Mobile & Wearable Computing

P01: Introduction to the Android Programming Project (APP)

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Changelog

- V1: October 3, 2025
  - Update from 2024 version

Android Programming Project (APP)

- What?
  - Design and implement a mobile application in Android
- Who?
  - You & your team
  - 1 team, 1 project!
- Why?
  - Because programming must be learned hands-on!
- When?
  - Start: Friday, October 03, 2025
  - End: Tuesday, December 19, 2025

11 weeks!

Goals of the class project

- Gain **hands-on experience with Android programming**

- Apply the concepts learned during the tutorials and the lectures
  - Choosing sensors and understanding the data they provide
  - Storing data (locally/remotely)
  - Designing a good user interface
  - Visualizing data
  - Making sense out of the data

Image source: http://blog.doolphy.com/2015/09/

What should the app actually do?

- The app should execute a specific, well-defined task
- The app should solve a problem for the user – or “just” be fun to use!

- The app can be (doesn’t have to be, though) a “stepped-up” version of the StepApp app programmed throughout the tutorials

Ideas for improving the StepApp

- Better step counting
  - Focus on quality of sensing & processing
  - It must be proven that new app is better than old app, though…
- Data visualization
  - Nicer/richer plots
- Interaction with the user
  - Focus on design of the experience and of the interface
- Feedback to the user
  - Timely/funny notifications
- Features
  - Add calorie counting along with step counting
  - Add login screen

Requirements (must have!)

- Your APP *must* fulfill the following requirements:
  - Use **at least two sensors** available on mobile devices
    - One is already used in the StepApp app: the accelerometer
    - Other sensors: GPS, microphone, light sensor, etc.
    - Wi-Fi or other communication interfaces can also be used as a sensor
  - **Store the collected sensor data**
    - Locally and/or remotely
  - **Visualize the data** for the user
    - Using plots, summaries, metaphors, …
    - Provide some feedback to the user about the collected data
  - Show that the **UI has been designed according to the guidelines** discussed in the lecture about mobile user interfaces (L04)

APP: Work in groups!

- You must form **groups of 2-3** students

- Please **complete the iCorsi form** – by **Friday, October 10** – indicating:
  - Team name
  - For each group member:
    - First name
    - Family name
    - E-Mail address
  - Link to the repository where you plan to upload the code and documentation of your project

Next steps?

- Inspiration?
  - Think about an actual problem a mobile app can solve
  - Talk to people
  - Look in the App Store / Google Play
- Deliverables
  - Project description & Storyboard
  - Mid-term project review
  - Final project presentation
  - Final project report & code upload

"*The creation of something new is not accomplished by the intellect but by the play instinct acting from inner necessity. The creative mind plays with the objects it loves.*"
Carl Jung
Swiss psychologist (1875 - 1961)

Timeline and deliverables

Date	Topic
Fri, Oct 3	Introduction to the Android Programming Project
Fri, Oct 10	Deadline to notify TAs about group composition
Fri, Nov 7	Submission of project description and storyboard
Fri, Nov 11-14	Initial project reviews
Tue, Dec 2	Mid-term project reviews
Mon, Dec 15	Submission of final project report + code upload
Tue, Dec 16	Final project presentations*
Fri, Dec 19	Final deadline for code updates

- All deliverables (incl. slides) must be uploaded to iCorsi
- All deadlines are 7:00 p.m. Lugano time

