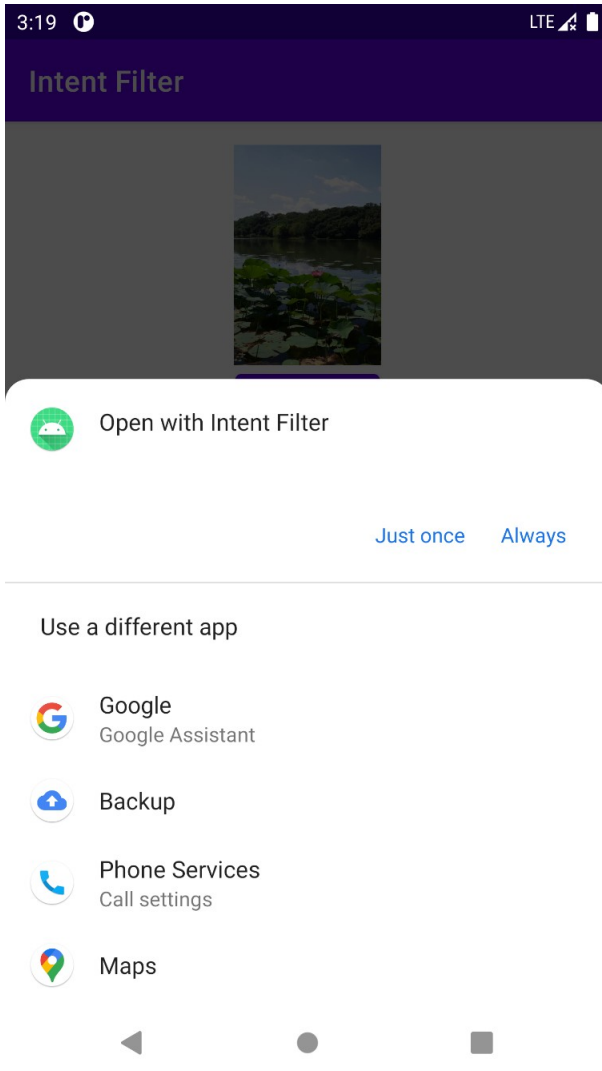


ZOOM IN

```
public class MainActivity extends AppCompatActivity {  
    @Override  
    protected void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.activity_main);  
        Button button = (Button)findViewById(R.id.btn);  
        button.setOnClickListener(new View.OnClickListener(){  
            @Override  
            public void onClick(View v) {  
                Intent intent = new Intent();  
                intent.setAction(Intent.ACTION_VIEW);  
                startActivity(intent);  
            }  
        });  
    }  
}
```



Demo



```
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.intentfilter">
    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportRtl="true"
        android:theme="@style/Theme.ActivityProgramming">
        <activity android:name=".ContactsActivity">
            <intent-filter>
                <action android:name="android.intent.action.VIEW" />
                <category android:name="android.intent.category.DEFAULT" />
            </intent-filter>
        </activity>
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>
</manifest>
```

Demo



```
<RelativeLayout 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"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".ContactsActivity">
    <ImageView
        android:id="@+id/image1"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:src="@drawable/hehua"
        android:scaleType="fitXY"/>
</RelativeLayout>
```

Demo



```
public class ContactsActivity extends Activity {  
    @Override  
    protected void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.activity_contacts);  
        getWindow().setFlags(WindowManager.LayoutParams.FLAG_FULLSCREEN,  
                               WindowManager.LayoutParams.FLAG_FULLSCREEN);  
    }  
}
```



Explicit Intent vs. Implicit Intent

- **Explicit Intent switches according to the package and class names of Activity**
 - **Implicit Intent switches through configuring Intent filter (Action, Category, Data)**
- **Explicit Intent is proper to invoke the Activity within the same app**
 - **Implicit Intent intends to invoke the Activity from the other app**
- **Explicit Intent requires to receive Activity package name and class name**
 - **Implicit Intent only needs one Action, then system will automatically list the mapped Activities for users to select**
- **Explicit Intent has higher effectiveness since it can precisely find out the component**
 - **Implicit Intent is less effective since the target Activity should be searched by Intent filter**

