Design Proposal

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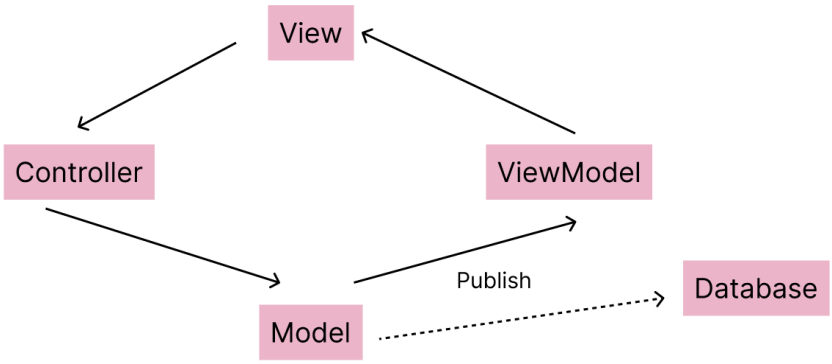
Architecture

1. **Provide a high-level component diagram, showing the structure of your system. This will likely include "black boxes" representing your client application, database, and possibly some middle-tier service**

MVVM Architecture



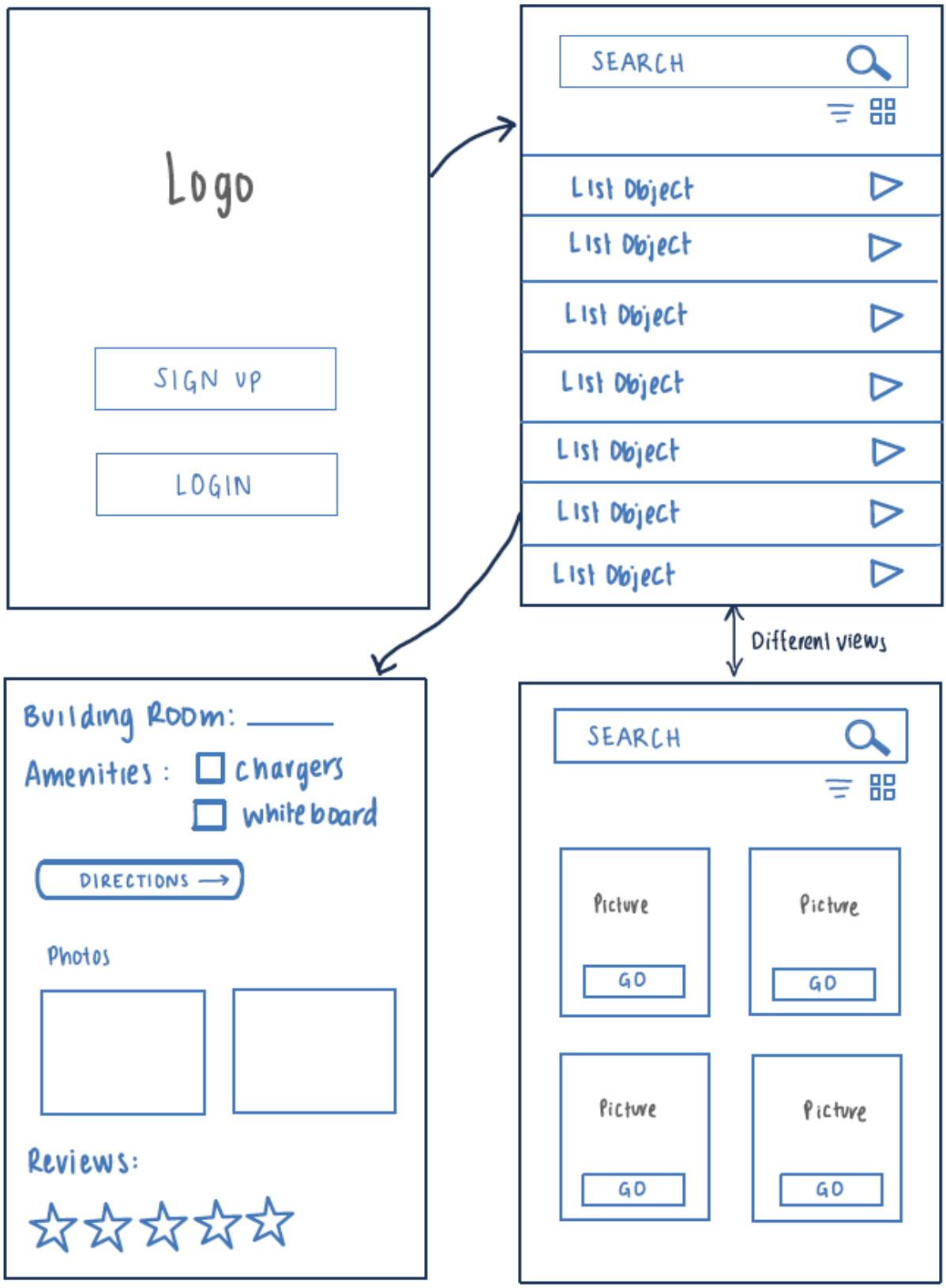
   a. We will also be using Firebase for single sign on: https://firebase.google.com/docs/auth/android/google-signin
   b. Other resources for our own reference:
      i. https://developers.google.com/identity/sign-in/android/legacy-sign-in
      ii. https://developers.google.com/identity/android-credential-manager
      iii. https://developer.android.com/identity/sign-in/credential-manager-siwg

