Pacman

MentAlly

Android App

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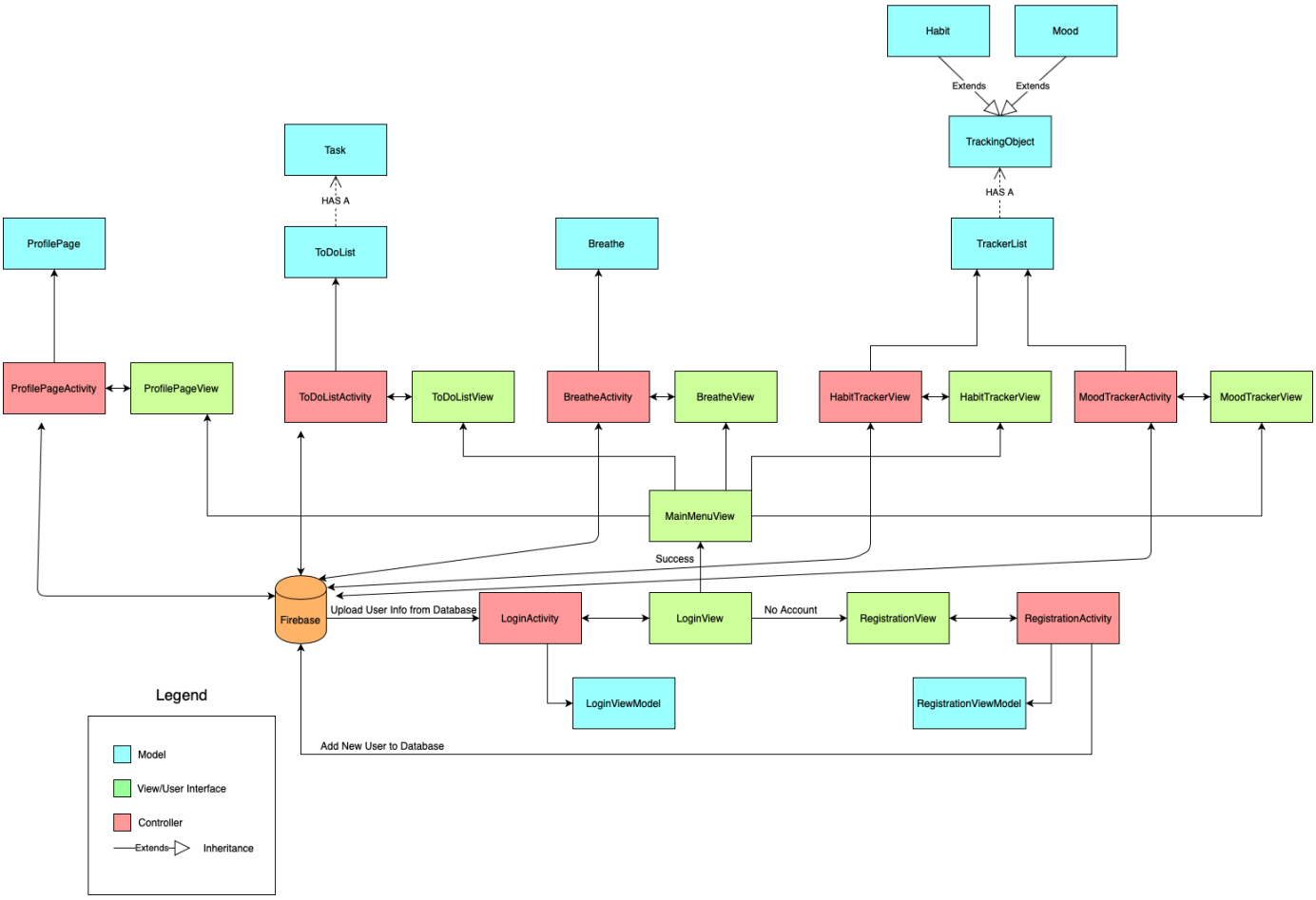
System Design

We will be building an Android app in Java. The app will be built using Android Studio and we use Firebase as the database to store user information. Firebase will be used to add and retrieve user data and authenticate new and returning users. Since the app is created for android users the operating system must be android. Our app requires a connection to the internet as some features of our app will not work without the internet including access to music and logging in via the database. The app is built to work with a minimum of API 28, i.e. Android 9.0 Pie. Support for earlier systems is not guaranteed.

Our app is divided into modules and we will be applying MVC during development. The view will correspond to the user interface. The controller will correspond to Android Activities which collect user data and input from the view and request action or send the information to the model. The model will call required methods then inform the controller of the result. The controller will then decide and make the appropriate changes to the view. Since we have multiple modules that work independently, each module will likely work with its own model, view and controller. The separate views will interact through the controllers which will switch to different views based on user input. The Activities will be responsible for interacting with the database when needed to authenticate user info, update it or delete it. Please see the System Architecture Diagram for a high-level diagram of the architecture.

As we are dealing with a user application, there are many ways that errors may occur in the program. To handle these errors there are various checks put in place. First, all user input must be validated before it is inputted into the database to prevent any issues in the database. Secondly, users must register an account and login to use all app features. Users cannot make multiple accounts with the same email address. These features will ensure that only verified users are able to access information inside the app and it will protect user data. Additionally, errors may occur if the database is down or there is network failure. In these cases, the app should notify users that they must connect to the internet or give them a message that an error has occurred, and users will be notified as soon as the problem is resolved. This will keep users from feeling irritated as they will be informed about the problem.

System Architecture Diagram



CRC Cards

LoginViewModel	
Parent: ViewModel	
• Responsible for validating user input and setting error state in LoginFormState	LoginFormState

RegistrationViewModel	
Parent: ViewModel	
• Responsible for validating user input and setting error state in RegistrationFormState	RegistrationFormState

ProfileActivity	
Parent: AppCompatActivity	
• Responsible for displaying user information • Responsible for allowing user to change their personal information	

LoginActivity	
Parent: AppCompatActivity	
• Responsible for gathering information from view • Use information from view to sign in user • Send information to LoginViewModel to validate input • Reads error/validation state from LoginFormState and makes appropriate changes to user view • Sends user to registration view on request to register	LoginFormState LoginViewModel LoginViewModelFactory RegistrationActivity

RegistrationActivity	
Parent: AppCompatActivity	
• Responsible for gathering information from view • Responsible for registration of user and adding user information to database • Sends user input to RegistrationViewModel for validation • Reads error/validation state from RegistrationFormState and makes appropriate changes to user view	RegistrationFormState RegistrationViewModel RegistrationViewModelFactory

LoginViewModelFactory	
Implements: ViewModelProvider	
• Initializes a new LoginViewModel	

RegistrationViewModelFactory	
Implements: ViewModelProvider	
• Initializes a new RegistrationViewModel	

LoginFormState	
• Responsible for storing the error state of user login input	

RegistrationFormState	
• Responsible for storing the error state of user registration input	