An-Najah National University

Faculty of Engineering & Information Technology

Computer Engineering Department

Graduation Project I

KidSecure

A parental control Mobile Application

Authors

Mahmoud Basha

Tariq Sabri

Under the supervision of

Dr.Anas Toma

Dr.Samir Arandi

Presented in partial fulfillment of the requirements for a Bachelor's degree in (Computer engineering).

Jan 2023

Acknowledgments

“First, we want to express our gratitude to our supervisors Dr. Anas Toma and Dr. Samer Arandi, who didn’t hesitate to provide assistance and instructions for us to complete the project.
Furthermore, we would like to thank all of the professors in the Computer engineering department who assisted us by offering advice.
We’d also want to express our gratitude to our friends and families for their support. We also would like to thank everyone who assisted and encouraged us to work on this project. We would not have been able to finish this project without their help.”

Disclaimer

This report was written by students (Mahmoud Basha and Tariq Sabri) at the Computer Engineering Department, Faculty of Engineering, An-Najah National University. Therefore, it has not been amended or modified as a consequence of the assessment, except for editorial adjustments, and it may include grammatical and content problems. The opinions stated, as well as any conclusions or suggestions, are purely those of the students. An-Najah National University accepts no responsibility or liability for the effects of this report being used for something other than what it was intended for.

Contents

Abstract

In today's digital age, access to new information has never been easier than ever before. And while that is a positive thing in general, the risk of accessing what’s negative on the internet is concerning since it’s all just one click away from any user, including our children.

So we think parents need the aid of keeping track of what their children see on the internet daily. So there is where the idea of KidSecure came into our mind. A parental control application that keeps track of a child’s usage of their mobile device and has some other small features that’ll enhance the user experience.

Now for the tech stack used, we built the main UI using flutter and the endpoints using Node JS alongside ExpressJS with some libraries necessary for validation and security.

Our database choice was MongoDB with a small aid from firebase to implement push notifications.

We also chose Railway, an open-source online hosting service to host our APIs online and not test everything locally.

Chapter 1

Introduction

2.1 Background

The increasing use of technology by children has led to concerns about their online safety. A common concern among parents is the ability to monitor their children's online activity and ensure that they are not being exposed to inappropriate content or interacting with strangers.

2.2 Problem Statement

With today’s technology, it is hard for parents to keep an eye on their children's phones, epically for working parents, nowadays kids will do anything to not get their phones from them, and it is even harder to know what they are using on the phone since they can hide what they are doing or they uninstall the unwanted app reinstall it.

2.3 Significance

Monitoring kids' phones manually would be time-consuming or cause unwanted issues. Our application will do the monitoring process and restrictions remotely from your phone we will provide you with monitoring features for your kid's safety, from anywhere remotely. Installing the App on your child’s device is a must though.

2.4 Objectives and Scope

The application requires to be installed on both devices first, then with some user setup you can start using our application freely, our objectives are to provide families with an easy way to monitor their kids remotely at any time, save time and offer safety

Chapter 2

Constraints and Earlier Coursework

2.1 Constraints Limitations

2.1.1 Time Limit.

It took us a long time to construct the entire program, which included learning technologies, Searching for a topic, creating the policy features, and implementing it for both parent and child.
Time wasn't enough to perform a search for the best libraries to handle some features.

2.2 Earlier Coursework

• Software Engineering:
All of the concepts, including software requirements, architecture, and user acceptability, were thoroughly addressed and proved to be highly helpful in the development of this application

• Critical Thinking Scientific Research:
It took a lot of study across websites to prepare for constructing this application,
Which was practised in this course. On the other hand, it was the first place where
The talent for producing scientific papers was presented.

Chapter 3
Literature Review

Parental control apps are software programs that allow parents to monitor and restrict their children's device usage. These apps can be used to track the websites that children visit, limit the amount of time they spend on their devices, and block certain apps or content.

One study found that parental control apps can be effective in reducing children's screen time, as well as decreasing their exposure to inappropriate content. However, the study also found that these apps can be difficult to navigate and set up and that many parents are not aware of the full range of features that are available to them.

Another study found that parental control apps can be useful for keeping children safe online, but that they may also be used to monitor and control children's behaviour in ways that are not always healthy or appropriate. The study also noted that children may be able to bypass these controls or find ways to access blocked content.

A review of the literature on parental control apps also indicates that there is a need for more research on the long-term effects of these apps on children's digital literacy and autonomy. Additionally, there is a need for more research on how parental control apps impact children's privacy and security.