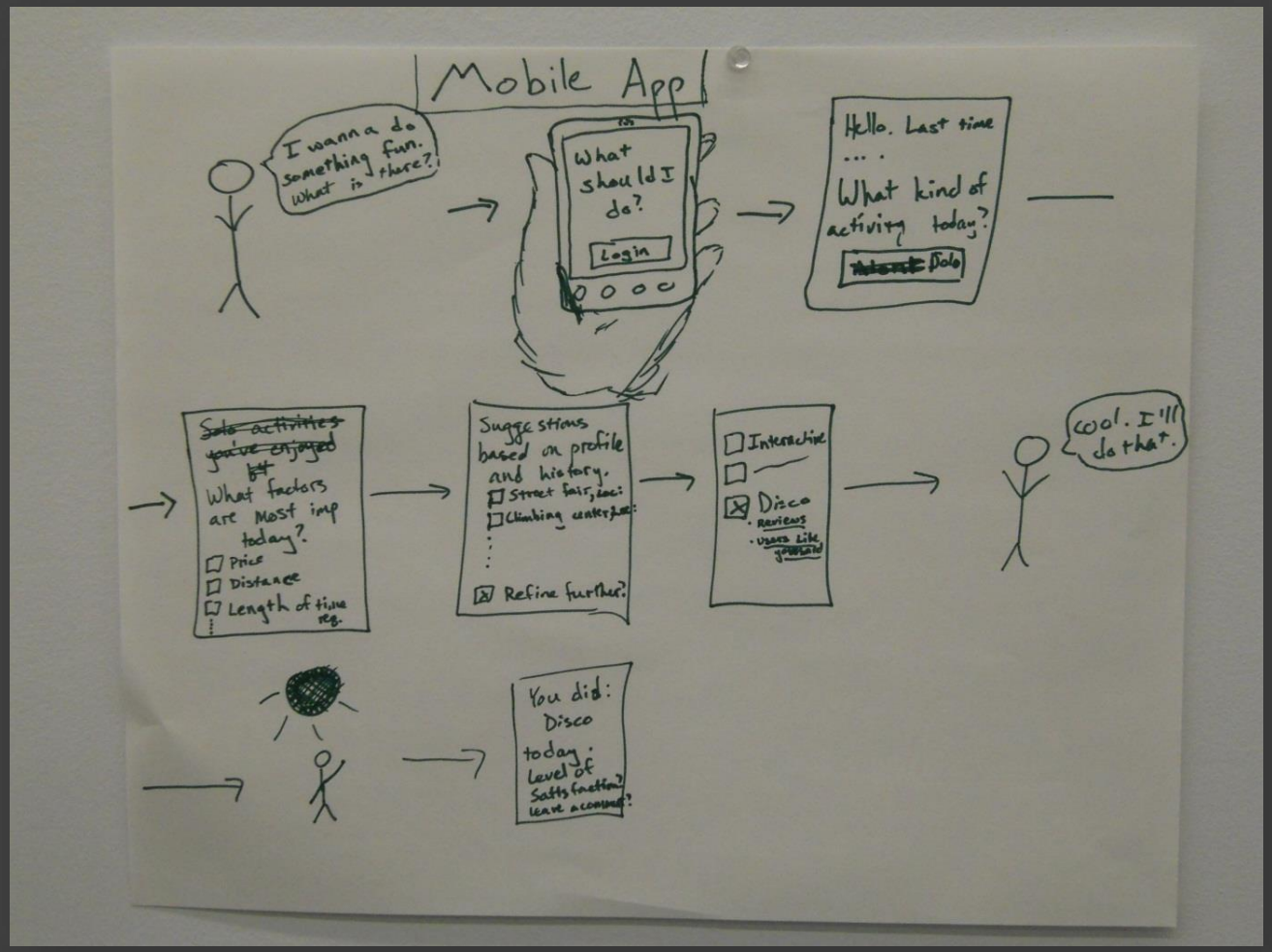
*Attendance compulsory for all group members!

