

MY (MUSICAL) LIFE

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Introduction

- Have you ever been in a sad mood and listened to sad music despite it not helping and making you even sadder? Do you typically play high-tempo music when heading to the gym and while working out at the gym? If you answered yes to some of the questions, *My (Musical) Life* app will be perfect for you! For people who love music, this app will be great to use on the daily. Our app will use data from multiple different, possible sources (location, calendar, time of day, etc.) to determine which song is the best to pipe directly into your ears. The app will require little user input, and the music suggestions will improve as the user continues to use the app.

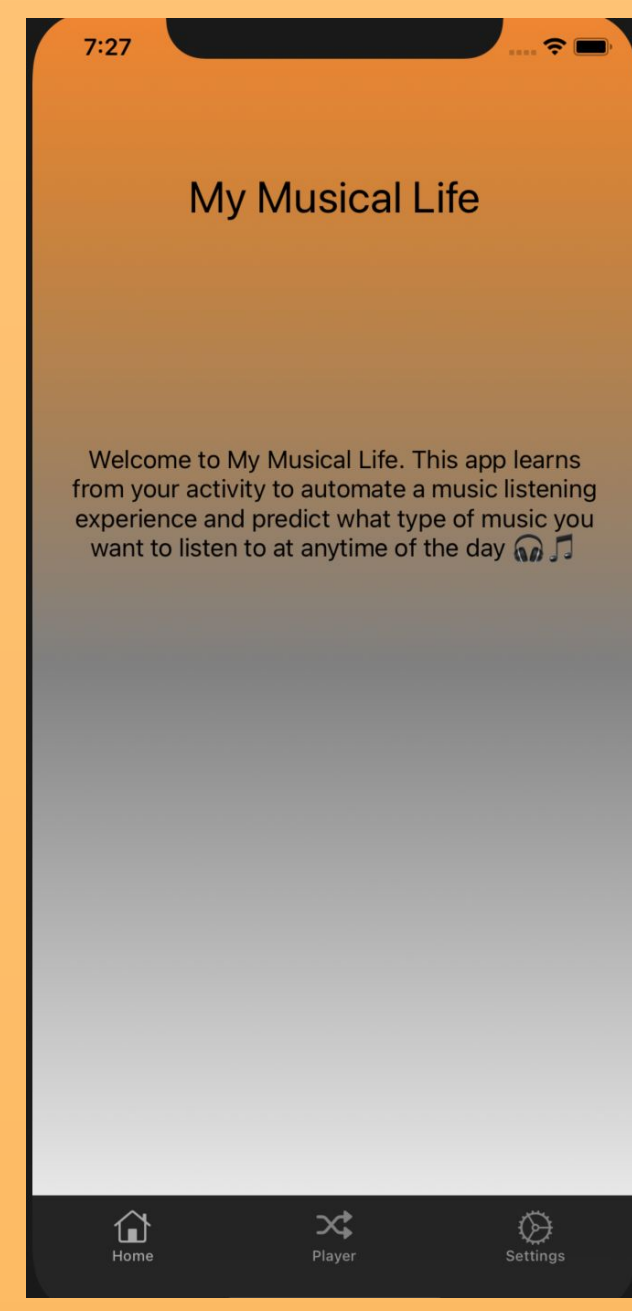


Figure 1: App Home Page

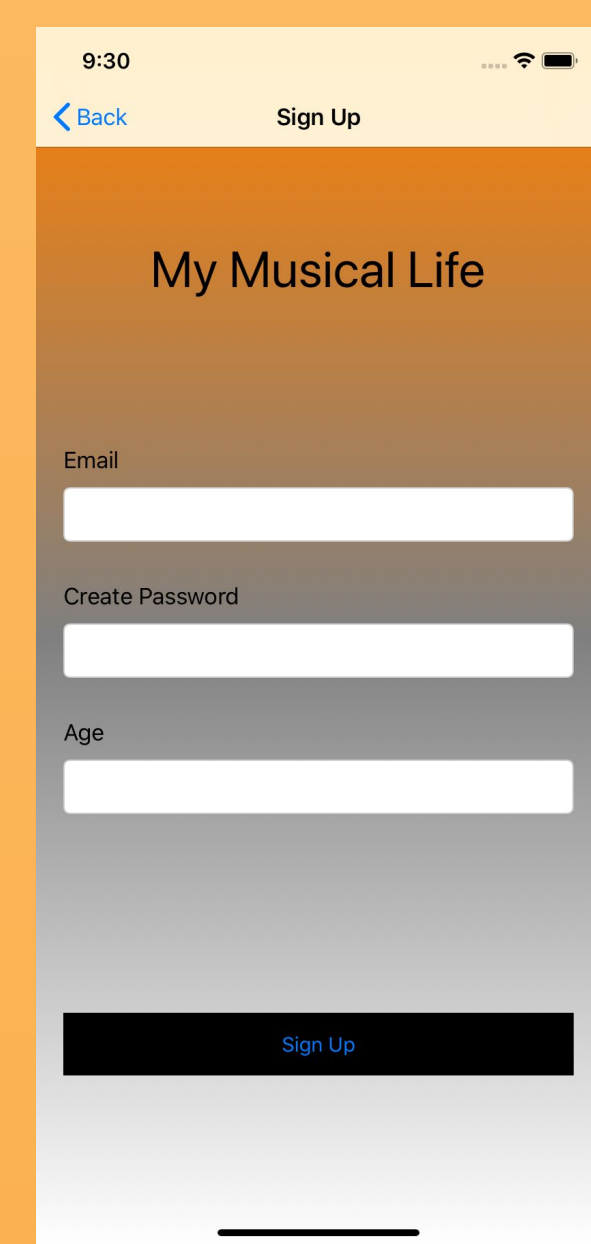


Figure 2: Sign Up Page

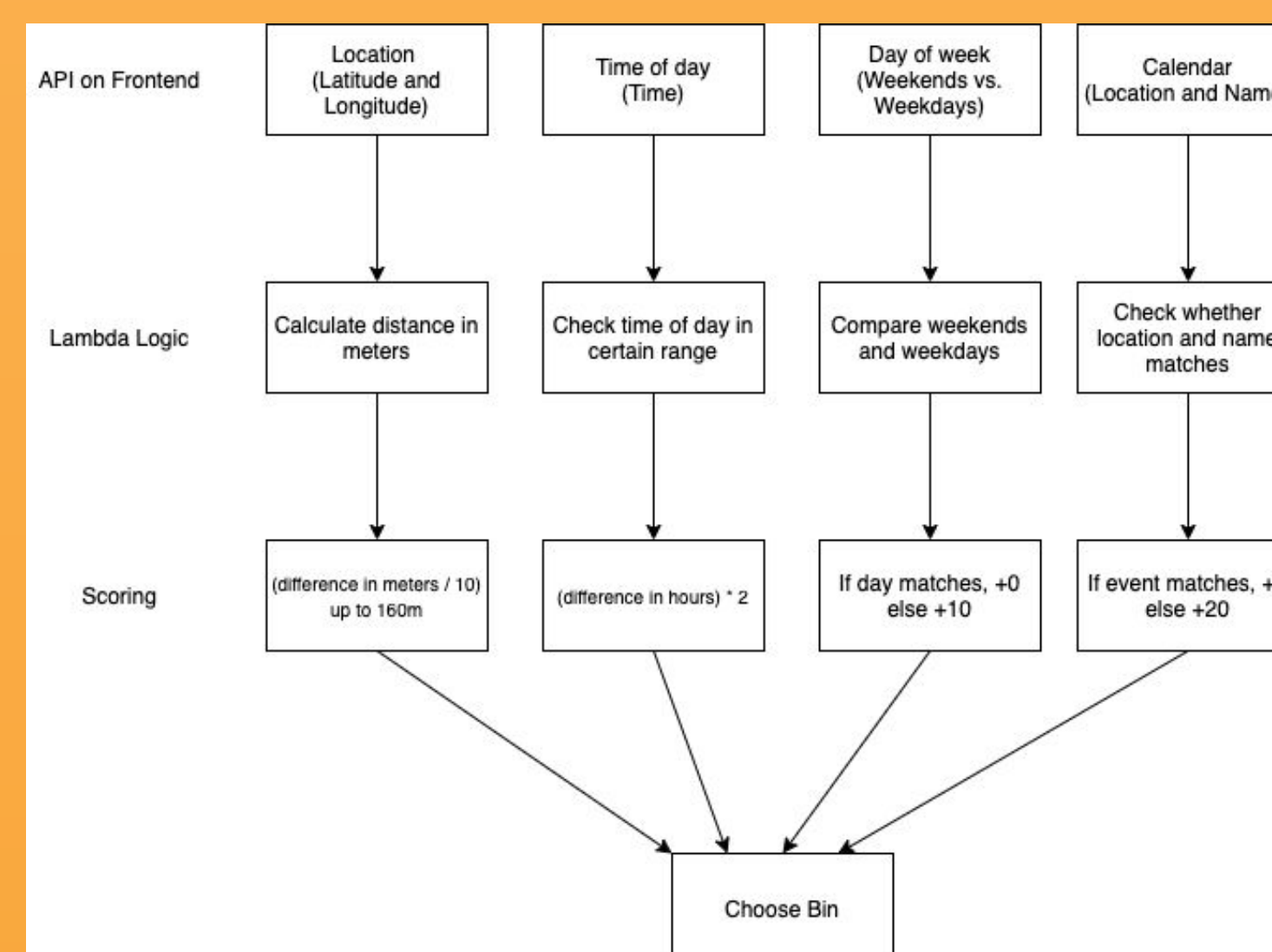


