Mobile Applications

• **Front end**
  • Native code on the phone/tablet
    • Java for Android
    • Swift for IOS
    • C# for Windows
  • Using built in widgets
  • Using APIs to access functionality

• **Back end**
  • Web-accessible
  • Basically the same as a web application
Why Write Multiple Front Ends

• **Pros**
  - They will look slightly different (look like native applications)
  - They will use different UI capabilities (interactions)
  - They will use different phone capabilities

• **Cons**
  - Most of the functionality is the same
  - Most of the capabilities on one platform exist on others as well
  - Want your application to be about the same on all platforms
Alternative: Write a Web Application

- Front end is HTML, CSS and JavaScript
  - Needs to be responsive to handle different sizes
  - Can provide different functionality based on platform
  - Most of the technologies are available through HTML
    - Geolocation, camera, sound, ...
- A web application can be packaged to look like a native app
  - Screen icon, with click to start
  - Packaging tools exist and are easy to use
- Disadvantages
  - Performance is not as good as a native app
  - Can’t access latest OS features
  - Interface might not look native
Alternative: Write Once

• The target platforms are quite similar
  • Languages, APIs, capabilities
• Write the front end in language X for some X
  • Using a fixed set of libraries
  • Compile X into Java/Swift/C#/...
    • Map library calls to library calls on native platform
• Generate multiple applications from a single source
• Still need to determine how to specify UI
Xamarin: C#

• Xamarin lets you write the app in C#
• Using a standard UI library
• Using libraries to access native APIs
• Available for Windows (VS) and Mac development
  • Community (free) edition or Enterprise (paid)
NativeScript: JavaScript

• Write the front end in JavaScript
  • With a static description of the user interface
• Have that generate native code for
  • Apple, Google, ...
• Demo:
  https://www.youtube.com/channel/UCORcUyJOXjF4PbwCP6R6dGw
  https://www.youtube.com/watch?v=N8zsFIVdLwY
Next Time

- Future of Web Applications (discussion)
- Answer questions re final projects