Overall, the literature suggests that parental control apps can be a valuable tool for parents, but that they should be used with caution and in conjunction with other strategies for promoting healthy device usage and online safety.

Chapter 4

Methodology

4.1 Architecture & Technologies Utilized

The architecture of KidSecure is a monolithic architecture, where all the app's functionalities are integrated into a single codebase. The main technologies utilized in the app include

4.1.1 Flutter

Front-end: Built using Flutter, this is responsible for the app's user interface and user experience. It communicates with the backend to retrieve data and perform actions.

4.1.2 Node js & ExpressJS

Backend: Built using Node.js and Express.js, this is responsible for handling the app's core functionality such as user authentication, data storage, and handling communication with the front end.

4.1.3 MongoDB

Database: Built using MongoDB cloud, this is responsible for storing and managing the app's data. It is used by the backend to retrieve and update data, the database is held on the cloud there is no need for local initialization.

4.1.4 Railway

Cloud-based platform host and run the backend code.

This allows the app to be accessible to users from anywhere with an internet connection, and also allows for easy maintenance and updates to the backend code. By using a cloud-based platform, KidSecure can ensure that the app is always available and performant for its users.

4.1.5 Firebase Cloud Messaging & Messaging

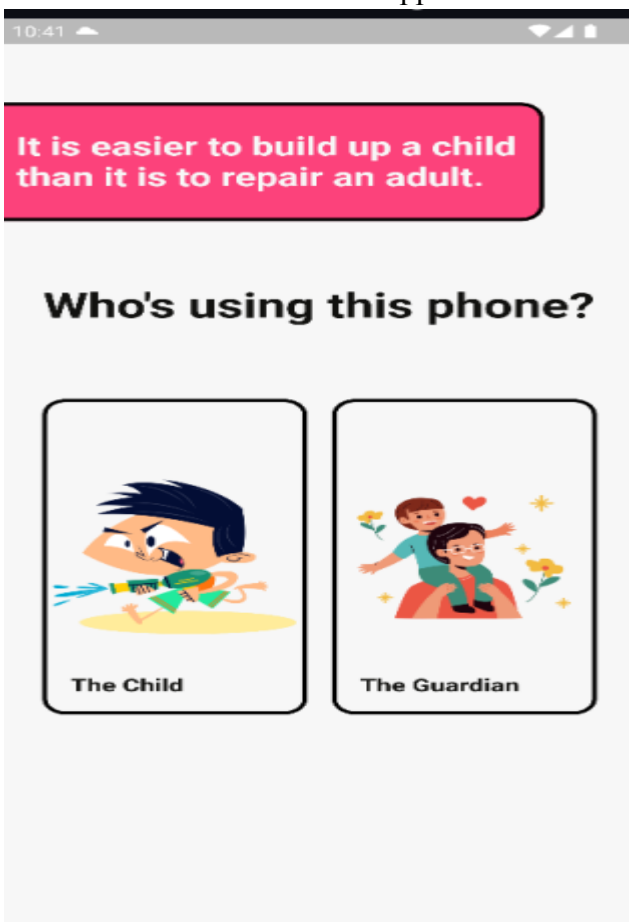
This service is used for sending push notifications to the app. It is integrated with the app to send notifications to users based on certain events or triggers, by creating a token for each device so it can send to specific users.

Others:

-Bycrpt for password hashing.
-Mapbox for geolocation feature, for tracking child location
-cloud firestore for listing tokens and names of devices
-GetX for flutter state management and navigation.

