Date Night!

A play in three acts… perhaps four

Introduction

Planning a date night is a tricky affair. What to do? Where to go? What to eat? Is there entertainment? Do we get drinks afterwards? How should we get from one place to another? All these questions must be painstakingly researched and answered while making your boss believe that you're working on that overdue report. If only your report was on city traffic planning, then you wouldn't have to worry about your boss seeing Foursquare maps on your screen. Alas, your report is on the rate of sewage pump failure at political conventions, a topic that doesn't typically lend itself to romantic engagements.

So you must plan your date quickly, and it must be a REAL date. A "date" is defined by the International Society of Don't Screw This Up as

> *date* (n. fr. medieval Latin)
> 1) *the time at which an event occurs,*
> *2) the brown, oblong edible fruit of a palm (Phoenix dactylifera),*
> *3) an outing comprising food, film, and fine beverages (necessarily in that order) with a person in whom you are interested romantically but have absolutely no chance if you screw this up.*

The stakes couldn't be higher! If only there were a service to plan the date automatically. 🤔

Business Problem

As a startup seeking an easy means to help the helpless plan "real" dates, we look to leverage Foursquare to quickly identify "date triples" in a given city. A "date triple" is a group of venues within close proximity of each other where one is a restaurant, one is an entertainment venue, and the last is a bar. The user of this kind of service could further refine the results based on dietary preference or neighborhood, but that is outside the scope of this initial prototype.

Data

Our algorithm requires three primary types of data

1. User Location and Range

The user's city by geographic coordinates and a radius.

2. Venue Categories

Foursquare provides a hierarchical list of categories that allow us to query different types of venues. Reviewing this list, we select the following venues of interest:

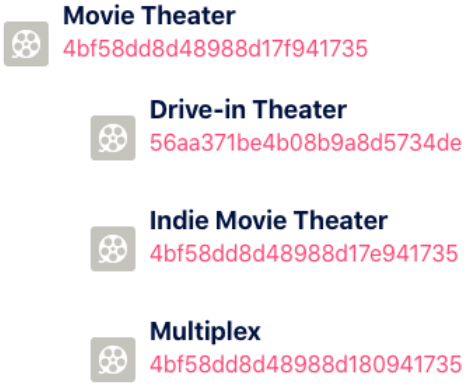

Figure 1. Sample of Foursquare venue categories

Date Triple Group	Foursquare Venue Category	Foursquare Venue Identifier
Restaurant	Food	`4d4b7105d754a06374d81259`
Entertainment	Arts & Entertainment	`4d4b7104d754a06370d81259`
Bar	Nightlife Spot	`4d4b7105d754a06376d81259`

While Foursquare's categories aren't perfect for our purposes, we'll start with the most coarse categories and differentiate between options using clustering.

3. Foursquare Places API

We will use the Foursquare Places API to gather venue data, specifically version 2 of the venues/explore endpoint. Given the near-ubiquity of restaurants in any given city, we center our search around entertainment venues, then fill in the gaps for restaurants and bars based on where the entertainment venues are.

The venues/explore endpoint returns JSON-formatted text, of which the following fields are of interest:

JSON Path	Description
`response.groups[].items[]`	An array of venues matching our query
`item.venue.id`	The unique Foursquare ID of the venue
`item.venue.name`	The venue's name
`item.venue.location`	The venue's latitude and longitude
`item.venue.formattedAddress`	The human-readable address of the venue
`item.venue.categories[]`	The categories in which the venue is placed