2. **You've been provided with a number of architectural styles. Which one do you think suits your application? (NOTE: this is a trick question. For 90% of you, you will want a layered architecture).**
   a. We will be using the MVVM architecture style, as shown in question 1.
   b. Our data will be stored in Firebase which includes information on each study spot. The model will communicate with this remote database.
   c. The View would be visible to the user where they could search/filter study spots, provide reviews and interact with the application.
   d. The ViewModel will be communicating between our model and view to update and display the most updated information to the user. In our case, this may be displaying the study spots that the user has clicked, which will bring up a different screen.
   e. The controller will send information to the model when a user acts, such as clicking a button to favorite a study spot

3. **For components outside of your local application, where do you expect them to be hosted? Will they be hosted by some third party? e.g, a cloud service like AWS? A cloud database like MongoDB?**
    a. We will be storing our study spots information and user data in Firebase.
4. **Are there privacy and security implications to your design? What concerns do you have with your application being online?**
    a. Yes, we need to implement sign on features to prevent unethical usage of the app. We are planning to integrate the google sign on authentication through Firebase.
    b. User would be persistently logged in until they sign out.
    c. One of the features we plan on incorporating is for the user to add comments on the study spot. A concern is that the comments aren't being moderated.

Application Features

1. **Identify the device and OS version you are targeting with your application i.e., Android, iOS, Windows, macOS.**
    a. Android:
    b. Android version: Pixel 7 Pro
2. **Describe how you will test against these platforms. Note if you have access to this hardware.**
    a. We will test using an emulator.
3. **Are there any features that you do not know how to implement? Identify risks and features that you need to investigate early in your project.**
    a. A feature idea we could implement is allowing the user to add study spots to our database. The risk here is that we don't know how to validate the user's input. We would need an admin validation process that may take some time to implement. This may cause a delay in our progress in finishing the product. As an alternative, we could create a forum for users to send their study spots to us. Then, we would verify the study spot and add it to our application
    b. Another feature idea we could implement is the busyness of each study spot. The risk of this feature is that we do not know how to track real-time updates for each spot. We initially thought of sending notifications to each user every time they reach their desired study spot, however, this would involve constant signal retrieval from the user, which can be difficult to implement. Another approach we could have is to prompt the user to enter the busyness when they open the app again.
4. **Sketch out low-fidelity prototypes of the screens containing the most common functionality in your application. Keep these simple! You need to illustrate basic information and screen flow; you don't need much detail. You should identify screens, their contents and how the user navigates to and from these screens.**
    a. See page below


Logo
SIGN UP
LOGIN
SEARCH
List Object
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List Object
Different views
Building Room: _____
Amenities :
chargers
whiteboard
DIRECTIONS
Photos
Reviews:
SEARCH
Picture
GO
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GO

Dependencies

Are there any local dependencies or libraries that you are planning to use?

- Dependencies or libraries we plan to use are Firebase for authentication and storing of data.
- Google maps API to help with directions and calculate the distance a user's location is from a certain building.
- Kotlin UI libraries for building our screens and components. http://github.com/appcypher/awesome-kotlin-libraries-for-android?tab=readme-ov-file#ui

Do you need to identify libraries that can handle functionality that you cannot build yourself? e.g., if you are building a markdown editor, you may want to investigate a library to handle parsing and syntax highlighting instead of building it yourself. It is possible, identify these as risks.

A library that will handle functionality that we cannot build ourselves is the Google Maps API. Since we want to provide directions and distance the person is from a certain study spot, Google Maps API will calculate the distance and direct the person there.