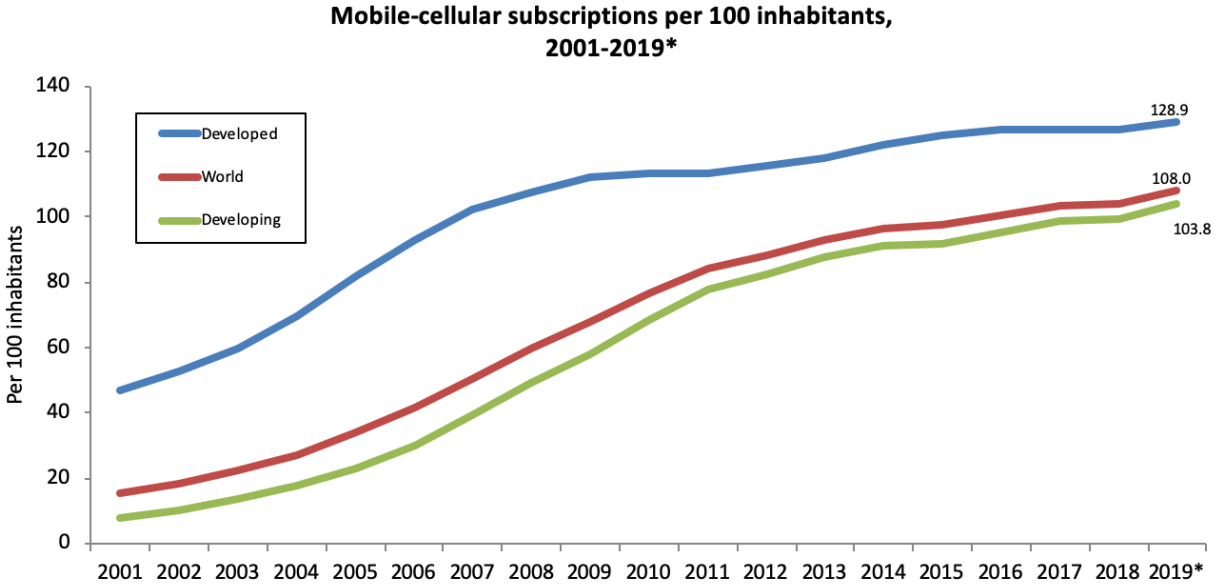
Overview

ICT2105 Mobile Application Development

Jeannie S. Lee

Spring 2020

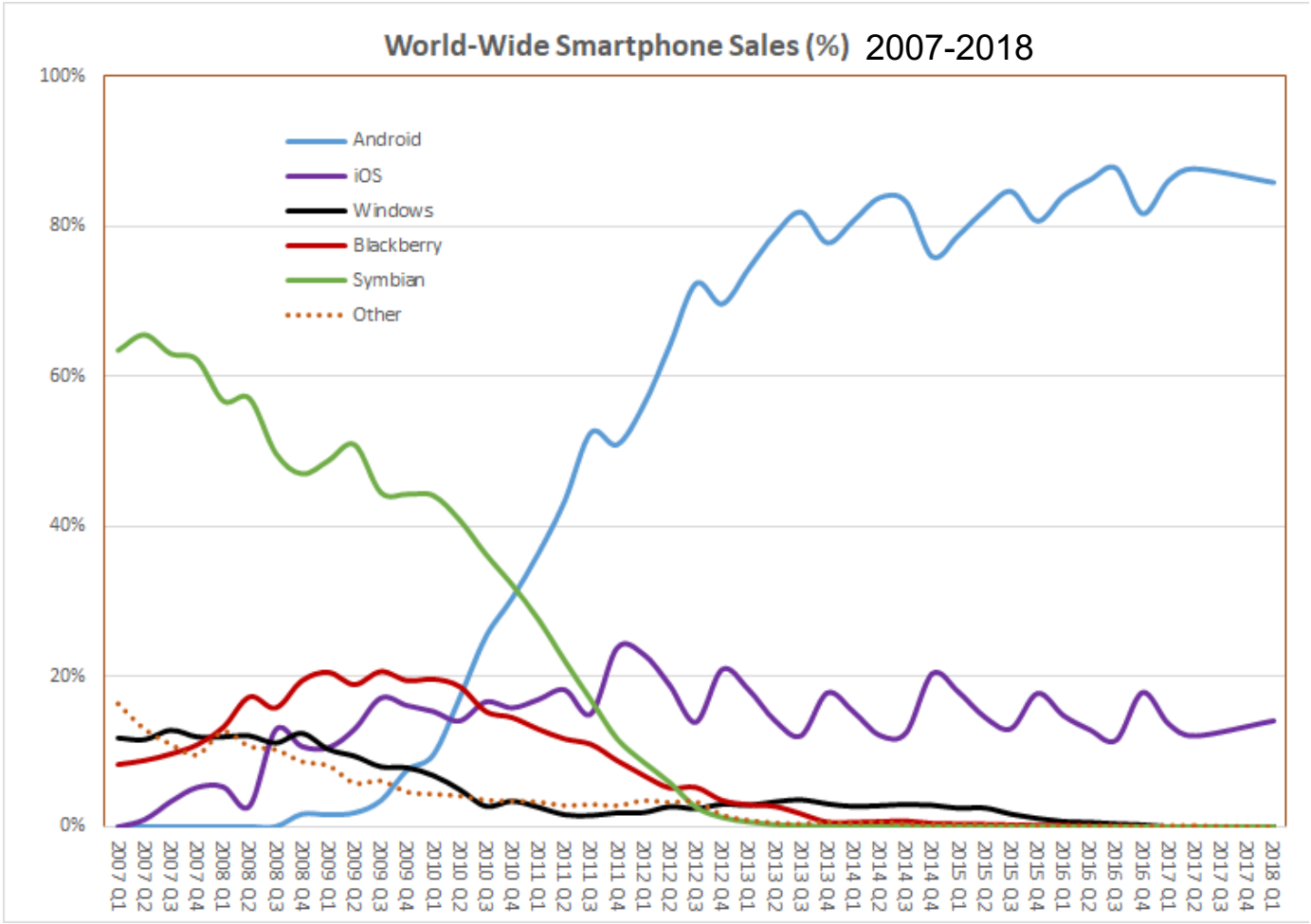
Mobile-cellular subscriptions per 100 inhabitants