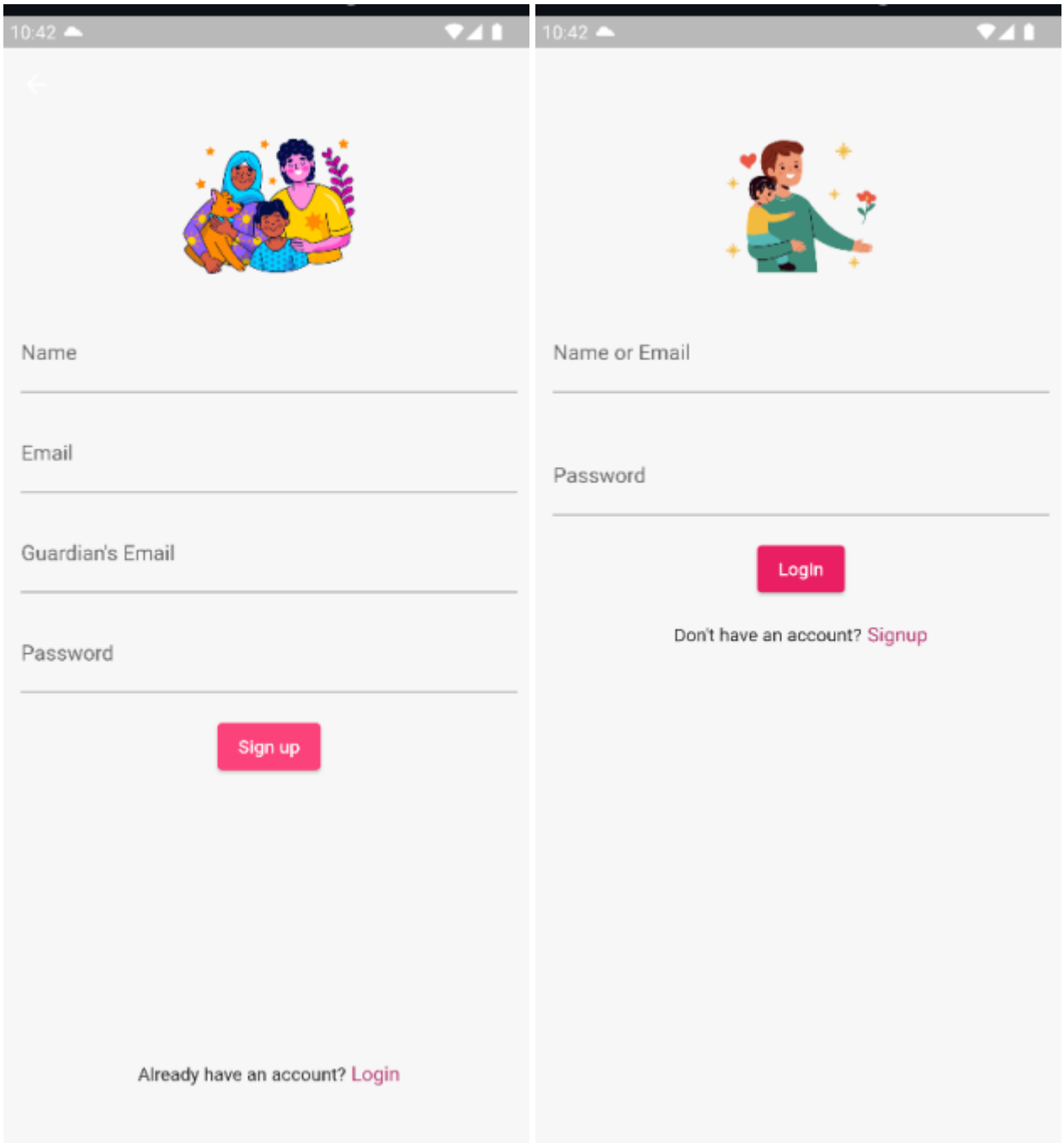
4.2 Features & Implementation

This section will focus on the application features and the implementation



This is the start page where you choose whose device is this.

