Mobile Application Development

Lecture 5: Android Project Structure and Lifecycle

Course Lecturer: Menard Phiri, Dept of CSIT, MUST

Lesson outcomes

- Understanding Android project structure
- Understanding Android lifecycle

ANDROID PROJECT STRUCTURE

app/	contains files about the entire app
app/build/	holds the application once it is compiled
app/src/	Contains all code and resource files for the app
app/src/androidTest/	Contains code for instrumentation tests.
app/src/main/	Contains the main source files of the app
app/src/main/AndroidManifest.xml	declaration of components used by the app
app/src/main/java/	Contains Java code sources.

ANDROID PROJECT STRUCTURE CONT.

app/src/res/	Contains app resources, e.g drawables, layout files
app/src/assets/	Contains files that are compiled into an .apk file as-is.
app/src/test/	Contains code for local tests that run on your host JVM.
build.gradle (app)	This defines the module-specific build configurations.
build.gradle (project)	This defines your build configuration that apply to all modules.

Introduction to activities

- Android programs have no main() method
- Every Android App starts in an Activity
- An activity provides the window in which the app draws its UI.
- One activity implements one screen in an app.
- At least one activity must be the main activity

Introduction to activities cont.

- Any activity can call another activity to perform different actions.
- Each activity must be register information about them in the app's manifest file.
- Each activity must at least have an onCreate() method that specifies the behavior of the app

The activity lifecycle

- An Android app uses states to determine what to do.
- An activity transitions between seven stages of lifecycle
- The parent Activity class provides a core set of seven callbacks that should be overridden to drive the expect behavior:
  - –onCreate()
  - –onStart()
  - –onResume()
  - –onPause()
  - –onStop()
  - –onRestart()
  - –onDestroy()

The onCreate() Method

- This is invoked when the system first creates an activity.
- As such, this is must implement basic application startup logic for the activity.
- This method receives the parameter a Bundle object, called savedInstanceState, containing the activity's previously saved state.
- If the activity has never existed before, the value of the Bundle object is null.

The onSTART() method

- This is invoked when the activity enters the Started state
- It makes the activity visible to the user.
- It prepares the activity to enter the foreground, become interactive and completes very quickly.
- Once it finishes, the activity enters the Resumed state

The onRESUME() method

- This is invoked when the activity enters the Resumed state and it is visible on the foreground.
- This is the state in which the app interacts with the user.
- The app stays in this state until something happens to take focus away from the app.

THE ONPAUSE() METHOD

- The system calls this method as the first indication that the user is leaving your activity
- This event does not imply that the activity is being destroyed
- It indicates that the activity is no longer in the foreground.

THE ONSTOP() METHOD

- This is invoked when the activity is no longer visible to the user.
- This may happen because the activity is being destroyed or a new activity is starting.
- In all of these cases, the stopped activity is no longer visible at all.

THE ONRESTART() METHOD

- The system invokes this callback when an activity in the Stopped state is about to restart.
- The onRestart() restores the state of the activity from the time that it was stopped.
- This callback is always followed by onStart().

THE ONDESTROY() METHOD

- The system invokes this callback before an activity is destroyed.
- This callback is the final one that the activity receives.
- It is usually implemented to release activity's resources when the activity is destroyed.