Figure 3: Feature Vector Workflow

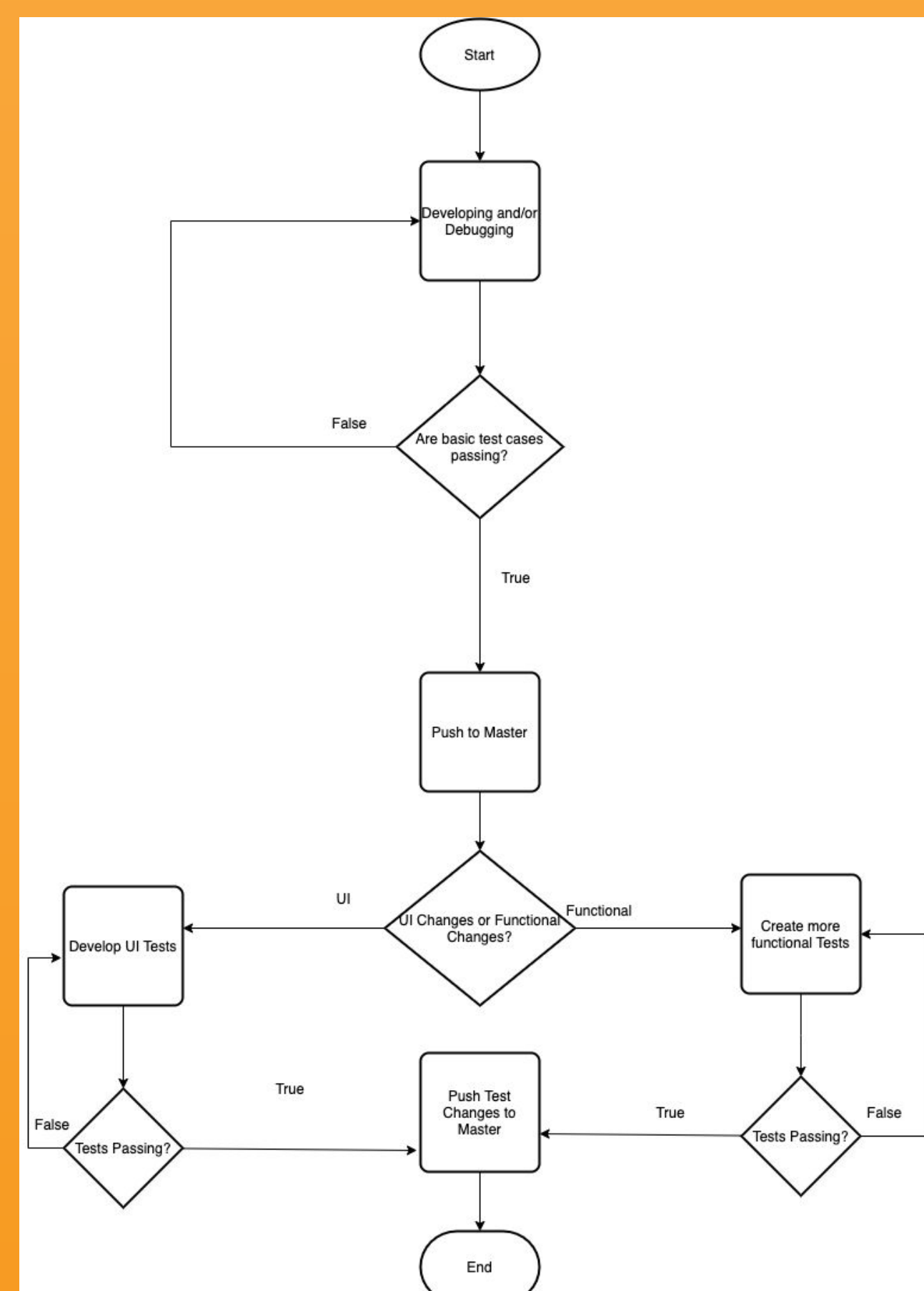


Figure 7: Testing Flowchart

Design Requirements

- Functional Requirements**
 - User Data (from mobile device)
 - Location
 - Schedule
 - Spotify Installed on iPhone
 - Music Recommendations
 - Mapping Sensor Inputs to Songs/Playlists
- Non-Functional Requirements**
 - Security (SSL, TLS, WPA2)
 - Account Logins
 - Location Information
 - Calendar Data
 - Music Preferences
 - AWS Security
 - Database
 - Lambda Data
 - Response Time and Performance
 - Crash Rate: 1-2%
 - API Latency
 - End-to-end latency: <3 sec
 - Operating Environment
 - Network reception in user's mobile device
 - iOS Device (iPhone)
- Engineering Constraints**
 - Apple developer account
 - Coronavirus restrictions limiting movement
 - Must have an iPhone
 - MacOS for development
 - Developing app for both Android and iOS
 - User Buying Spotify Premium Account

