Final Assignment Paper

Introduction to Project

As students of ITU one of the main difficulties is finding room to work on exercises and assignments. Currently the only way of finding an available room is physically going around the school or asking at the front desk. We would like to create a live updating app, that makes it possible for the student to sort through rooms and show the booked-status of the room.

Another issue is the general wayfinding of the school. Currently there are not a lot of signs actually showing where the rooms are located on each floor. We therefore also wanted to implement a map, that guides the student to a specific room.

A lot of students also use public transportation, and especially the metro, to get to and from school everyday. We therefore also wanted to make the app even more useful, by having a constantly updating overview of the departures from the two stations closest to the school.

Requirements / Concepts

We worked with the following concepts, that were introduced during the semester:

MutableLiveData

The list of rooms are updated via MutableLiveData. This can be seen in the `HomeViewModel` file.

An Internal SQLite database

To maintain, create and sort the list of rooms, we worked with the Room library implementation, which simplifies working with SQLite databases. To achieve this, we worked with the two different class types; Entity (Create the tables) and DAO (SQL-queries). They can be found in the `data` folder

Constraint Layout

We used constraint layout in the `frame_departure_board.xml` file.

Networking

We worked with both Rejseplanen and Google Maps API to constantly update the information being shown in the app.

Features

The app consists of three main functions, which also are divided into three menus in the app. We will now explain each.

Home

The main functionality, and the core idea of the app can be found here. Here the user is able to look at a list of all the rooms in the ITU-building. They are then able to sort the list by four categories: All, Classroom, Skybox and Auditorium. The user is then able to toggle on or off an option to show current available rooms (Rooms not having an event / booking).

Departures

We implemented Rejseplanens API, which automatically updates all departures of busses, trains and metros across Denmark. As mentioned, we wanted to track the two metro stations; DR-Byen and Islands Brygge, and show the next departures from those two stations. The user is able to also manually update this, by using drag-up updating.

Map

To further expand on the room-overview of the school we implemented Google Maps API. When the user visits the “Map”-part of the app, they are shown a map of the school, and are able to zoom in and show exact locations of rooms. Furthermore they are able to search for rooms using the search-bar at the top.

Short-comings

Use of API

As mentioned, our first thought was to use the API of ITU’s room booking system, to automatically update the events and bookings created by students and

teachers. We therefore contacted the Facilities Management of ITU about this information. Unfortunately they told us, that this information is run by a third party company, and this would be difficult to share. We spoke with our teacher (Emre Dogan), and he suggested that we could use an offline JSON file, with some fictional events to simulate the functionality. We went with this solution. The JSON file can be found under `Assets`.

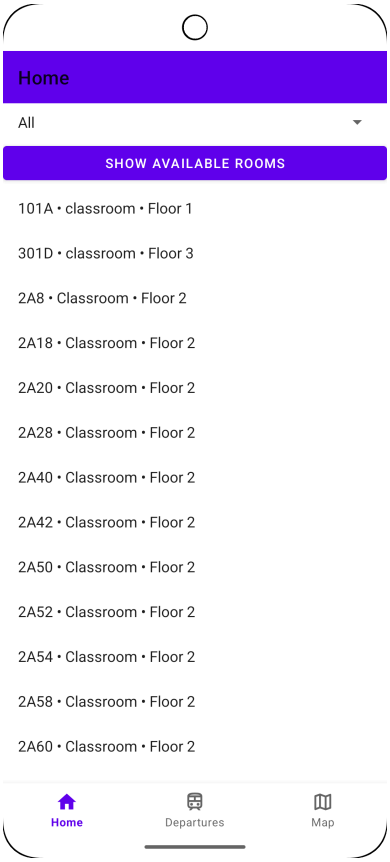
We still wanted to work with an updating API, so that is why we implemented the data from Rejseplanen.

More user-friendly wayfinding

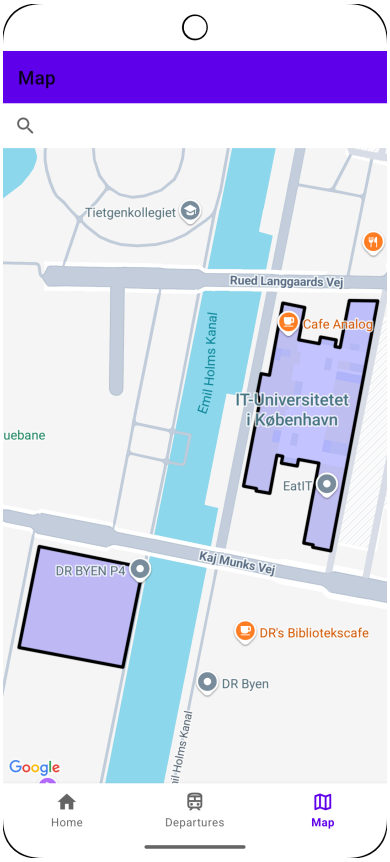
As we worked towards the final product, we came up with the idea, to make the list of rooms clickable, and automatically open up the Maps view and show the exact room on the map. Unfortunately, due to time-shortage, this was not possible. Instead we implemented a search-function in the Map-section, which makes it possible for the user to search for a specific room and have it shown on the map.

Screenshots

We tested the app on “Pixel 8 Pro”


Home
All
SHOW AVAILABLE ROOMS
101A • classroom • Floor 1
301D • classroom • Floor 3
2A8 • Classroom • Floor 2
2A18 • Classroom • Floor 2
2A20 • Classroom • Floor 2
2A28 • Classroom • Floor 2
2A40 • Classroom • Floor 2
2A42 • Classroom • Floor 2
2A50 • Classroom • Floor 2
2A52 • Classroom • Floor 2
2A54 • Classroom • Floor 2
2A58 • Classroom • Floor 2
2A60 • Classroom • Floor 2
Home
Departures
Map


Departures
DR Byen
Time Track Direction
10:34 2 Vanløse
10:35 1 Vestamager
10:37 - Vestamager Nøragersmindevej
10:39 - Rådhuspladsen
10:39 2 Vanløse
10:40 1 Vestamager
10:41 - DR Byen St.
10:43 2 Vanløse
10:44 1 Vestamager
10:45 - Femøren St.
Islands Brygge
Time Track Direction
10:34 2 Vanløse
10:35 1 Vestamager
10:37 - Vestamager Nøragersmindevej
10:39 - Rådhuspladsen
10:39 2 Vanløse
10:40 1 Vestamager
10:41 - DR Byen St.
10:43 2 Vanløse
10:44 1 Vestamager
10:45 - Femøren St.
Home
Departures
Map


Map
Tietgenkollegiet
Rued Langgaards Vej
Cafe Analog
Emil Holms Kanal
IT-Universitetet i København
EatIT
Kaj Munks Vej
DR BYEN P4
DR's Bibliotekscafe
DR Byen
Google
Home
Departures
Map