The developed/developing country classifications are based on the UN M49, see:
http://www.itu.int/en/ITU-D/Statistics/Pages/definitions/regions.aspx.html
Note: * Estimate
Source: ITU World Telecommunication /ICT Indicators database

- By end 2015, there are more than 7 billion mobile cellular subscriptions, corresponding to a penetration rate of 97%, up from 738 million in 2000
- Between 2000-2015, global Internet penetration grew 7 fold from 6.5% to 43%
- Mobile broadband is the most dynamic market segment; globally, mobile-broadband penetration reaches 47% in 2015, a value that increased 12 times since 2007
- The proportion of households with Internet access at home increased from 18% in 2005 to 46% in 2015
- Fixed-broadband uptake is growing at a slower pace, with a 7% annual increase over the past three years and reaching 11% penetration by end 2015
- The proportion of the population covered by a 2G mobile-cellular network grew from 58% in 2001 to 95% in 2015

http://www.itu.int



Wikipedia: http://upload.wikimedia.org/wikipedia/commons/a/ac/World_Wide_Smartphone_Sales_Share.png

Mobile Device Popularity

- **>300,000** Mobile apps developed in three years (2007–2010)
- **$1 billion** Mobile startup Instagram's value within 18 months
- **1.1 billion** Mobile banking (*m-banking*) customers by 2015
- **1.2 billion** Mobile broadband users in 2011
- **1.7 billion** Devices shipped in 2012 (an increase of 1.2 percent over 2011)
- **6 billion** Mobile subscriptions worldwide (China and India account for 30 percent)
- **$35 billion** Estimated value of app downloads in 2014
- **76.9 billion** Estimated number of app downloads in 2014
- **$1 trillion** Mobile payments (*m-payments*) estimated in 2015
- **8 trillion** Estimated number of SMS messages sent in 2011

Why is mobile interesting?