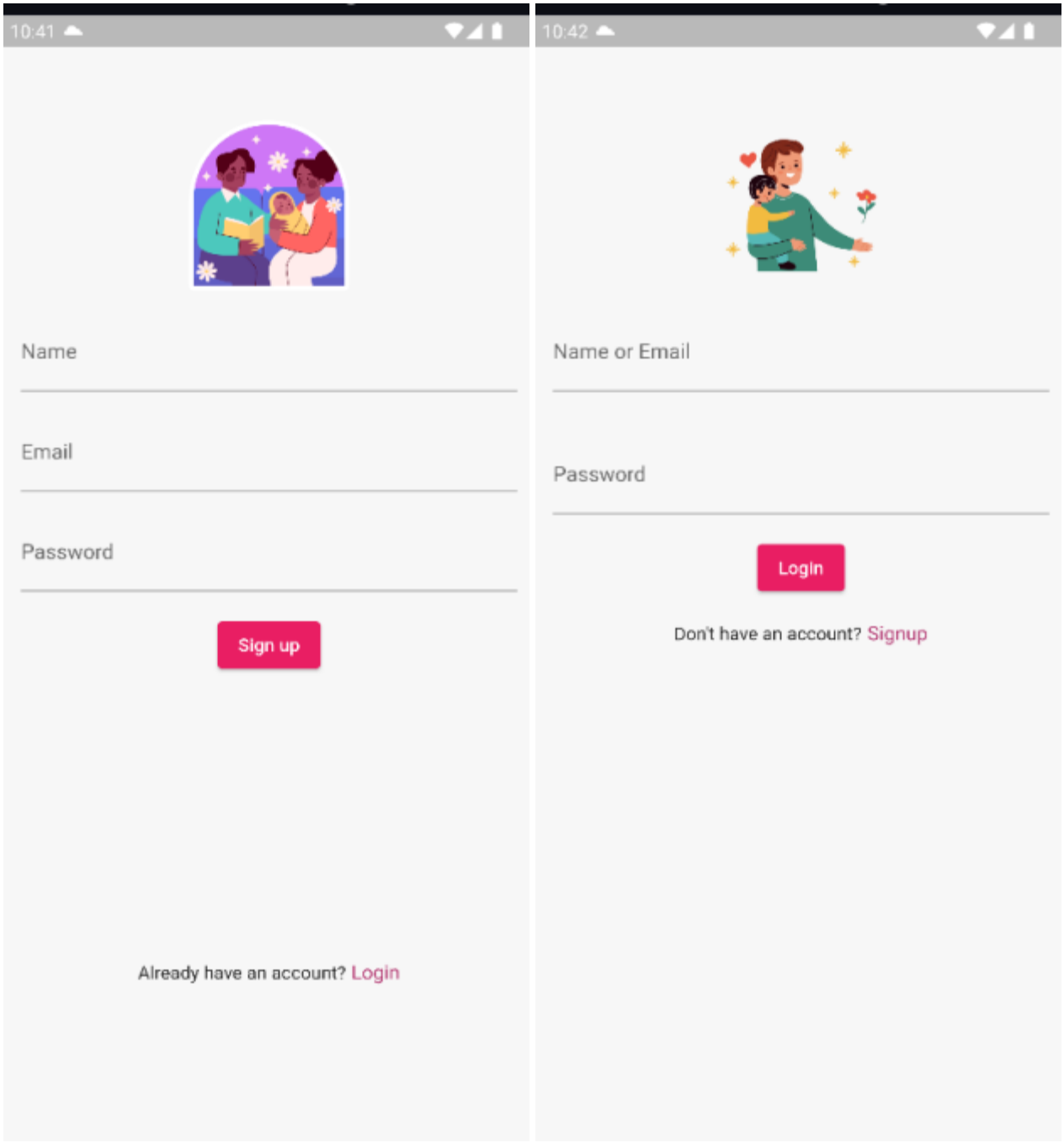
4.2.1 Childs-end



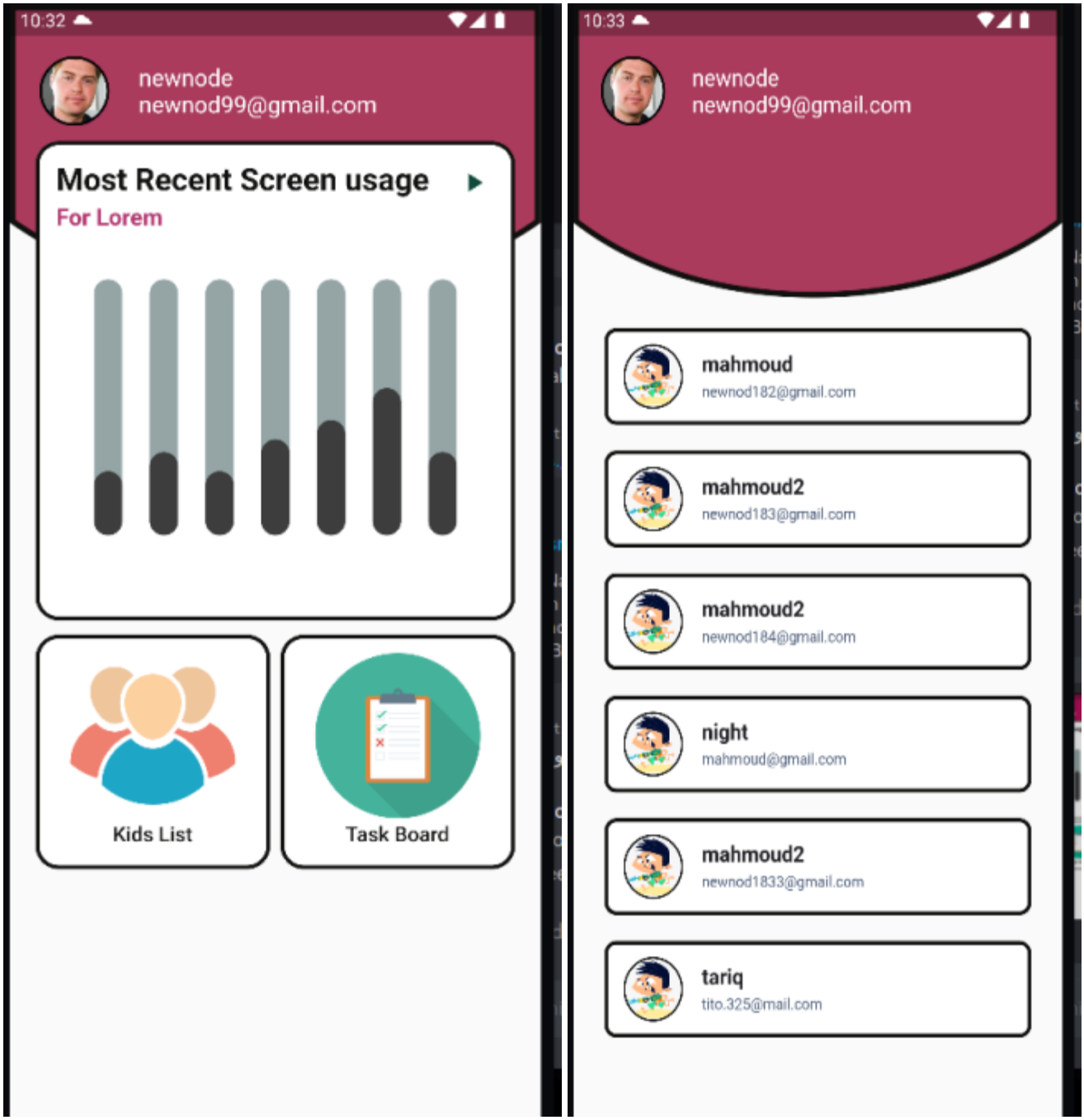
Sing up page where you add a name, email parent email and password.