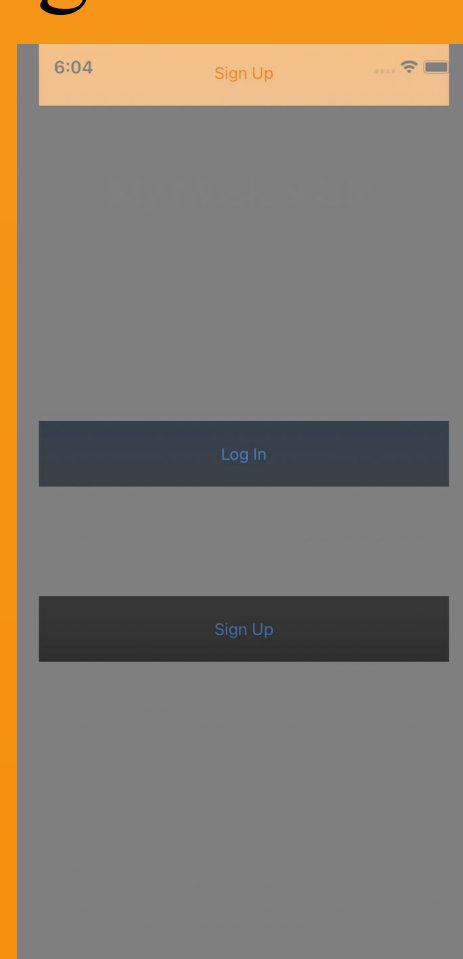
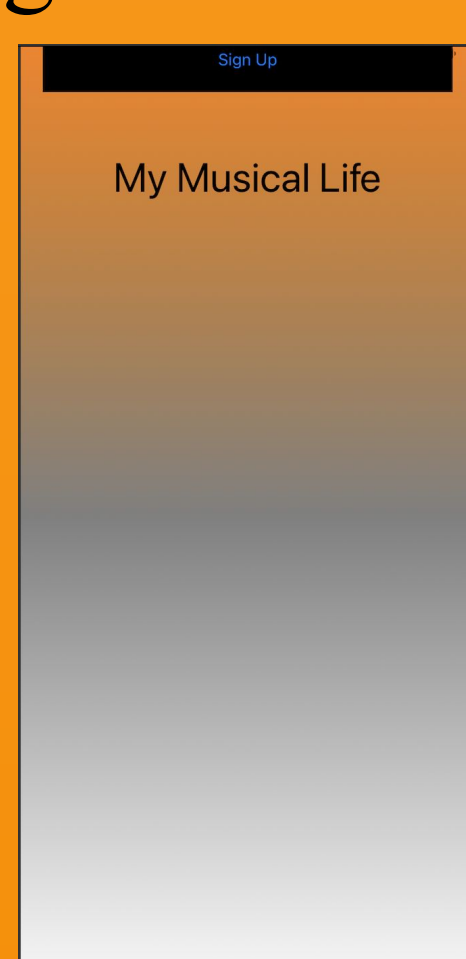
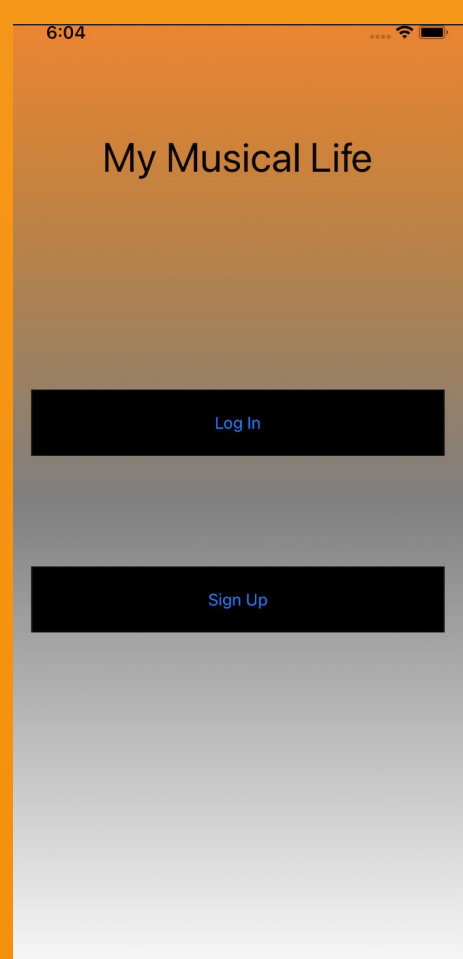
Testing

- Postman
- Using real life data
- Unit and UI Testing
 - iOSSnapshotTestCase (owned by Uber)
 - Takes a screenshot of the app (references)
 - Then, after taking the screenshot, the references are used to ensure that the user is seeing the same in the app and/or simulator

Figure 4: Reference

Figure 5: Failure

Figure 6: Diff



Design Approach

- Main Functional Modules**
 - Spotify, AWS Backend Functions, SQL Database (hosted by AWS), iOS Application (frontend), Local Storage/Device Data
- How does this achieve overall system functionality?
 - The connection of these pieces