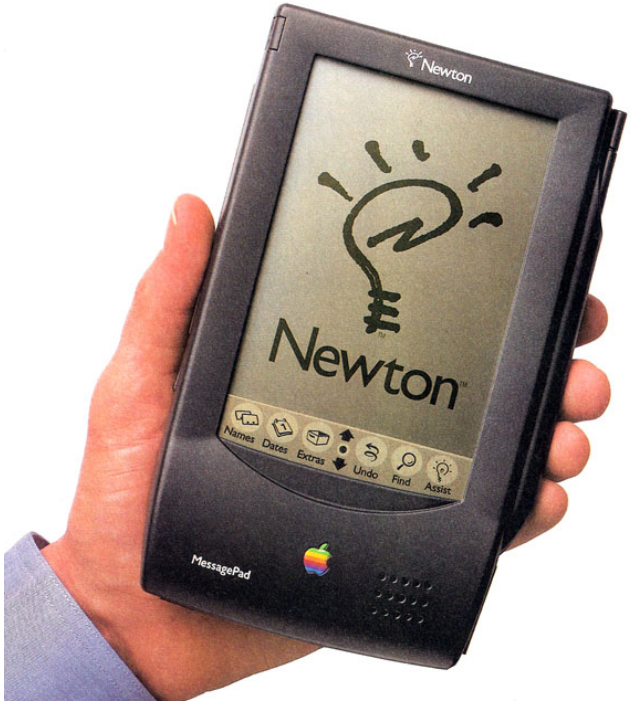
Increasing mobile adoption worldwide

Recent developments in computing happened in the mobile domain
E.g. HoloLens, Google Glass, wearables, mobile devices

First handheld mobile phone from Motorola

Demoed by Dr. Martin Cooper (Motorola), weighs 4.4lb (2kg!)

First commercial phone: Motorola DynaTAC 8000x (1983)


Newton
Newton
Names
Dates
Extras
Undo
Find
Assist
MessagePad


Alphabet Graffiti (.) Ce point indique le point de départ.
PalmVx
Général
Préférences
Régler l'heure: 4:22
Régler la date: 6/1/00
Auto-arrêt après: 2 minutes
Activé dans la station:
Son du système: Fort
Son de l'alarme: Fort
Son des jeux: Fort
Réception IR: Oui
PalmV
3Com
1:08
Toutes
Adresses
Agenda
Bienvenue
Bloc-notes
Calc
Courrier
Dépenses
Graffiti
HotSync
Préf.
Sécurité
Tâches
Old-organizers.com

What goes on inside them?

What is this course about?

Principles and concepts for programming on a mobile platform

Software architecture and components of common mobile platforms e.g. Android & iOS

Designing, coding and testing a mobile application in Android

Developing a real-world, working mobile application!

