AIS Hackathon 2024

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# Project Overview

I decided to make a lightweight, simple mobile app that would make it as easy as possible for AIS members and AIS officers to track event attendance and punch status. The app revolves around scanning member QR codes to keep track of attendance, making it easy, efficient, and fast to welcome AIS members to events.

# Tech Stack

## Frontend

The frontend is a React Native Typescript app bootstrapped with Expo. I chose to use React Native because it is popular, scalable, flexible, and well documented. Many IS students are familiar with React, and React Native has only a few differences, and they are relatively easy to get the hang of. Familiar tools will speed up development speed and promote simplicity. Typescript will also streamline the process, enabling developers to share types between the frontend and backend, reducing errors and increasing app cohesion.

Expo is a starter framework for native apps, and it makes it easy to hit the ground running. Developers do not need to deal with native code to develop apps using Expo. It is a great option for simple, lightweight projects like this one. There are certain limits with customizability when using Expo, but with a project like this, those limits will almost certainly not be a concern.

## Backend

The backend is a Node Express Typescript app with a SQLite database. A Node Express backend is the perfect choice for a small, simple backend such as this one. There will be just over a dozen endpoints, and they will be easily managed with Express.

I chose SQLite because it is simply free. The database will have only 3-4 tables with only a few thousand rows each, so any paid service would be an unnecessary cost.

# Cost Analysis

### Deployment - $30 initial cost, $8/month

The frontend will be deployed using Expo, and as of right now, their free tier is rather generous. Allowing 15 free small builds per month, and 1000 updated users without any cost. If limits are exceeded, there may be charges, but they will be minimal. There may be a higher cost up front with more frequent builds as the development process starts.

The backend will handle a maximum of 300 concurrent users, and a single EC2 instance could easily handle that load. Deploying to an AWS EC2 instance or Elastic beanstalk would be a easy and reliable way to deploy the backend. However, EC2 instances are not free, so this would cost a few dollars every month to keep running 24/7.

Expo deployments and EC2 instances are simple and almost free tools that will reliably keep the app running. They are not the most powerful tools, but they are the best for the job considering the small base of users, and they narrow scope of the project.