MONASH University

FIT5046 (Mobile and Distributed Computing Systems)

Assignment 2 – Android Project Proposal (20%)

Due Friday 11:55pm, 21st of April (Week 7)

The assignment is **a group assignment** with **a total mark of 20**.

Each group can have 3 to 4 members. All group members should be from the same lab.

This assignment requires submitting:

1. **A project proposal using the template provided in Appendix A**
    - The word limit of the proposal is **1500 words**.
2. **A task allocation (Appendix B)**.

The purpose of this assignment is to propose the design specifications of a mobile distributed application for an Android app that you will develop and implement as a group (using Java or Kotlin) in Assignment 3.

Assignment 3 (Android App Development) is based on this proposal, so **the group members should stay the same for Assignment 2 and Assignment 3.**

This assessment supports unit learning outcomes 1 and 2:

- LO1: identify and describe different approaches and methods for building distributed and mobile computing systems;
- LO2: evaluate several models and approaches and select suitable mobile computing solution to a particular case;

Overview:

You will propose a mobile distributed application with an Android app as its front-end. You will interact with online public web APIs like a weather API or YouTube API, and cloud-based services such as Google Firebase for storage (as the backend).

In Assignment 3, you will build this app in Android according to your proposal. This assignment is an opportunity to use creative and technical skills to create an innovative mobile app that could benefit the society or solve real-world problems.

Please note you need to make sure that you can successfully deliver (implement and demonstrate successfully) all the key features that you propose in this assignment.

Section 1 - Key steps (following the template in Appendix A)

Step 1. As a group, you will first decide on the **application domain** (health, fitness, entertainment, education, smart energy, smart parking or smart gardening to name a few) and **its use and purpose**. You need to also describe the **user group**, and discuss **the scope and limitations**.

Step 2. You need to conduct a **brief market and competitor analysis of similar apps** in the market (Google Play Store or App Store), find and **review two apps** of the same type and understand their key functionalities, strengths, and weaknesses. You should provide FIVE screenshots of the main screens of each of these two apps, and describe any **features/functionalities that differentiate your proposed app** from existing apps. It is fine for your app to serve the same purpose as existing apps but it must be different from existing offerings in some way.

~~**Step 3.** You will **list all key functionalities** of your proposed Android app in a table.~~
This task has been added to the Step 3 (highlighted in blue).

Step 3. You need to **draw a diagram** that shows the main components of the proposed mobile distributed application (explained in the template with an example). Provide a list the server side and client-side components, and how they work together.

Step 4. You need to provide an overview of your UI design for the **main screens** (Section 2 ~~Part 1~~) and the **navigation hierarchy** of your app **using prototyping tools** with a FREE trial (e.g. Lucid Charts, InVision, FIGMA, Wondershare Mockitt (previously known as Mockingbots)). This overview is explained in the template with an example.

Step 5. You will assign the tasks among the group members and **complete the Task Allocation** form (**Appendix B**).

Step 6. Your proposed Android app **must include** the **key screens and components** defined in **Section 2 as the minimum requirements.**

Step 7. You need to consider **the requirements for each achievement level** described in **Section 3.**

Section 2 – Key requirements

Your proposed app must include the following screens and Android components as the **minimum requirements (PASS level).**

Key screens	Android Key components
• **Login screen** with the option of Sign-up that will lead to the Signup Screen, • **Home Screen** (dashboard) • **Data Entry screen** - this could be the sign-up screen if you get all the user details OR you can have two separate screens (the sign-up screen to get the email and password and the user data entry screen to get user details such as name and address) • **Map screen** (using any FREE map API). The user address will be used to show the user location on the map. This might require converting the address to the latitude and longitude values. • **Reports (graphs) screen** showing a bar or pie chart	• **Fragments** • **Navigation Drawer** • **Room and LiveData** (including all Room components and repository) • **Retrofit** for interacting with public web APIs (other than Google Search)

Section 3 – Achievement Levels

Credit level

To achieve a Credit level, the mobile app must successfully implement TWO additional features:

- **Firebase Authentication** for Login and Signup
- **Android RecyclerView with CardView** that displays data from the **Room** database **(using LiveData)**

Distinction level

To achieve a Distinction level, the mobile app must implement TWO additional features.