Course Details

Module Pre-requisites

ICT1009 Object-Oriented Programming

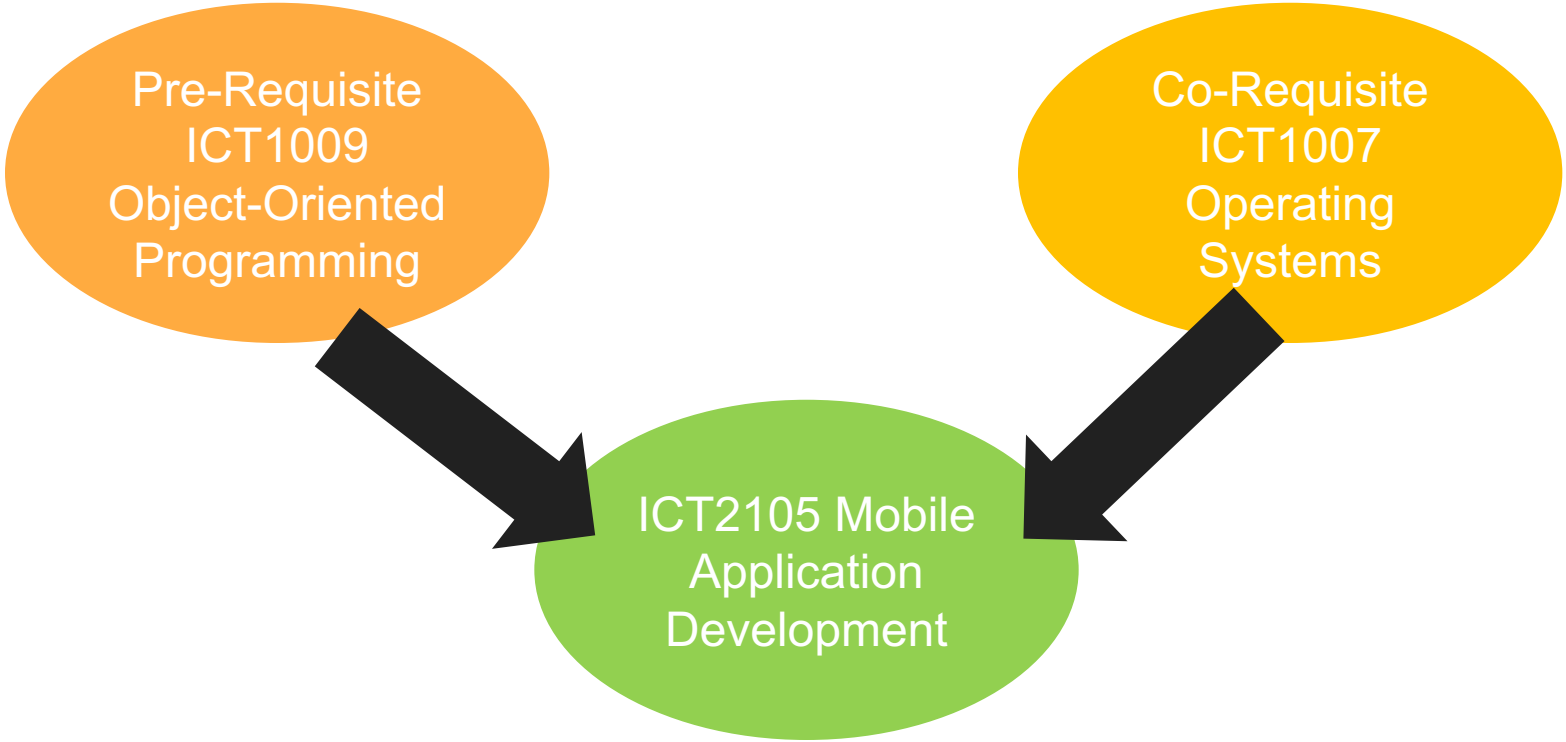
Module Co-requisites

ICT1007 Operating Systems

Module Prerequisite for

<none>

Pre-Requisites & Co-Requisites



Required Knowledge Areas

Programming Fundamentals

Object-Oriented Programming

Operating Systems

Human-Computer Interaction

Networking & Web

Computer Architecture

Data Structures & Algorithms

Databases (aka Information Management)

Topics*

Mobile Platform Stack & Components (mostly Android)

UI Design & Considerations

Application Fundamentals & Dev Environment

Activity, Layouts, Fragments, UI Classes

Intents, Broadcast Receivers, Binder/AIDL

Content Providers, Databases

*Tentative and subject to change

Topics*

Threading

Services

Networking, JSON, HTTP, REST

NDK & Native Development (Advanced)

AR, VR & Gaming (TBD)

Firebase Cloud Messaging (FCM) (TBD)

*Tentative and subject to change

Learning Outcomes

Describe the core components of a mobile operating system, platform and the associated development tools

Explain the differences between mobile and desktop platforms and their complexities and issues

Understand the primary unique aspects of mobility and use them to create new mobile software features

Apply object-oriented knowledge to implement, modify or extend existing mobile software components to create reusable services and components

Design, implement and test a complete mobile application

Course URLs

LMS (xSite)
https://xsite.singaporetech.edu.sg/d2l/home/39360

Github
https://github.com/sgtech-ict2105/

Slack
https://ict2105.slack.com

Facebook
https://www.facebook.com/ict2105/

Lectures & Practical Sessions

Lectures

Monday 9am to 11pm (2 hours)

NYP-SR6H

SHORT LUNCH BREAK

Practical Sessions (Labs)

Monday 12pm to 3pm (3 hours)

NYP-SR2A & NYP-SR4A

Starting on Week 2

Ground Rules

Lectures and practical sessions will start on time

If there are questions, do ask

5-10 mins break after every 45 mins - 1 hr of lecture (only if time permits)

Be considerate to other students

No talking or snoring

Keep all mobile devices in silent mode (Ironic, I know.)

Assessments

Assessment Item	Weight
Exercises & Quizzes (In-Lecture)	10%
Lab Exercises	10%
Lab Programming Practical Quiz	40%
Team Project + Peer & Individual Appraisal	40%
Exam (None! Yay!!)	0%
Total	**100%**

Assessments

Exercises & Quizzes

Conducted during lectures

Lab Exercises

Submission the week after the practical session

Lab Programming Practical Quizzes

Individual programming question; conducted during practical sessions

Team Project

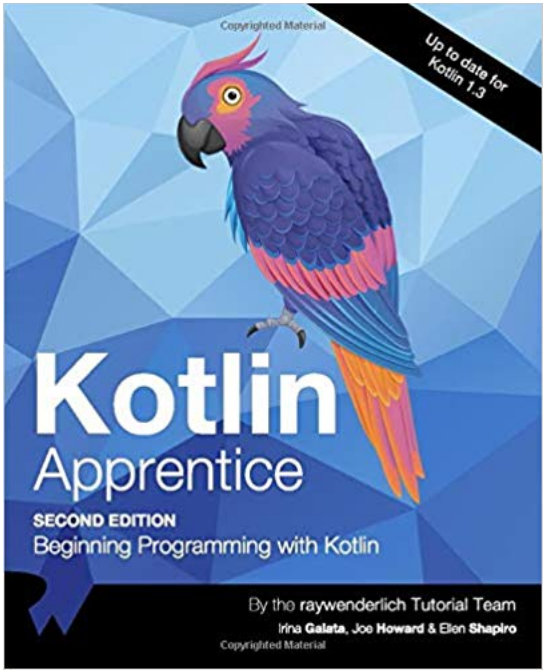
Semester long implementation of a real, working mobile application

