CMSC 122 Final Project Proposol

Team-Beaver

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1 Project Goal

When people explore new cities or neighborhoods, they often want to sample the nightlife. Yelp can give recommendations for a specific location and Google Maps can provide directions, but if you want to visit multiple bars or you want to compare bars near you, there is no feature that can recommend an optimized itinerary that accounts for your drinking preferences while minimizing walking time between bars. Our goal of the project is to create a web-based application which allows users to acquire information on Chicago nightlife by integrating the functionality of Google map and Yelp to create a more personal-oriented application.

More specifically, we would like to make a bar crawl generator with an interactive map along with the informations of bars and drinks based on user-entered preferences. It will be an easy to use search tool where the user can enter their location, drinking preferences, number of bars to visit and maximum walking time between bars. The bar crawl generator would then use an optimization algorithm on data scraped from the Yelp API suggest an itinerary. This tool could potentially be expanded to other categories of business that are often sampled by tourists, like coffee shops, bakeries, and museums.

2 Data Description and Acquisition

We are mainly going to use data from two sources, namely the Yelp API and GPS locations from Google API.

2.1 Yelp API

We will use the Yelp API provided online for Yelp developers get data on all bars in the Chicago neighborhoods that we will initially target. The bar name, location, ratings, and reviews will obtained through the Search API by scraping data from all the businesses returned from the category filter "Nightlife" and location filter "Chicago".

To store the data, we will generate a sqlite3 database with the names, location data, and ratings and assign each bar a unique ID. We will also create an inverted index with search terms that map to bar IDs. The search terms will be generated from scraping the reviews of each bar.

2.2 Google Map API

We will use the Google Map API to overlap our scraped data from Yelp on a customized Google map. We will pull driving and walking directions and other relevant street profiles from the Google map database to make the visualization for our street crawler. des

3 Project Break-down

The first thing in our project is to getting familiar with Google API and Yelp API as well as Django later for creating our website. In the process of learning these APIs, we will start scraping data from Yelp and Google Map.

The next thing in our project is to design our user interface and to think how user will interact more efficiently with the website. In the process of designing, we will write the basic web content using HTML and later add design using CSS and in the end adding Javascript for all functionality.

Next we will move on the server-side, i.e. back-end of the website. We will use the database we have created and write search engine and incorporate optimization algorithms. Finally, the

interactive map will be integrated.

Finally, we will move on to testing phase. A lot of testing will be done in pieces as we build up our website functionality.

We haven't carefully break down the tasks to each person yet, but here is a sketch.

- Learning phase on Yelp API, Google Map API, Django: all members of the group
- Database creation: all members of the group
- Website/user-interface design and implementation: Yutong, Kwako, Davis
- Search engine and optimization algorithm: Denise, Yutong

4 Time-line

Below is a sketch of the time-line for our project. Minor changes will be adjusted as we move along with the project.

Week 1

- Scrape data from Yelp API into SQL database and inverted index
- Prototype of user interface of website/app

Week 2

- Write and test optimization algorithms
- Get search functions of web interface working

Week 3

- Integrate optimization algorithm to search function
- Add interactive map to website

Week 4

- Add additional content to map, like highly recommended bars that don't completely for the search terms, or locations of public transportation hubs

5 Data structure, new technology, and algorithm

In the course of our project, we will learn quite a few new technologies and data structures. Here is a list of them:

- Google Map JavaScript API.
- Yelp developer API.
- Django interface for creating our webpage.
- Languages will be mainly in Python and Java. HTML, CSS, and JavaScript will also be used.

As we move on with the project, we are also likely to write class structure to deal with processing and analyzing data. The main new algorithm we are using is so-called Walking-Distance Optimization algorithm (Dijkstra's algorithm). We will learn more as we move forward.