CS 411 Project

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Project Title	NoMoreWait
Project Summary	Using a dataset from Yelp containing information of restaurants in the United States and Canada, our database application will provide online booking for customers, targeted for foodies who love food and still would like to eat in restaurants during this pandemic period.
Project Description	● **Description of an application of your choice.** NoMoreWait is an online restaurant reservation system, this app makes it easier to discover restaurants and book reservations at more than 60,000 restaurants around the US and Canada. Customers can use our hospitality solutions to manage their reservation booking. This system will assist both restaurants in their daily operation and customers waiting time. ● **Usefulness.** It is common for people to use online booking for their restaurant choosing. There are similar applications in the market, such as OpenTable and Waitlist Me. However, our system is more focused on the COVID-19 social distance regulation, to let customers not only enjoy dishes but also pay attention to their health. We have special information about whether restaurants are “dine in” or “to go” only, whether it can be “indoor” or “outdoor” only, and curfew regulations in different cities. Our target group are foodies who love food and still would like to eat in restaurants during this pandemic period. ● **Dataset.** The dataset includes following information about restaurants. First, location (city, latitude and longitude and address) and name of restaurant are included. Secondly, it includes opening hours and days of restaurants throughout the week. Also, the dataset includes customer reviews (# of reviews and star of reviews) to indicate popularity of restaurants. Lastly, in order for customers to choose their desired restaurants, the dataset also contains a list of attributes of the restaurants, including whether the restaurant has outdoor dining, whether the restaurant provides take out or delivery, whether the restaurant needs in-advance reservation etc. We could utilize these information to build the reservation platform.

- **Description of the functionality that you plan to offer.**
  - **Basic Functions**:
    1. Users should be able to search and book restaurants by criteria such as datetime, party size, city, cuisine, services, etc.
    2. Users should be able to modify or cancel existing reservations
    3. Participating restaurants should be able to add upcoming seating and open hours
    4. Indoor dining restrictions can be applied to restaurants by region
    5. Admin should be able to manage app data
  - **Advanced Function:**
    Restaurant recommendation Service:
    1. You need to have 1 advanced function.
    2. What is it: this is a microservice only for restaurant recommendations purpose providing a list of popular restaurants by given criteria.
    3. Why is it cool: this service is focused on providing the best-matched restaurants and experience to the users
    4. Why is it technically challenging?
       - Real-time. Recommendations are always up to date
       - Need parallel processing and updating recommendations
  - **Non-relational Database Function:**
    Redis is chosen to help improve user experience, system high availability and provides additional features that SQL database cannot.
    1. Redis provides a highly available in-memory cache to decrease data access latency, increase throughput, and ease the load off our SQL database. For example, for the resources that users access frequently like all cities, recommended restaurants, etc., we can move them to Redis
    2. Redis could be used as message queues for asynchronous tasks. For example, we need to hold unconfirmed reservations, and cancel reservations once they are expired. A cancel task is created every time when a user books a table but has not been confirmed yet.
- **Advanced Techniques**. Use 6 or more advanced techniques from the following list. (You can decide this later)
  - Indexing
  - Transaction
  - Triggers
  - Partitioning\Sharding
  - Prepared Statements
  - Compound Statements

ER Design	• Assumptions:
	  o Each restaurant has at least 1 table.
	  o Each table can have at least one availability.
	  o A user can book multiple tables.
	  o Each order belongs to only one table.