Lesson 1

Introduction to mobile and social computing
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- Mobile designer and developer since 2009
- GDG Cosenza manager
- Teacher for University and companies

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Course goals
• Strong Know-how about mobile design and development
• Build complex and fully-featured Android applications
• How to develop on the iOS platform
• Use the social networks to improve your Apps

Final Exam
• Build a complete Android mobile application (iOS ?) alone or in a small group
• Oral examination about the course topics and the project build.
About the tutoring

The tutoring (~ 36 hours) will be divided into:

- Android development
- Introduction to iOS development
- Social network
- Introduction to the different mobile platforms
Lesson 1 - Topics

- Mobile world, today
- How to choose a mobile platform
- How to create an App
- How to start developing
Mobile world, today

• There are more connected mobile devices than people on earth
  One years ago: 7,22 billions of mobile device connected versus 7,2 billions of people on earth

• Mobile devices overtook desktop/laptop devices on consumption of data traffic
  • Web
  • E-commerce
  • Social network
  • Multimedia
  • Gaming
  • Advertising
Mobile world, today

- The main actors in the world of the mobile operating systems

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Mobile world, today

Source: https://netmarketshare.com

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<th>ANDROID</th>
<th>IOS</th>
<th>WINDOWS PHONE</th>
<th>SYMBIAN</th>
<th>JAVA ME</th>
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Native

- Use the official platform SDK and the development language (i.e. Java for Android, Objective-C or Swift for iOS, etc…)
- No code reused for multi-platform applications
- Better user experience (UI and performance)
- All platform features are available
Development approaches

Cross-platform

- Multi-platform applications are written with a single language (ie. Javascript, actionscript, C#) and compiled/built for each platforms
  - Ionic: http://ionicframework.com/
  - AppAccelerator: http://www.appcelerator.com/
  - Xamarin: https://xamarin.com/
- Code reuse (~ 80%)
- Not good user experience
- Not all features are available
- Stability problems during platform upgrade

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Limits of the mobile development

- One single application active
  - Applications can run in background but their behaviours are limited (in time and resources)

- An application runs in a single and fixed window
  - A limited set of devices are trying to go beyond this limit

- Mobile applications have limited resources
  - i.e. memory, display, battery and so on...

- Applications have a well defined lifecycle

- For security reasons, applications run in a sandbox with specific permissions granted by the user
Which mobile platform?

**Android**

- Is the most diffused mobile OS
- Development is free
  - Open-source
  - Documentation, tutorials and guides are public access
  - SDK, IDE and tools are available for free for all desktop os (windows, osx, linux)
- To distribute via Play Store a license is required (about 35$ una tantum) but it is facultative.
  - Alternative markets
- Development based on well-known technologies
  - Java & XML
  - C/C++ for native development (Android NDK)
- Android system is evolving constantly
iOS

- Is the most remunerative OS
- Is a closed platform
- Development is expansive
  - Documentation, tutorials and guides are public access, but
  - IDE and tools are available only for the latest versions of Mac OS X
- Subscription to the Apple developer portal costs 99€/year and it is mandatory to distribute applications via AppStore
- Development is based on specific languages
  - Objective-C and Swift
- Devices are expansive
- iOS ecosystem is evolving constantly
Android and iOS ecosystems

• From mobile to pervasive computing
Create an App

• How to evaluate if an idea is so good to spend time and money in its development?

• The idea is valid if:
  • users have a **reason why** to download it
    • Give exclusive functionalities and contents
    • Resolve a specific problem in a simple way
    • Could be necessary for specific activities
  • take advantage of mobile device features
    • Geolocation
    • Push notifications
    • Mobility

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Create an App

- There are different categories of mobile applications
  - Health
  - Productivity
  - News
  - Social networking
  - Multimedia
  - Gaming
- Each of this categories has specific features and behaviours
- Take a look about competitors
  - Is there an App like mine?
  - Why is my App better than its competitors?
Getting started with iOS

- Official documentation

- Udacity online free course (~ 24 hours)

- Free swift 2.1 ebook

- Other books
  http://www.amazon.it/iOS-Programming-Fundamentals-Swift-Basics/dp/1491936770/
Getting started with Android

- Official documentation
  http://developer.android.com/

- Udacity free access course material
  - https://www.udacity.com/course/android-development-for-beginners--ud837
  - https://www.udacity.com/course/developing-android-apps--ud853

- Almost all books are focused on Android 4.0. They are a good point to start development, but more changes will be introduced in Android 6.0 Marshmallow.
Getting started with Android

- IDE and developing tools

Android Studio
- Android Studio IDE
- Android SDK tools
- Android 6.0 (Marshmallow) Platform
- Android 6.0 emulator system image with Google APIs

DOWNLOAD ANDROID STUDIO FOR MAC

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Getting started with Android

- Android Build System (adb)
  - Toolkit used to compile, test and run applications
  - Before this task are based on ANT, now is based on Gradle extension for Android
  - The build files are named build.gradle
    - There are one file for the project and one for each module
    - Groovy syntax
    - Define all features and dependencies of project and modules. It also allow to add business logic during build time.

- References
  - http://www.gradle.org/
  - http://groovy.codehaus.org/
Run your application

- **Device**
  - It is recommended to have a real device
  - Cheap devices are ok, but certified by Google and with android 4.0 or above

- **Emulator**
  - Android Emulator
    - Official emulator with all features enabled (i.e. google play services)
    - Can emulate smartphone, tablet, wear, tv
    - Good performance only with high-performance PCs
  - Genymotion
    - Third part emulator, free to use (with personal license)
    - A small set of smartphone and tablet emulated (no wear or tv)
    - Very good performance [https://www.genymotion.com/](https://www.genymotion.com/)
Run your first Android Application

Install and configure Android Studio

From Quick Start menu choose:

- Start a new Android Studio project

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Run your first Android Application

Fill the form and press the Next button.
Run your first Android Application

Choose the target of the App and press the Next button

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Run your first Android Application

Choose a template, i.e. a Scrolling Activity

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Run your first Android Application

Fill the form and press the Finish button
Run the application, clicking the play button in the toolbar near the module name.
Run your first Android Application

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Run sample applications

- From Quick Start menu choose:
  - Import an Android code sample

- This task required internet connection!
Run sample applications

Choose an example and press Next button
Clicking the finish button, the code will be download from the repository to the Project location defined and automatically loaded into the IDE.
Create a repository for your projects

- Version control system (like git, svn, mercurial)
  - Help distributed development (i.e. merging codes)
  - The code is protected from accidental damages
  - Version control system helps developers to control the code growing, and allow to go back to previous versions (if it's necessary)

- Android Studio contains an integrated git client

- Bitbucket offers unlimited free and private repositories
  [https://www.bitbucket.org](https://www.bitbucket.org)