

# Project Charter: **Kadence**

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## **Problem Statement:**

Picking music is hard. Whether you're trying to decide on a soundtrack to your workout, discover new bands in your hometown, or just pick something that fits your current mood, finding the perfect playlist is incredibly difficult with just Spotify or Apple Music. Kadence is a playlist creation app designed to bridge that gap, allowing for users to create the perfect soundtrack for whatever they're doing. Kadence will feature multiple revolutionary modes, including a fitness mode that selects songs based on the user's heart rate data from a paired smartwatch, a mood mode that generates a playlist based on how the user is feeling, and a local artist mode that finds new and undiscovered bands right in the user's backyard.

## **Project Objectives:**

- Develop a mobile app using React Native (with Next.js) that connects to a user's Spotify or Apple Music account and smart fitness device.
- Create playlist generation "modes", whether based on real-time biometric data (i.e. heart rate) or based on moods to either calm or energize the user.
- Additional mode features include a timer mode (alternating between upbeat and mellow music on specified intervals) and a location-based mode to promote local artists.
- Use recommendation algorithms to mesh user's music taste and genre preferences with a focus on specific playlist types and discovery.
- Design a database to store settings and save preferences for users to be able to sign out and sign back in.

## **Stakeholders:**

- Users / Customers: The user base for the application will consist of people owning smart devices with biometric tracking capabilities (Apple Watch, Fitbit, etc.) that have an interest in music and playlist curation.
- Project Owners: *Jackson Rosenberg, Avery Schaefer, Nathan Simon, Colston Streit, Raymond Xie*
- Project Manager: *Avery Schaefer*
- Software Developers: The members of this design team will serve as the developers of this project.
- Development Manager(s): The GTAs of the course will provide assistance and act as the development managers for the semester.

**Deliverables:**

- A Next.js mobile app that allows users to generate playlists based on multiple factors, including mood, heart rate, and location.
- A Node and Express backend to handle requests and interface with the various APIs used for the application.
- A MongoDB database to store information relating to user profiles and associated playlists.
- A backend API for creating playlists, gathering relevant data for playlist creation and playing songs featured on playlists.

**Past CS307 Experiences / Projects:**

- Avery Schaefer
  - At the end of the project, we made our GitHub repositories associated with the project private
  - For my group's CS 307 project, we decided to make an iOS/Android app called Bussin. This app was a social event locator called Bussin, where users could create event items that would show up on a local map. Then, users could look at the local map to see which events were happening in the area, and choose to RSVP to an event if they wanted to. The app also had a social function, including friend lists and a "bussin score", which was a way of measuring how many events a user attended or created. We used a MongoDB database to store user and event information, as well as the Google Maps API for geographical data and the map element of the user interface.
- Jackson Rosenberg, Colston Streit
  - GitHub Link: <https://github.com/colstonstreit/CS-30700-Scholasticate>
  - Our CS307 project group created a web application called Scholasticate which was a social media based app focused on using location-based services and class similarity features to bring together students struggling on the same classes in close proximity and help them go from strangers to a collaborative study group. The website featured filtering and recommendation algorithms for finding similar students, pop-up notifications, and instant messaging capabilities. The entire goal of the app was to create a way to break the ice, allow for peers to come together, and boost academic cooperation across college campuses. We used a React.js frontend along with the JS Geolocation API to display a map of all users and current public study groups, Python / Flask for backend code, and a SQLite database to store account and study group information about the users so user data would be persistent after multiple log-ins.
- Raymond Xie
  - Github Link: <https://github.com/Xiaoyancg/CS307team12>
  - In CS307, we made a 2D game engine in C++ using the ImGui framework for our UI and OpenGL for our graphics rendering pipeline. Our aim was to provide a beginner-friendly introduction to game development with our game engine, and

we implemented features like entity creation, sprites, animation, basic logic, and a simple “VM” to run/test your games. We stored game data in the form of a json file.

- Nathan Simon
  - Github Link: <https://github.com/AndrewThomae/Ball-of-the-Wild>
  - My CS307 team made a 3D game in Unreal Engine 5 using a combination of C++ and their blueprint system. Our goal was to create an immersive multiplayer sports game. We included several characters for players to choose from each with a special ability. Players could play on different maps and had a total of 4 different game modes to choose from. Players were awarded experience and achievements based on their gameplay. We also included a ranking system to pit players of similar skill against each other. All our data storage was handled by Epic Games via their developer portal and SDK.