Project description

- Write a ***project description*** answering the following questions
  - Which problem does the app aim to solve?
  - For whom is the solution of this problem relevant?
  - Why is a mobile phone app adequate to solve the problem?
  - Which sensors of the mobile phone will be used?
  - Which additional information is needed?
  - Is the active collaboration of several users required?
  - Does the app collect or store data that raises ethical issues?
  - Which challenges must be overcome to implement the app?
  - …
- Template for project description available in iCorsi

Storyboard

- "Scratch" what the app does and how the users will use it



The idea behind the Mobile App is the fact that people often run into the problem of deciding what to do while already in the city. It could be a group of friends having trouble deciding what to do, or a single person who doesn't know what is being offered nearby. The mobile app would allow someone to pull out their phone, login to the service, and use already personalized information to help come to a decision about what stores nearby they would be interested in. This idea has the most room for expansion, since it is such a modular idea, and it is also the one which provides the user over the most control over the interaction with the service. The main thing about the Mobile App would be the fact that people could always change their motivations and interests on the fly, providing themselves with new and exciting options for places to see and experience.

Image source: http://hfid.olin.edu/sa2012/s_engr3220-chronos/NeedsAnalysis/design_storyboards.html

How to storyboard?

- For additional hints see slides in iCorsi
  - P01: Supplemental file - How To Storyboard

APP presentations

- Two presentations
  - Presentation of project idea
- Project idea (during office hours)
  - 5 minutes presentation
  - 15 minutes discussion
- Final presentation (in class)
  - 4 minutes presentation (DO NOT OVERRUN!)
  - 3 minutes discussion
  - 1 minute “handover”

Assumption: max 10 groups! Changes may be needed depending on actual number of groups.

Presentation of project idea

- Maximum number of slides: 5
  - Title slide (1)
    - Name of app and of group members
  - Motivation slide (1)
    - What is the problem your app is supposed to solve?
    - Why do you expect it to be useful?
    - What's wrong with existing solutions (if applicable)
  - Project slides (2)
    - Describe how you plan to implemented your app
  - Storyboard slide
    - Add the storyboard of your app
  - Thank you slide
    - "Free extra" slide to summarize your talk and thank the audience
    - Be creative! ☺

Final presentation

- 4 minutes presentation (DO NOT OVERRUN!)
  - 3 minutes discussion
  - 1 minute “handover”

Assumption: max 10 groups!

- Maximum number of slides: 6

Title (1 slide)
  - Name of app and of group members

Motivation (1 slide)
  - What is the problem your app is supposed to solve?
  - Why do you expect it to be useful?
  - What’s wrong with existing solutions (if applicable)

Project design and implementation (1 to 3 slides)
  - Describe how you designed and implemented your app
  - We recommend adding also the final storyboard of the app

Thank you (1 slide)
  - “Free extra” slide to summarize your talk and thank the audience
  - Be creative here ☺

Presentation: Alternative formats

- Record a video
- Use Pecha Kucha style
- Prepare a play

- Conceptually, you should structure the video in the same way slide-based presentations are

APP’s implementation

- Software: Android
- Hardware: Any Android phone

- Resources
  - Lecture and tutorial slides
  - Official Android documentation
  - Other books, blogs, stackoverflow, …

- Further help
  - Use the iCorsi forum
  - Contact the TAs

Final project report

- The final project report must evaluate the outcome of the project
  - Is the problem solved?
  - If not, why?
  - How do you measure “how good” your app is?
  - Which unexpected problems arose during the implementation?
  - …
- A template for preparing the final project report will be provided in iCorsi

