Android Activity

Topics

- What is an Activity?
- Declaration of Activities in manifest file
- Activities and application
- Activity life-cycle
- Activity stack

What is an Activity?

What is an Activity?

- An activity presents a visual user interface (screen) for one focused endeavor the user can undertake.
  - For example, an activity might present a list of menu items users can choose from or it might display photographs along with their captions.
  - A text messaging application might have one activity that shows a list of contacts to send messages to, a second activity to write the message to the chosen contact, and other activities to review old messages or change settings.

Activity and Visual Content

- Visual content of the window is provided by a hierarchy of views
- Each view controls a particular rectangular space within the window.
  - Parent views contain and organize the layout of their children.
  - Leaf views (those at the bottom of the hierarchy) draw in the rectangles they control and respond to user actions directed at that space.
- Views are where the activity's interaction with the user takes place.
  - For example, a view might display a small image or button and initiate an action when the user taps that image or button.

How Visual Content is Presented?

- Each activity is given a default window to draw
  - Typically, the window fills the screen, but it might be smaller than the screen and float on top of other windows.
- A view hierarchy is placed within an activity's window by the *Activity.setContentView()* method.
  - The content view is the View object at the root of the hierarchy.

Activities and Application

Application is Made up with Activities

- An application might consist of just one or more Activities
  - > What the activities are, and how many there are depends, of course, on the application and its design.
- Typically, one of the activities is marked as the first one that should be presented to the user when the application is launched.
  - > Specified in the AndroidManifest.xml
- Moving from one activity to another is accomplished by having the current activity start the next one

How an Activity Launch Another?

- An activity is launched in two ways
  - *startActivity(Intent intent)* - Used when launching activity (calling activity) does not expect a result
  - *startActivityForResult(Intent intent)* - Used when launching activity expects a result
- The responding activity can look at the initial intent that caused it to be launched by calling its *getIntent()* method
  - (We have not learned Intent yet but think of Intent as a message that gets passed around between Activities)

Declaration of Activities in the Manifest file

What is Manifest File?

- Every Activity has to be declared in the Manifest file - otherwise “Activity Not Found” error condition occurs

```
<?xml version="1.0" encoding="utf-8"?>
<manifest . . . >
   <application . . . >
      <activity android:name="com.example.project.FreneticActivity"
             android:icon="@drawable/small_pic.png"
             android:label="@string/freneticLabel"
             . . .  >
      </activity>
      . . .
   </application>
</manifest>
```

Activity Lifecycle

An Activity has three states

- Active or running
  - > When it is in the foreground of the screen (at the top of the activity stack for the current task).
  - > This is the activity that is the focus for the user's actions.
- Paused
  - > If it has lost focus but is still visible to the user.
  - > That is, another activity lies on top of it and that activity either is transparent or doesn't cover the full screen, so some of the paused activity can show through.
  - > A paused activity is completely alive (it maintains all state and member information and remains attached to the window manager), but can be killed by the system in extreme low memory situations.

An Activity has three states

- Stopped
  - If it is completely obscured by another activity.
  - It still retains all state and member information.
  - However, it is no longer visible to the user so its window is hidden and it will often be killed by the system when memory is needed elsewhere.

State Transition Callback Methods

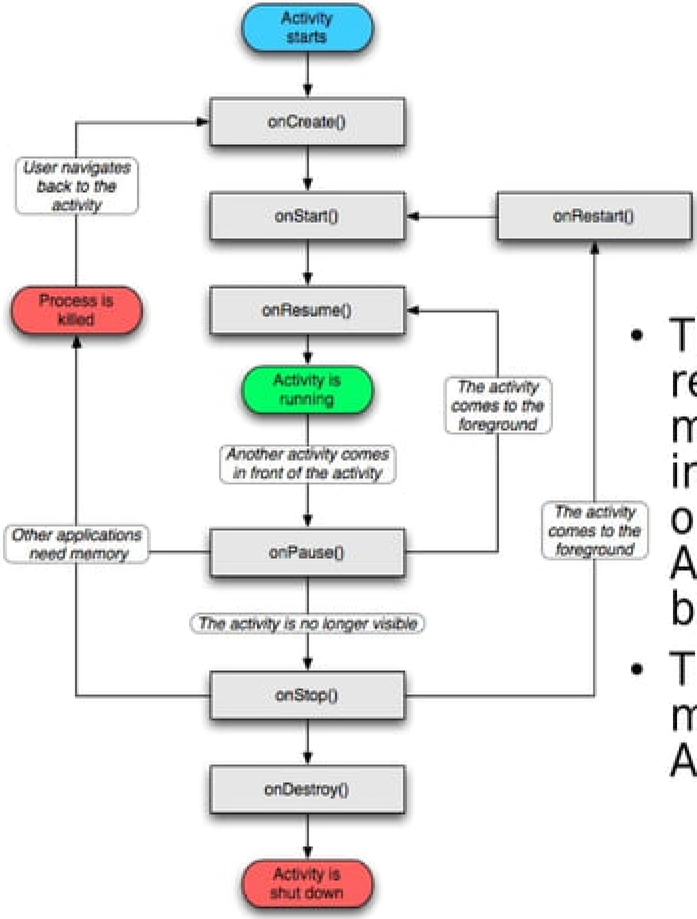
- As an activity transitions from state to state, it is notified of the change by calls to the following protected methods:
  - void onCreate(Bundle savedInstanceState)
  - void onStart()
  - void onRestart()
  - void onResume()
  - void onPause()
  - void onStop()
  - void onDestroy()
- All activities must implement *onCreate()* to do the initial setup when the object is first instantiated

onCreate()

- Called when the activity is first created.
- This is where you should do all of your normal static set up
  - > Create views, bind data to lists, and so on.
- This method is passed a Bundle object containing the activity's previous state, if that state was captured
- Always followed by onStart().

Lifecycle Lifetime

- Entire lifetime
  - Between the first call to onCreate() through to a single final call to onDestroy().
- Visible lifetime
  - Between a call to onStart() until a corresponding call to onStop()
- Foreground lifetime
  - Between a call to onResume() until a corresponding call to onPause()



Activity starts
onCreate()
User navigates back to the activity
onStart()
onRestart()
Process is killed
onResume()
Activity is running
The activity comes to the foreground
Another activity comes in front of the activity
Other applications need memory
onPause()
The activity comes to the foreground
The activity is no longer visible
onStop()
onDestroy()
Activity is shut down

- The square rectangles represent callback methods you can implement to perform operations when the Activity moves between states.
- The colored ovals are major states the Activity can be in.

Activity Stack

Activity Stack

- Activities in the system are managed as an activity stack.
- When a new activity is started, it is placed on the top of the stack and becomes the running activity
  - > The previous activity always remains below it in the stack, and will not come to the foreground again until the new activity exits.

Thank you