- **Firebase Database** to store the user's profile/data
- **WorkManager** to run a job in the background continuously e.g. every night to store the local data in the Firebase database (https://developer.android.com/topic/libraries/architecture/workmanager)

High Distinction level

To achieve a High Distinction level, the mobile app must implement **ONLY ONE of the following** additional, **advanced features**.

- Integrating the android app with **Facebook SDK** and sending a message/data from the app to your Facebook account
- Incorporating **Google calendar** and using the user's calendar events to perform context-aware and personalised tasks
- Using **sensors** in the app that is meaningful and related to your app but it must be implemented and demonstrated with the emulator
    - Sensors (https://developer.android.com/guide/topics/sensors)

      https://developer.android.com/guide/topics/sensors/sensors_overview#test-with-the-android-emulator
- Other advanced features (you MUST discuss it with your tutor and get their approval)

Appendix A

The project proposal template

The proposal must have all the following headings:

1 Introduction

1.1. An Overview of the proposed android app

//here briefly discuss the application domain and main use/purpose

1.2. User group

1.3. Key functionalities

1.4. Scope and limitations

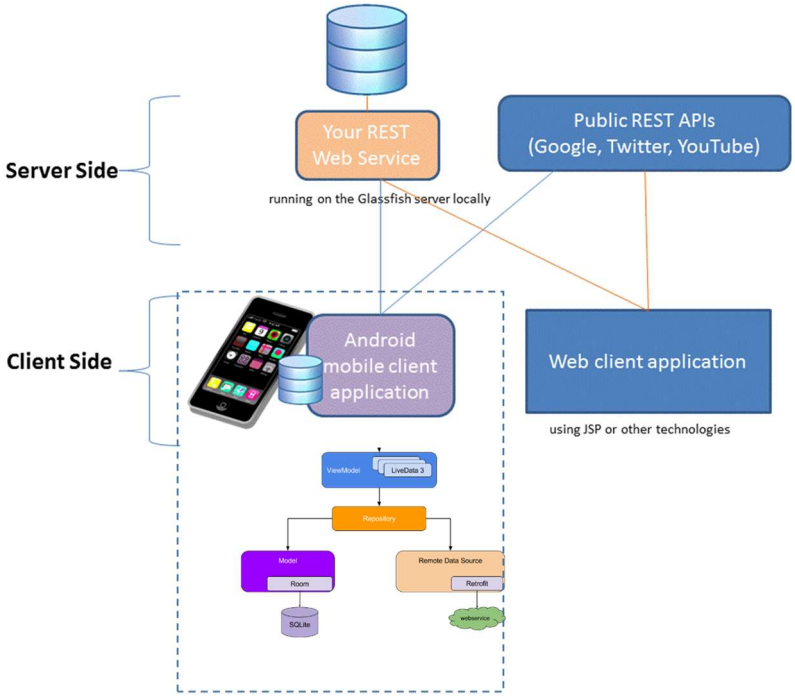
2 The market and competitor analysis

//a brief description of two (the most popular and well-known) apps and how your app will be different and novel compared to these two apps, include a few screenshots of these two apps