And login page

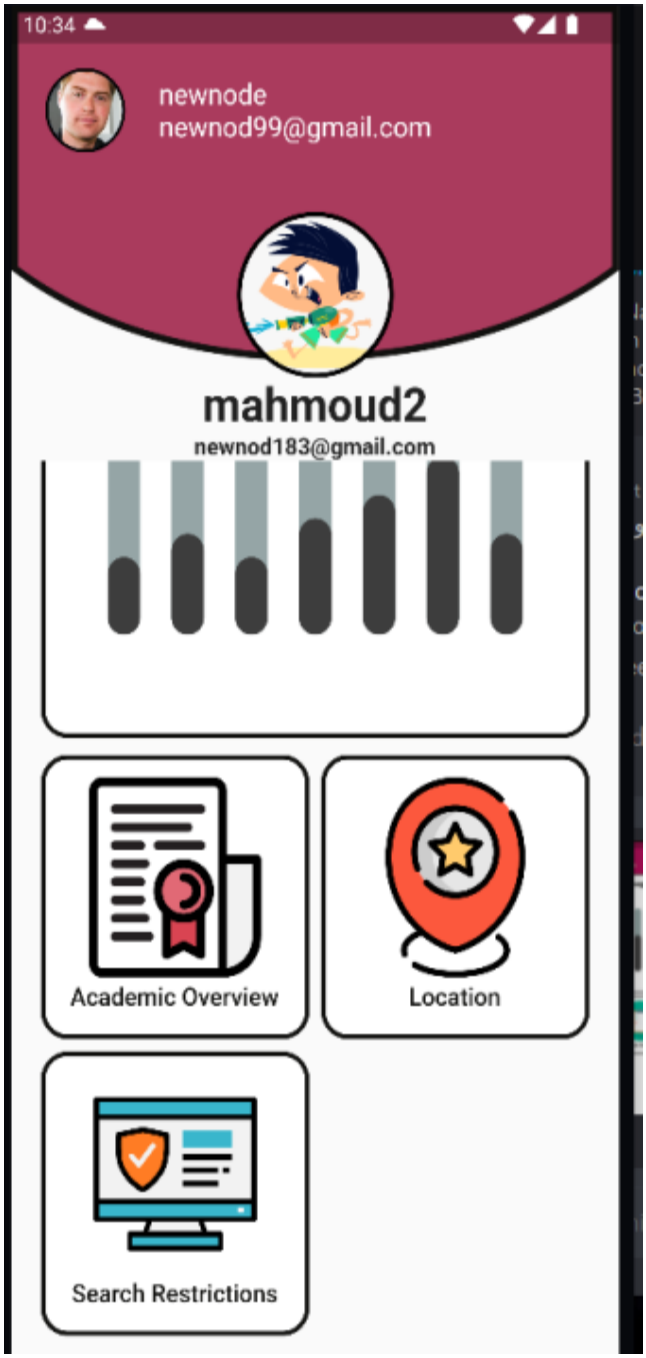
4.2.2 Parents-end

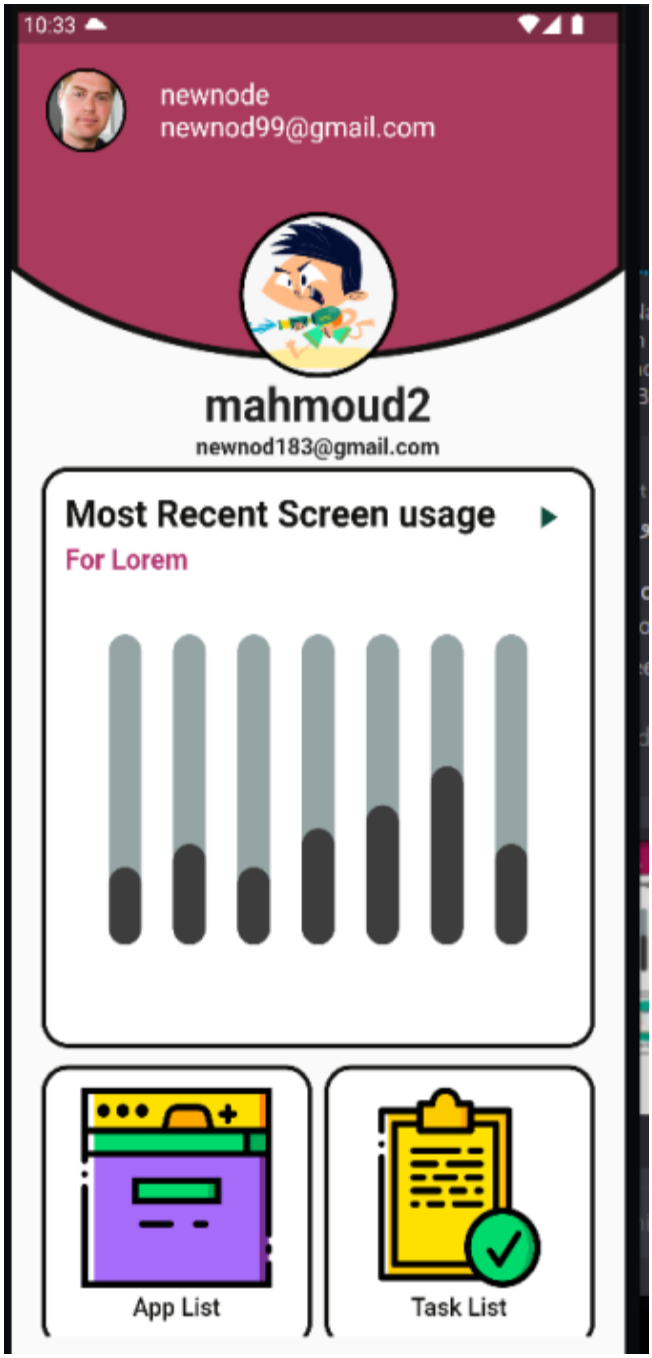


Parent sign up and login pages

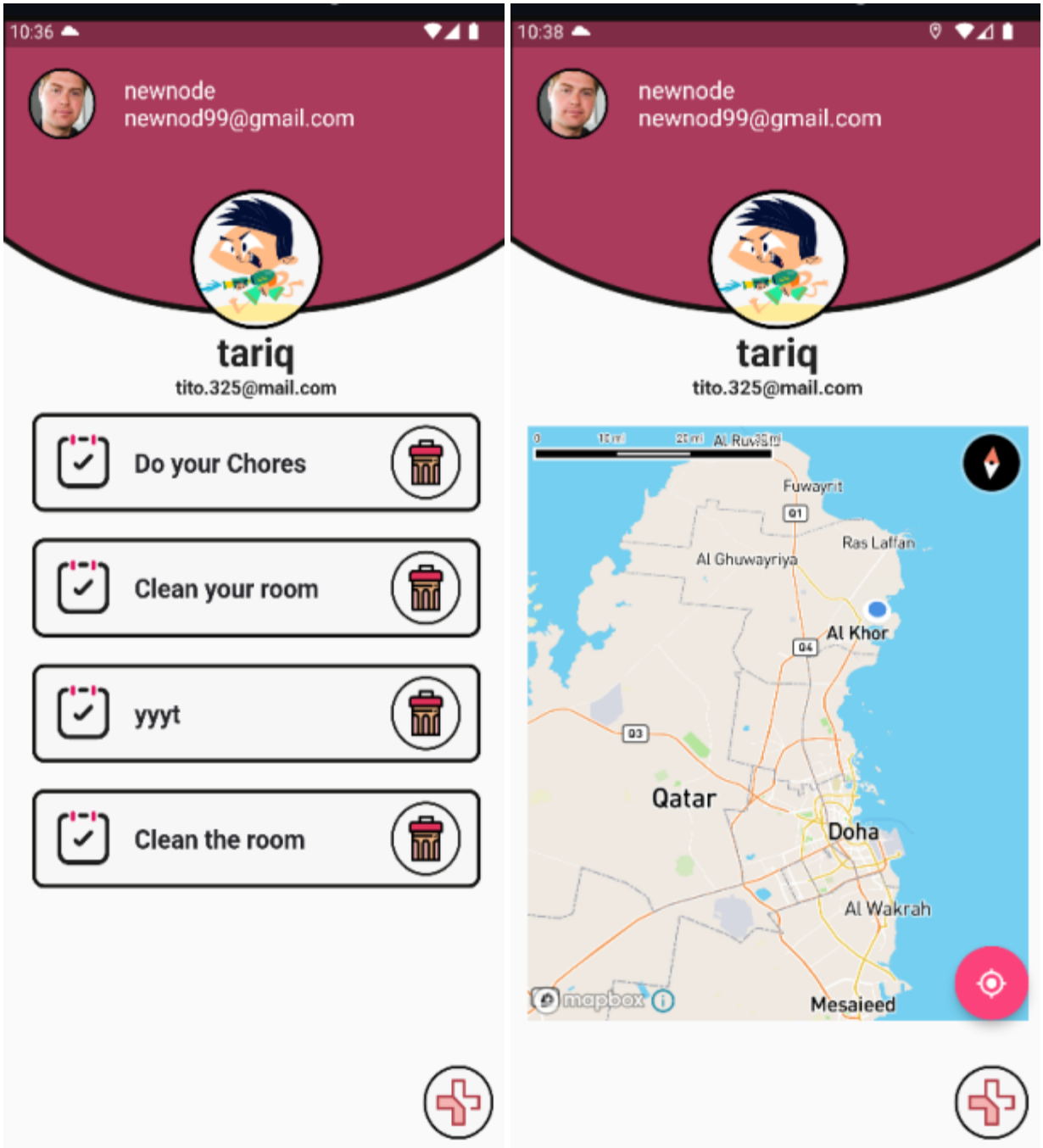


Parent front where he can see usage stats and navigate to kid list or task board.
kid list page where you can see all your kids.





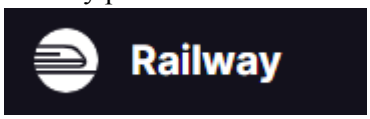
your child page where you can get his data from like location or app usage and list of tasks.