Some deliverables during the semester

Requires submission of the working code and a report

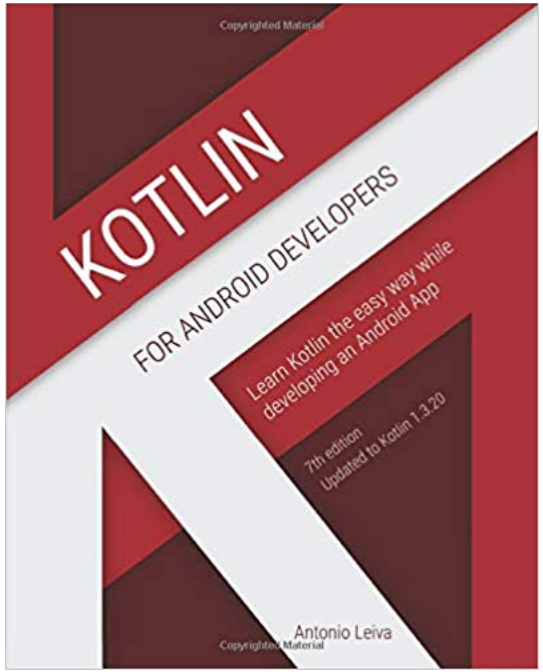
Reference Book

I. Galata, E. Shapiro & J. Howard, **Kotlin Apprentice,** Razeware, 2019.



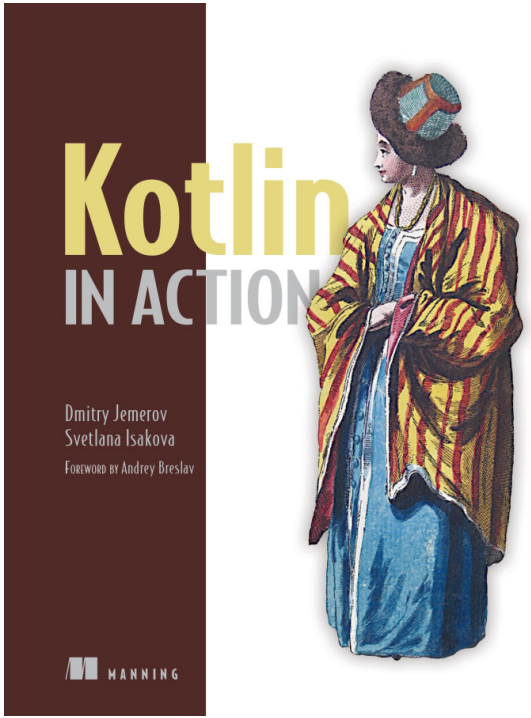
Reference Book

A. Leiva, **Kotlin for Android Developers,** CreateSpace, 2016



Reference Book

D. Jemerov & S. Isakova,
Kotlin in Action, Manning,
2017.



Online Resources

Android Development Information
http://developer.android.com

Android Developer's Guide
http://developer.android.com/guide

API Reference:
http://developer.android.com/reference/packages

Online Resources

Android Design
http://developer.android.com/design

Android Open Source Project (AOSP)
http://source.android.com (Operating system source code!)

More Online Resources

Stack Overflow Q&A

http://stackoverflow.com/questions/tagged/android

Developer Support Resources

https://developer.android.com/support

More Online Resources

Google Developers

http://developers.google.com

Android Blog

https://android-developers.googleblog.com/

Announcements

Labs start on Week 2

All labs on **Mondays 12pm – 3pm**

Group 1: NYP-SR2A, Group 2: NYP-SR4A

- Lab 3 on Week 4 Mon Jan 27 to be rescheduled due to CNY (TBD)
- Lab 1 & 2 to be released ahead of time

Announcements

- Join the ICT2105 Slack & GitHub groups https://ict2105.slack.com/signup
- Double confirm your github userid: http://bit.ly/36skEjg
- Form a project team (By lab group ONLY): http://bit.ly/2ZRWNaI
- Get hold of an Android phone, equipment loan: http://bit.ly/2ZPIgvV
- Email: stella.chan@singaporetech.edu.sg if any questions
- Lab 0: Install Java, Android Studio, the Android SDK (Do at home!)

Due date: Friday Jan 10, 2020, 2359 hrs

Any questions?