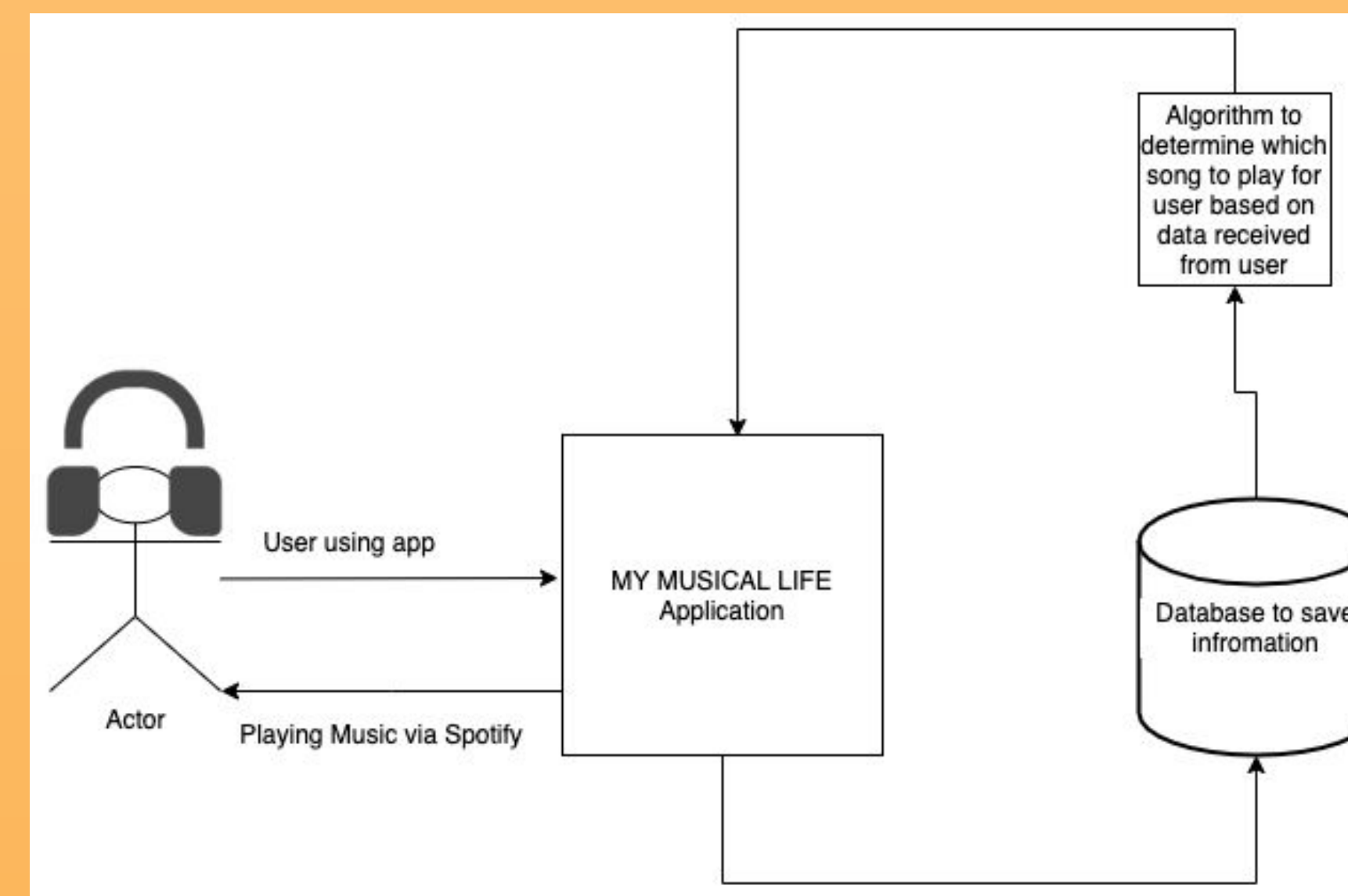


Figure 8: Conceptual Sketch

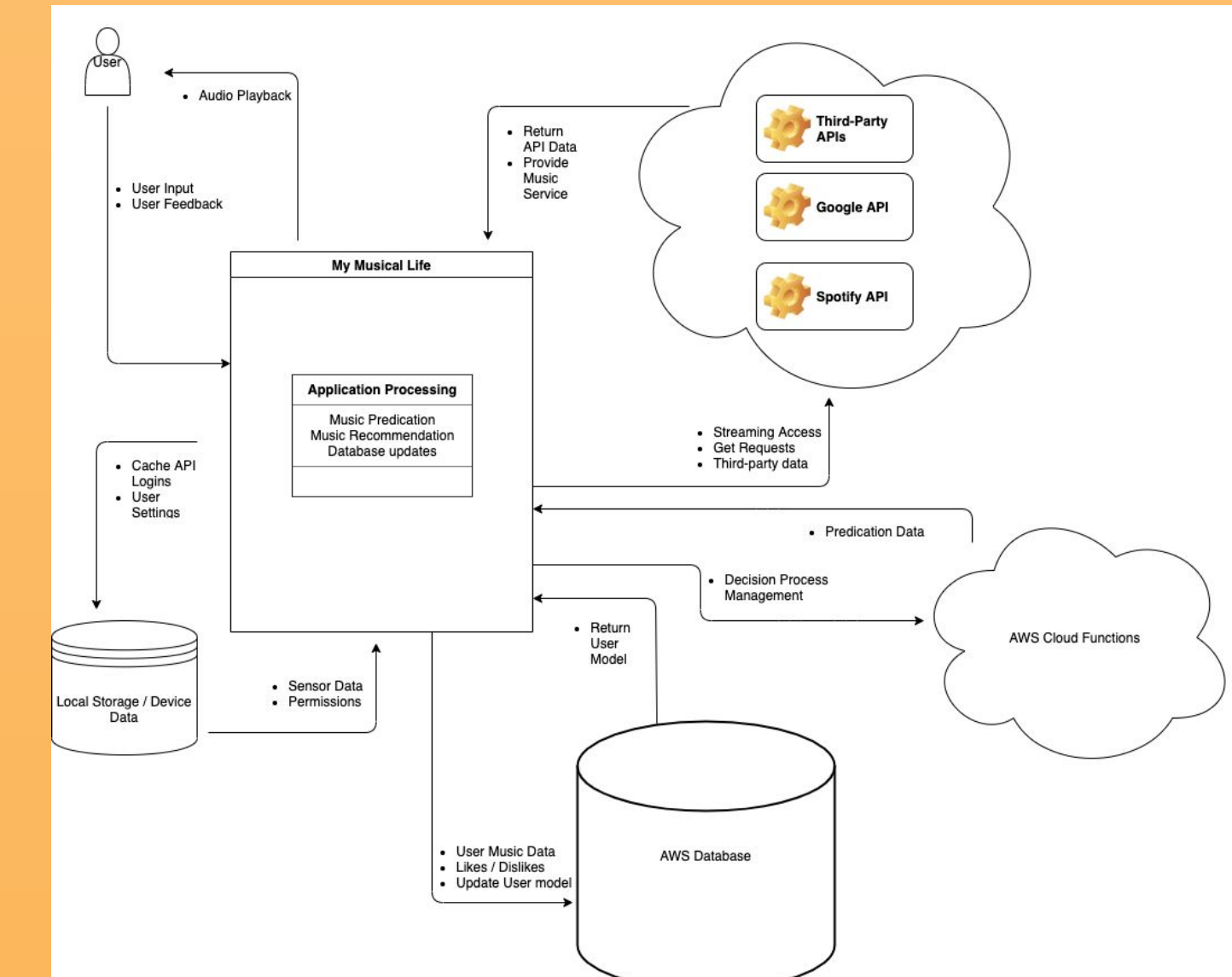


Figure 9: System Level Diagram

Technical Details

- Functional Modules**
 - Spotify
 - The team uses Spotify's API in order to generate music for the users
 - Start, stop, next, and previous functionality
 - AWS Backend
 - Backend functions REST API
 - Bin selection algorithm
 - SQL Database
 - Hosted by AWS
 - Stores user data, music preferences, and bins
 - iOS Application (Frontend)
 - Sign-Up/Log-In Functionality
 - Genre selection
 - Play music
 - User Interaction
 - Local Storage/Device Data
 - API Login
 - User Settings
 - Output sensor data and permissions
- Programming Languages**
 - Swift and Python
- Libraries**
 - AWS Amplify
 - Starscream
 - Reachability Swift
- Development Tools and Environments**
 - Xcode
 - Amazon Web Services

