Project Fitness: Gym-going Convience

Introduction

Project Fitness is intended to provide useful information for gym-frequenters to get the most out of their visits. By mapping busy times of day throughout the week for different months, and the facilities generally used at different times, one can plan to go to the gym for weightlifting, for example, at a time when most people are either there for cardio or basketball, so the weights should be nearly empty. By using predictive numbers, one can anticipate the optimal time fitting his/her schedule to fit in whatever they want to do, even accounting for events, such as game days or finals week.

Design

Project Fitness is made to have a simple interface with a main screen that drives the majority of the functionality. The primary focus of this screen is a line graph representing the population info for the current day. This graph will have two different views utilizing a toggle to allow the user to pick the one they prefer. The first view will show the total recorded population throughout the day up to the current time and from there extend the total predicted population to the end of the day. The second view differs in that it shows the up to date and predicted populations of the individual regions of the gym, which can be modified to display the trends relevant to the user. Right below this graph is a side to side string of buttons allowing the user to pick which day of the week they want to view. The displayed week can be altered by either selecting the left or right arrow at the top of the screen, or selecting the button in between them to launch a monthly view. The top right corner will hold an options button that allows the toggling and editing of the graph.

There will be a scheduling page that lets the user enter his available times throughout the week. The app will then use the provided available times with its scheduling algorithm. As youd expect, the algorithm will choose hours of the day where the usage is at its lowest for each region of the gym.
Pseudocode

function chooseRegion (hour) //return which region will be the least populated
    bestRegion = climbing
    bestPopulation = historicalPopulation(bestRegion, hour)
    for each region in regionSet
        //see what the past data says about the population
        predictedPopulation = historicalPopulation(region, hour)
        //if this regions population is smaller, then recommend this region instead
        if (predictedPopulation < bestPopulation)
            bestRegion = region
            bestPopulation = predictedPopulation
        end if
    end for
    return bestRegion
end function

function historicalPopulation(region, hour) //perhaps make this more sophisticated
    averagePopulation = 0
    //read the database entries for this region and hour
    //then store this in populationDataSet
    for each item in populationDataSet
        averagePopulation += item
    end for
    averagePopulation /= populationDataSet.length
    return averagePopulation
end function

Main Page Graph Example

![Graph Example](image-url)
Related Work

Many gyms already track the user count, but only as a result of making sure users are actual members. They can then use this information to see how often a particular member uses their facilities and to see how often their gym is used on particular days of the week. This information, however, is private and exclusive to the gym management. Meanwhile, fitness apps track personal fitness data, which is very specific in workout tracking, but doesn't do anything to help gym-goers plan their workout times, including their own users. Attendance tracking isn't overly novel; many facilities use it to be sure no one is missing come close time, or in the Nasir article mentioned, to ensure students are where they should be during school time. Also, tracking more specific movement indoors has its advantages, as well. In the Foxlin paper, he writes of shoe sensors being used for emergency personnel like firefighters in evacuating a building.

Current Status/Goals

The team is still unfamiliar with Android development, so most of the work until now has been related to learning how to work in an Android environment.

The apps design for the most part has been finalized at this point, so the implementation of the design is what remains.

The process of implementing the app is split into two parts: raw data and analytics. With two months remaining, each of these parts will be the primary focus of each month.

The raw data part entails everything related to drawing the population lines. The database needs to be populated with historical population numbers. The app will need to pull this information from the database. The app will then display both real-time and historical population data.

The analytics part will encompass the scheduling algorithms and various UI options. The scheduling aspect is the most advanced feature of the app, and will build upon the work of the previous month. The various interface features will also improve upon the usability of the app for an end-user.
References