Grading of the APP project

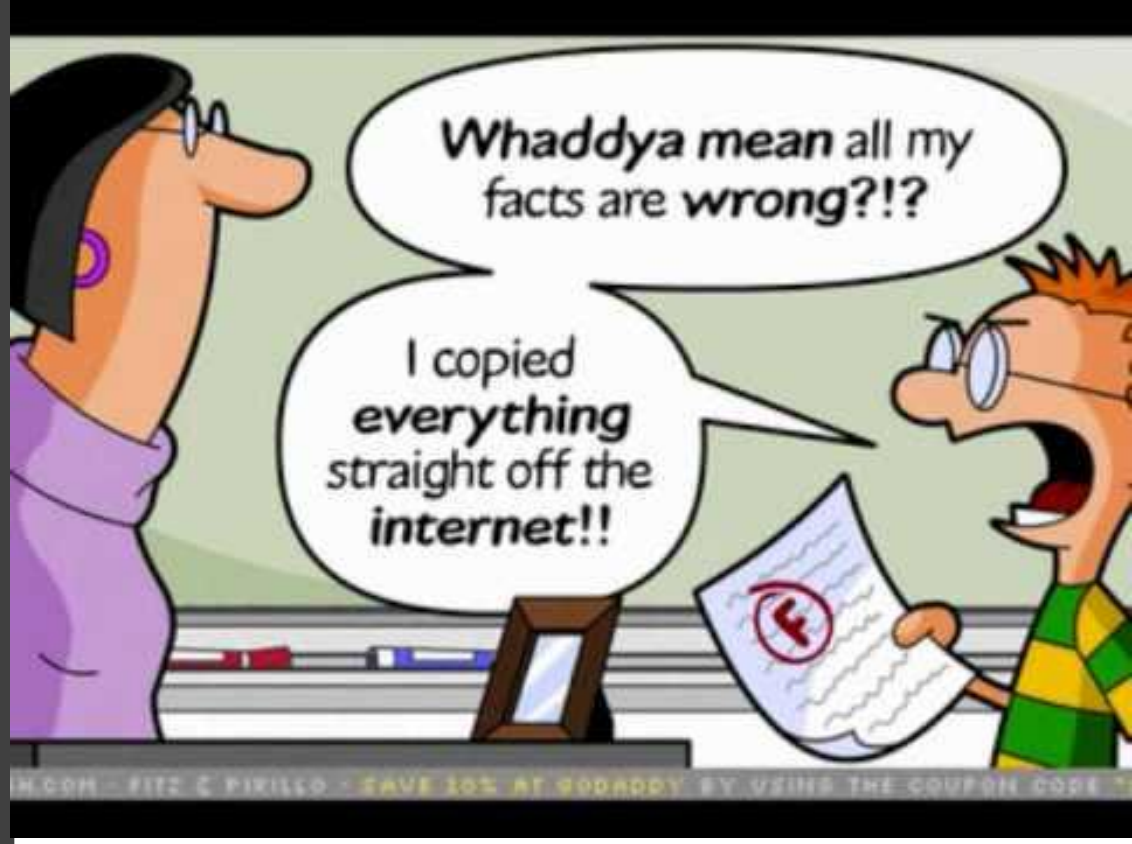
- Grading of the project
  - 15%: Project idea (difficulty level, originality, feasibility, discussion during office hours…)
  - 15%: Mid-term project reviews (quality of presentation and discussion)
  - 40%: Code (code quality, functionality, documentation)
  - 15%: Final report
  - 15%: Final presentation

- Grades are given to individual students
  - For the project, every student must clearly indicate who has taken responsibility for which part of the APP

A note on plagiarism

- Cite all sources used to implement your app
  - Other apps
  - Generated code
  - Code examples found online
  - External libraries
  - Etc.

- Where to cite?
  - In the code documentation
  - E.g., in the documentation comments of a class or method or before a specific instruction block



In the final project report, you will also be required to cite your sources!

Image source: https://i.ytimg.com/vi/BbAoJyrMqYI/hqdefault.jpg

Your questions

Q: Can we use existing libraries/code for our class project?

A: Yes, you can (and should). You must however cite all sources used as well as specify your original contribution (both in the code documentation and in the final report)

Your questions

Q: Is starting from the StepApp compulsory? Or we could write a new app from scratch?

A: No, you can also write a new app from scratch, if your project idea requires that.

Your questions

Q: Can we also write the app in Kotlin (instead of Java)?

A: We recommend writing the app using Java. You are allowed to write the app in Kotlin, but the TAs won't be able to provide support for the implementation.

Have fun with your APP!

Image source: http://sebastianlierka.de/wp-content/uploads/2011/07/androids.gif