3 The system architecture

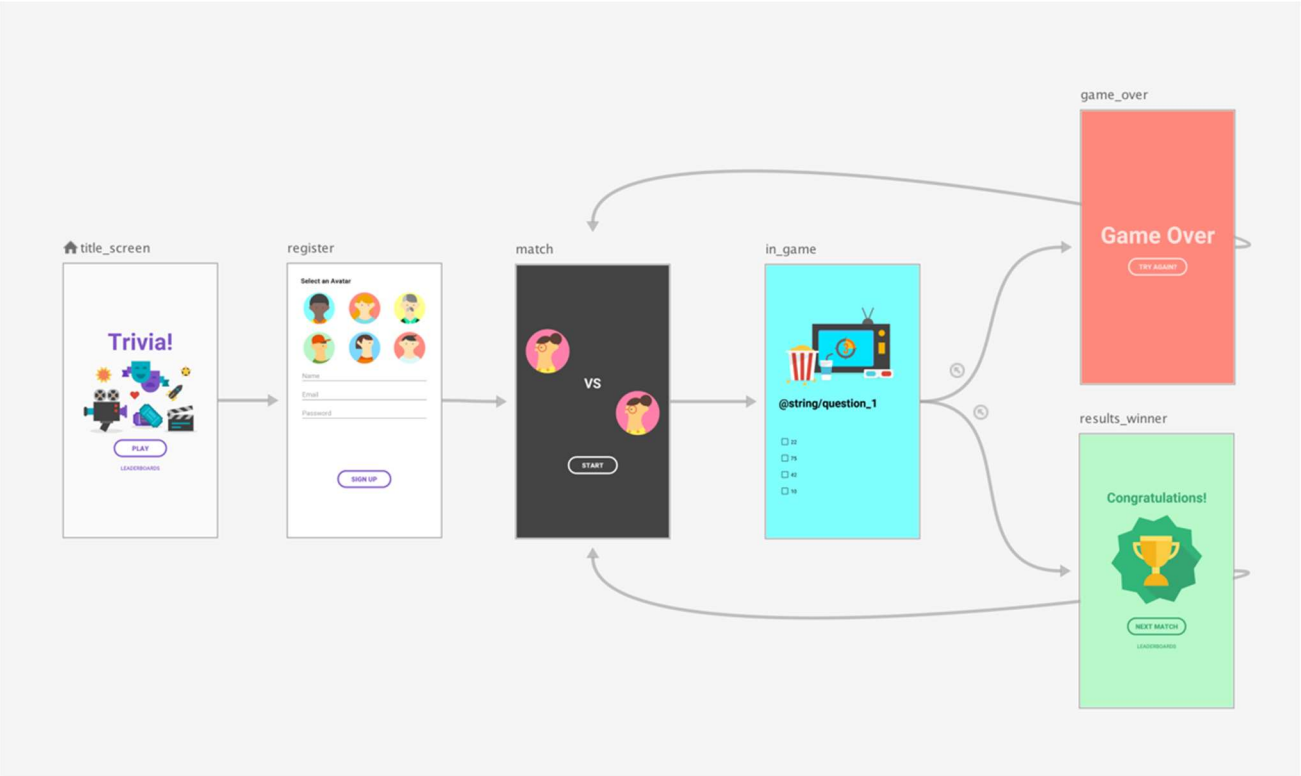
In this section, you will provide a system architecture diagram of your proposed app that shows the front-side and server-side components, plus all the key Android components mentioned in Section 2 ~~Part 2~~ (refer to the example below). You also need to provide a short paragraph about these components and how they work together.

This diagram is only an example. You must show the name of APIs you will use, the server-side database (e.g. Firebase). You also must show what Android components you will include in another box. If you are using any other components, show it in the diagram.



4 The UI Design and Screen Mockups

In this section, you need to provide screen mockups created by any prototyping tool and the navigation flow between them (using arrows). You need to provide a meaningful title for each screen. The figure below is just a guide.



Source https://developer.android.com/guide/navigation/navigation-design-graph

5 Advanced features

//additional components based on Section 3 and how you will achieve them (any SKD details, or online sources and tutorials)

6 References (the publications, and website links based on the APA style)

Appendix B

Task Allocation Form

Please provide the name of tasks and the name of the group member(s) who did the task in the table below.

Task Name and Description *You need to briefly describe which proposed components and app screens group members will develop later in Assignment 3*	**Team Members**