Mobile Application Programming: Android Services
Activities

- Apps are composed of activities
- Activities are self-contained tasks made up of one screen-full of information
- Activities start one another and are destroyed commonly
- Apps can use activities belonging to another app
Application
Application Controller (MVC)
Services

- An application component that can perform **long-running operations in the background** and does not provide a user interface.

- Can be **started and potentially run indefinitely** or be **bound to and run until the operation the service provides is no longer needed**.

- Apps can **use services belonging to another app**

- Can be **unbound or bound**
Unbound Services

- Started by calling `startService`
- Can potentially run indefinitely
- Meant to allow a background task to run to completion, even if the application is closed
  - Compare to AsyncTask
- Should start a new thread to perform work, as `onStartCommand` is executed on the main thread
  - See IntentService for queueing
Unbound Services

- **Communication is limited**: the only communication between the starting application component and service is through `Intent` passed to `onStartCommand`

- Add `PendingIntent` objects as extras to the `Intent` object passed to `onStartCommand` to allow the service to broadcast results to the starting application component

- When more complicated communication is needed between the service and the starting application component, use a **bound service**
Bound Services

- Binding to a service by calling `bindService` allows another application component (e.g., Activity) to communicate with it.

- `bindService` requires a `ServiceConnection` object, which contains an `onServiceConnected` method.

- When `onServiceConnected` is called, an object conforming to `IBinder` is returned. This object can be used to communicate with the service.

- If the bound service and the binding application component are in the same process, the `IBinder` object can share a pointer to the service itself, making communication very easy by using public methods defined on the service.
Bound Services

- Binding to a service starts the service if it has not already been started by a previous call to bindService or startService.

- Bound services started by bindService run until all clients of the service call unbindService.

- Bound services that were originally created by a call to startService run until stopService is called by the client or stopSelf is called by the service on itself.
Services in MVC

Activity

Service

Activity

Activity