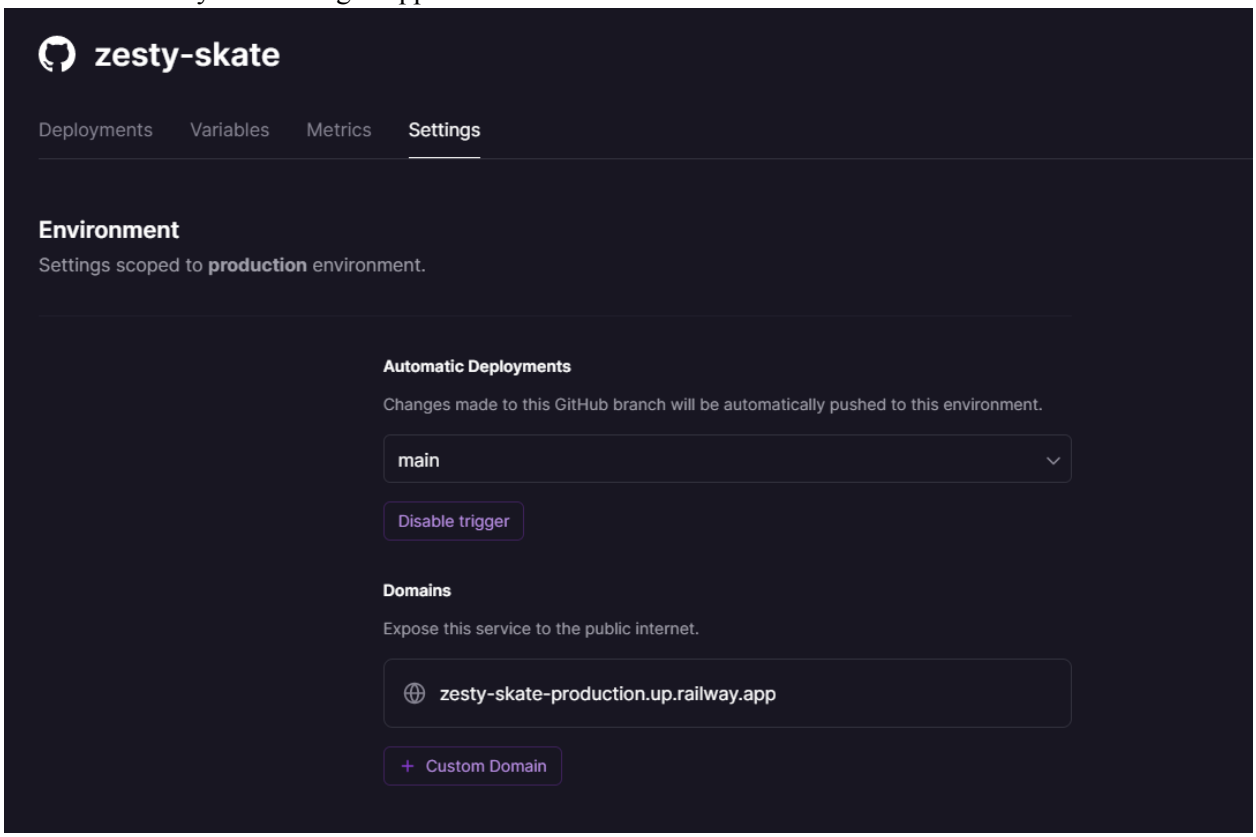
Here are the kid tasks and location page where you can see your child's location and assign or delete tasks

4.2.3 Railwayapp

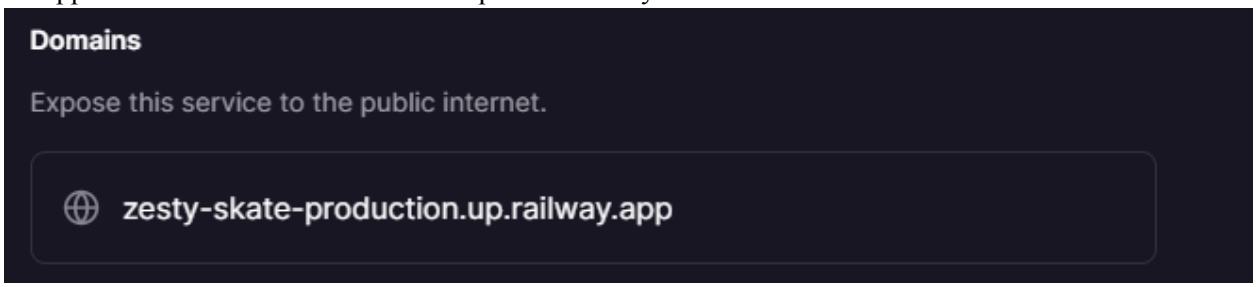
Railway provides a free online hosting server we used to use our application remotely



you can connect it to a GitHub account and then it will automatically host the server, building and deploying it will rebuild if any code change happens.



the app uses the domain to handle the requests remotely



4.2.4 Firebase Messeging& Firestore

Every device after signing in will get a token and this token is handled by Firebase.
Firebase messaging will handle the notification system

Chapter 5

Results & Discussion

5.1 Final Application

The final product is a mobile application that allows users to:

1- Create parent and child accounts and link them.

2- Parent can monitor their children.

3- Parents can see the location of their children on a map.

4-Parent can set and delete tasks for their children to do.

5- Parents can see their children's app usage.

5.2 Project Outcomes

Our application aims to:

1- Help parents to monitor their children remotely.
2- Save time for parents to know what their children are doing.
3- Increase the children's outcomes since they will know they are monitored.
4-Increase the comfort for parents.

Chapter 6

Conclusion & Future Work

6.1 Summary

Our project is a monitoring application for parents to keep track of their kids.
It is very important to keep our kids safe and focus their attention on them, KidSecure aims to provide that necessary and help the parents to monitor their kids to make the family feels safe.

We hope this application fulfilled the purpose for which is created.

6.2 Future Work

Some aspects to add to our application and improve:

1- Remotely control, lock and data wipe.

2- Remotely calls and SMS messages monitor for children.