Final Project
Android mobile application for sensing and/or control

For the course project, you are going to put into practice all that you learned in this course by developing a native android app that takes advantage of sensing and control capabilities that modern smartphones offer. You will develop an Android App in **Kotlin** that integrates sensing functionalities. You do not need to come up with a groundbreaking project idea (hopefully you can prove me wrong!), but it should be functional, well-designed, and interesting for you to develop. Try to think about a project in which you are really interested in.

Best project award
You will use an App that we will provide to evaluate the rest of the projects during the presentations that will be held the last week of the quarter. The winning team or individual will receive a course best project award. Due to remote logistics, the prize has not been decided yet. Further information will be provided during the quarter.

You are required to develop one Android Application in Kotlin.
Option A: Use an Android Smartphone only.
Option B: Use an Android Smartphone and an Arduino board.

Deadlines (please use Canvas and your Github repos for all the submissions)
• Project proposals and team registration: 11:59pm on Sunday, July 11th.   • Project update: 11:59pm on Sunday, August 1st.   • Project presentation and demonstration: Thursday, **August 19th at 6:00pm**.   • Final project report and source code: 11:59pm on **Friday, August 20th**.

Instructions
- Use Kotlin to program your Android app. ~10% of the source code can be programmed in Java (you can have Kotlin classes and Java classes within the same app, but do not mix Java and Kotlin code within the same class).
- You can work individually, or in teams of 2 or 3 people.
- Your app should use at least one sensor from the smartphone, and/or from the Arduino board (camera, motion sensors, temperature sensor, pulse sensor, pressure sensor, ambient light sensor, microphone, NFC, etc.), process and analyze the data, and provide some useful/relevant output as a result.
- If you decide to use Arduino: you can use the Circuit Playground board that we distributed in class, or other board of your own choice. You can use any additional external shield or component. In summary, you can use any hardware that you consider relevant.

Project proposal – due by 11:59pm on Sunday, August 1st
Please submit one-page long project proposal. Your proposal should contain the following:
- Brief description of your planned project.
- Brief summary of main functionality of your project.
- Some initial user interface design (handwritten design is fine!).
- What sensor(s) do you plan to use for your project use.
- What hardware components will you use for your project, besides the android smartphone, if any.
- If you are working in a team, who are your teammates?

Note: your submitted final project does not need to follow strictly what you submit in this proposal, but it should not be a completely different project. The goal of this project proposal is to have a draft project idea to help you get start working on the project.

Project update – due by 11:59pm on Sunday, July 11th

Please submit one-page long project update. In your update, you should include the following:

1. Done steps: please report how far have you come with your project.
2. Challenges and obstacles: please report if you have encountered any challenges in your project.
3. Harder steps/hurdles: please report if you expect any hurdles finishing the project. You also want to comment on ways you might try to mitigate those issues.

Class Presentation – slides due by 6:00pm on Thursday, **August 19th**
Prepare a 10-minute-long presentation, introducing and showcasing your project, and submit your presentation slides on Canvas. Pdf or PowerPoint formats are preferred, but other formats are fine too.

To present, you will share your screen on Zoom. For privacy, class presentations will NOT be recorded. If anyone has any inconvenience with sharing the screen with the presentation, presenting, and/or showing a live demo please email me (Tamara).

Final Demo
At the end of the presentation in Zoom, you will show a short **live demo** of your project. The live demo is mandatory.

Final Report and Source Code – due by 11:59pm on **Friday, August 20th**.
Submit a short report, where you present your project. If you work in a team, please submit only one report per team. Include the structure of your app, what sensor(s) do you use and how you manage the data, and the main functionalities of your app. Include any additional information that you consider relevant.

This report should be brief and concise. Please limit it to 4 pages, and submit it on Canvas. Please also push your source code to your private repo.

Grading (0-45 points)
- <u>Project proposal</u> **(10 points)**
- <u>Project update</u> **(15 points)**

- <u>Final presentation and demonstration</u>: on a scale of **35 points**, based on the following
  - Presentation covered the required scope within the allowed time period.
  - Clarity in the presentation (relevant content).
  - Final demo execution.
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- <u>Final report</u>: on a scale of **15 points**, based on the following:
  - Overall readability.
  - Clarity in the exposition of the app functionality.

- <u>Project technical execution</u>: on a scale of **25 points**, based on the following
  - App builds and runs without errors.
  - Use of different sensors and correct processing the sensor data.
  - Use of Arduino will be valued positively but is not required to get full credit.
  - User-friendly Graphical User Interface, intuitive for the user, and well structured.
  - Overall functionality of the app.