Android App Programming

Lecture 2: Intents
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Last lecture recap
• Dynamically generated class during compilation

• Links XML layout files to Java

• Contains all assets of the application (layout files, images, strings, etc.)

• Field names defined in layout editor

• Ex: R.id.toolbar
Activities

- Single block of user interaction
- In the simplest case, one screen
- Can be a window or part of the screen
- To display something, set its content:
  - `setContentView(View)`
Views

• Basic UI component

• E.g., Button, TextView, ImageView, menus, etc.

• Has a set of mutable properties (e.g., text size)

• Can register listeners:

  • `button.setOnClickListener(this);`
Intents
Intents

- Mechanism to launch activities from other activities

- To change activity: need to create object of type Intent, then call the method startActivity with that object

- ex:
  ```java
  Intent i = new Intent(this, OtherActivity.class);
  startActivity(i);
  ```
Bundles

- Mechanism to pass data to activities: **Bundles**
- Can put data in and retrieve it
- ex:

  ```java
  bundle.putFloat("pi", 3.14);
  bundle.getFloat("pi");
  ```
Passing Data between Activities

• Every `Intent` has an “extra” bundle

• Access via `putExtra` or `getExtra`

• Put extras in the sender activity, get it in the receiver activity

• Inverse direction: `startActivityForResult`
  
  • need to implement `onActivityResult` in caller

  • need to call `setResult` in `finish` method in callee
Activity Lifecycle

• Activities are either:
  • foreground
  • visible, but not foreground
  • neither

• Activities that are not foreground can be killed by the system to free resources (priority to non-visible)
Activity launched

onCreate()
onStart()
onResume()
onRestart()

User navigates to the activity

App process killed

Another activity comes into the foreground

User returns to the activity

Apps with higher priority need memory

onPause()

The activity is no longer visible

User navigates to the activity

onStop()

The activity is finishing or being destroyed by the system

onDestroy()

Activity shut down
Activity Lifecycle

- Activities that are killed and restarted come with their initial state (as defined in `onCreate`)

- To save and restore some dynamic state, the methods `onRestoreInstanceState` and `onSaveInstanceState` are called by the system upon creation/destruction

- Both have a `Bundle` as parameter
Coding demo
Lab 2

1. Simple app with 2 activities

2. Redo last week’s game with multiple activities
Advance reading

• Next topic:

• Web services

• https://www.androidauthority.com/use-remote-web-api-within-android-app-617869/
Questions