Introduction to Mobile Apps

CSE 5236: Mobile Application Development
Instructor: Adam C. Champion, Ph.D.
Course Coordinator: Dr. Rajiv Ramnath
Reading: *Big Nerd Ranch Guide*, Chapter 1
Essence of A Mobile Device?

• (Potentially) available to serve everywhere, any time.
• Interwoven into daily life – live, work, play, study
• Represents and intimately “knows” the user
  – Much more than just a small computer, it represents the user
• Brings in the outside world – sensing, location, communication
• Now the dominant end-user device
Varied Shapes, Sizes, Capabilities

Sources: Apple, Google, Nintendo, Samsung
Mobile Application Development Challenges

- Competitive, fluid vendor landscape (Apple, Android consortium incl. Amazon, RIM, HP) means apps need to be multi-platform for wide adoption
- No “standard” device (what about iOS, Windows Phone devices?)
- Low bandwidth input (in most cases – what about tablets?)
- Limited screen size (tablets?)
- Unreliability in connectivity and device (network access, power, ambient light, noise, at least for now)
- Integration tradeoffs with cloud and enterprise services
Application Development Support

- 3rd Generation Object-Oriented Languages (iOS – Objective C, Android – Java, Windows Phone – C#)
- Scripting languages (JavaScript, Ruby)
- Cross-platform frameworks – Titanium, RhoMobile, Xamarin, PhoneGap
- C and C++
- Integrated into “frameworks” specifically for mobile application development
Framework Support (e.g., Android)
Framework Capabilities and Add-Ons

• Built-In Services:
  – GUI
  – OS services (file I/O, threads, device management)
  – Graphics
  – Device access (GPS, camera, media players, sensors),
  – Networking
  – Standard language libraries

• Add-ons:
  – Google Play services (e.g. Google Maps, Games, etc.)
  – Database support (SQLite)
  – WebKit/Chromium
# Tooling Support

<table>
<thead>
<tr>
<th>Tool Type</th>
<th>Android Support</th>
<th>iOS Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open-source Integrated Dev. Environments (IDEs)</td>
<td>Android Studio</td>
<td>–</td>
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<tr>
<td>Proprietary IDEs</td>
<td>IntelliJ IDEA</td>
<td>Xcode</td>
</tr>
<tr>
<td>Testing tools</td>
<td>JUnit, Espresso</td>
<td>XCUnit</td>
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<tr>
<td>Profiling tools</td>
<td>Android Profiler</td>
<td>Xcode Instruments</td>
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<tr>
<td>Source code management</td>
<td>Git, Subversion, CVS (for both Android, iOS)</td>
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<tr>
<td>Software emulators</td>
<td>Android Emulator, Intel HAXM (x86), Genymotion</td>
<td>iPhone Simulator</td>
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<tr>
<td>Sensor injection tools</td>
<td>Built into emulators (for both Android, iOS)</td>
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</tbody>
</table>
Thank You

Questions and comments?
Framework Support (e.g., Android)

Blue background: Java
Other colors: C/C++