Tasteful Panthers: Food Recommendation at Dining Hall
Project Plan

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Goal and Motivation

The goal and motivation for this project is to remedy the pain of students not knowing what to eat at the campus dining hall. The users are unsure of what to eat when they enter the dining hall because they lack confidence regarding the quality of their chosen meal and there is no current system in place to alleviate this pain. To solve this problem, our mobile application will allow users to see recommendations each and every day for the campus dining hall. This will lead to increased user satisfaction because of the fact that they will now be able to enter the campus dining hall with confidence on what they want to eat and the quality of the food. Given that the recommendation of the day will be based on other student reviews this will lead to an increased number of students having improved campus dining experience.

Approach (Key Features)

1. Users can view a personalized recommendation of what meal they should eat each day.
2. Users can enter, view, or search reviews.
3. Users can receive GPS based notifications when entering or leaving the dining hall.
4. Users can participate in contests with a leaderboard
5. Users can suggest future meals
6. Kitchen staff can search, view, and comment on reviews.

Novel Features and Functionalities

A novel feature of our mobile application is the feedback system for kitchen staff. This is a novel feature because of the fact that this allows the kitchen staff to use the collected data (reviews) from students to make improvements. This feature will allow the kitchen staff to use the students' reviews to figure out the meals that students did not enjoy along with the meals that the students did enjoy so that they can make decisions for the next week accordingly. Therefore this feature is beneficial for both the students and the kitchen staff because it provides a way for the students to truly have a way of voicing their concerns with the campus dining hall along with a way for the kitchen staff to use that information to improve each week.

Algorithms and Tools

- The first algorithm will be used to find people with similar profiles. We will be able to do this in two different ways.
- The first way being by their profile and the second being by their reviews. Say there are two people, one person likes sweet flavors and the other prefers spicy, these two people would not be a match. However, two people who both like spicy food would be a match.
- When comparing reviews we would look for if two people both reviewed the same dishes or very similar dishes. If two people both review a lot of dishes that revolve around chicken, they probably have similar tastes.

Algorithms and Tools 2

- The second algorithm will be used to determine what meal to suggest to an individual. We will do this by first finding someone who has similar taste and then comparing the meals we know both people have tried.
- For instance, say we have person one who has eaten and liked meals A, B, and C and we have person two who has eaten and liked meals B and C, but not A.
- Our algorithm will suggest that person two try meal A due to the similarities between the flavor profiles of person one and two.

Algorithms and Tools 3

- A useful tool we will use is Android Studio. None of the group members have an android phone, but the application will be an android app. We've chosen to remedy this by using the emulator that is a part of Android Studio. This emulator will be extremely useful when it comes to testing our application.
- We will also be learning to use Android SDK. This kit includes tools and libraries to make it easier to create android applications. Android SDK will be extremely useful when building this application, especially because none of our group members have done this before.
- ADB is a tool we will use to debug our application on the emulated device we will use from the command line. This tool will be extremely helpful during the testing process.

Algorithms and Tools 4

- Databases will be used to store data, such as user/admin accounts, meal suggestions, reviews, and leaderboard scores. This manages the data while also making data easily retrievable. Some options for this are Firebase Firestore or MySQL.
- Location services are necessary for the GPS based notification system. We will need this for geofencing so we are able to tell when students are entering or leaving the dining hall. Two options for this are Google Play Services Location API or Android LocationManager. 9. An API manager will be needed in order to design, test, and document communication between the application and backend server.
- A Cloud hosting service will allow us to use the backend server and database. This will ensure that the app is accessible and reliable without using physical servers. Heroku is a good service for beginners, however, we may need to use something like Google Cloud Platform for this task

Technical Challenges

1. Understanding the Android Ecosystem (Android Studio, Genymotion). Most group members have very little experience, if any in regards to building or emulating Android applications.

2. We must become more familiar with Android SDK (Software Development Kit) and ADB (Android Debug Bridge) .

3. We must learn the programming languages that are used when developing Android applications. The main languages used are Kotlin and Java.

Milestone 1 (Sep 30): Itemized Tasks:

- Compare and select technical tools for android app development environment, android app development language, libraries/modules for features in the app.
- Provide small “hello world” demo(s) to evaluate the tools for the environment, the language, and the libraries/modules.
- Resolve technical challenges 1, 2, and 3 by becoming more familiar with Android studio, Android SDK and ADB, and the language, Kotlin.
- Compare and select collaboration tools for software development, documents/presentations, communication, task calendar.
- Create Requirement Document
- Create Design Document
- Create Test Plan

Milestone 2 (Oct 28): Itemized Tasks:

- Implement, test, and demo diners enter/view reviews.
- These reviews will be stored either through replication or a centralized server. We will most likely use a centralized server.
- We will need the following in order to do this:
    - Some type of backend framework such as Spring Boot in order to handle HTTP requests, process data, and communicate with the database.
    - A database to store the reviews made by users
    - A cloud hosting platform to host our backend framework and database.
    - API management in order to ensure smooth communication between the application and backend server.
    - Some type of authentication in order to ensure only authorized users can submit reviews. The purpose of doing this is to protect the integrity of the app.

Milestone 2 (Oct 28): Itemized Tasks 2

- Implement, test, and demo diners searching reviews.
    - Search by tags
- Implement, test, and demo kitchen staff search/view/comment on reviews.
    - Search by tags ○ Can comment on reviews, but cannot leave reviews

Milestone 3 (Nov 25): Itemized Tasks:

- Implement, test, and demo personalized recommendations.
    - First, consider likes and dislikes and then consider their existing reviews
    - Then, match the user with other users with similar taste and compare their reviews.
        - If person 1 likes meals A,B, and C and person 2 likes B and C but has not tried A, then suggest meal A.

Milestone 3 (Nov 25): Itemized Tasks 2

- Implement, test, and demo GPS based notification system.
    - We will need location services in order to determine where the user is.
        - Possibly Android LocationManager or Google Play Services Location API
    - Geofencing to define the boundaries of the specific location of the dining hall. Google Play Services can also be used for this.
    - We will need a notification system to notify users before entering and after leaving the dining hall. Android NotificationManager can be used for this.

Milestone 3 (Nov 25): Itemized Tasks 3

- Implement, test, and demo contests with a leader board.
    - We need to implement the logic of the contest. There will be a theme for each week such as good for studying or good for working out. The more reviews, the more points you gain. The top 3 people with the most points will get some type of incentive such as school merch.
    - A database to store the details of each contest.
    - We will need real time data updates to automatically update the leaderboard. We could use Firebase RealTime Database for this.
    - We will need a user interface in order to display the leaderboard.

Milestone 3 (Nov 25): Itemized Tasks 4

- Implement, test, and demo suggesting future meals.
    - A user interface will be needed in order to make it easier for users to suggest meals.
    - A database to store all of the suggestions. ○ An admin interface for kitchen staff to view the results.