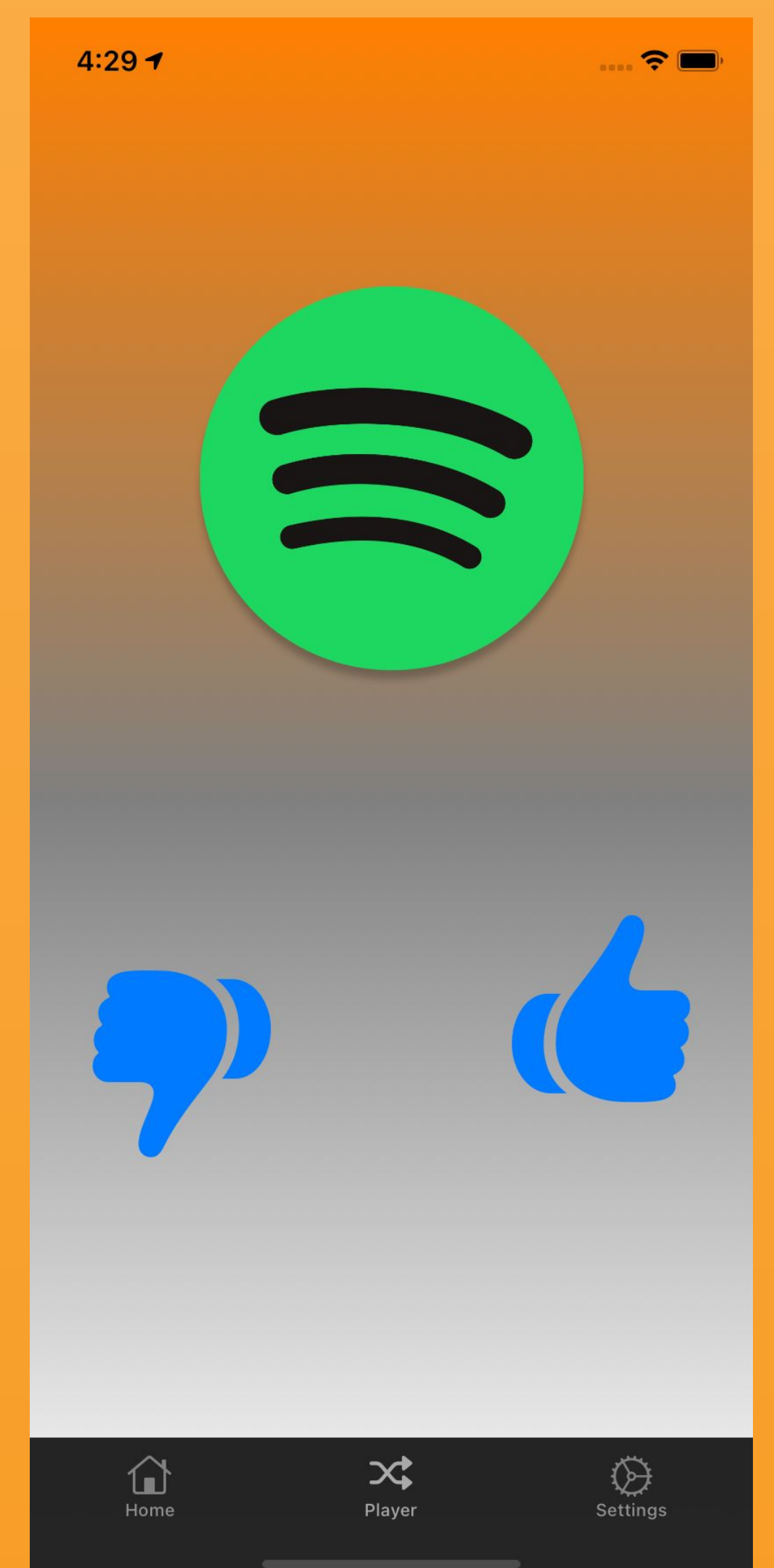


Figure 10: Music player screen

Intended Users and Uses

- Users**
 - Anyone can use this app!
 - Dr. Duwe
- Uses**
 - Anytime one wants music to automatically generate based on some factors

Calendar Name	Calendar Location	Day	Time	Lat, Long		
Cur	Study	Empty	Thursday	14:00	42.027663, 93.649207	
Bin A	Study	Park Library	Tuesday	15:30	42.020008, 93.648444	
SCORING:	+0, Direct Match	+10, comparing to Empty	+0, Both are weekdays	+4, 2 hour diff	+6.2, 62 meters apart	Total: 20.2
Cur	Study	Empty	Thursday	14:00	42.027663, 93.649207	
Bin B	Without	See Gym	Monday	19:00	42.014487, 93.653081	
SCORING:	+20, no match	+15, comparing to Empty	+0, Both are weekdays	+10, 5 hour diff	+150(max), > 160 meters	Total: 56
Cur	Study	Empty	Thursday	14:00	42.027663, 93.649207	
Bin C	Park	Home	Friday	18:30	42.021881, 93.648444	
SCORING:	+20, no match	+10, comparing to Empty	+10, Fri in weekend, Thurs is weekday	+8, 4 hour diff	+160(max), > 160 meters	Total: 64

Figure 11: Results from Bin Selection Algorithm with Real Data