



Trekomender

The Transcendent Social Travel System

CSCE 676

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Introduction

There are multiple factors that play a significant role in determining a tourist choice of a vacation destination such as affordability, availability of activities, and popularity. Despite the mass of content available on the world wide web, the efficiency of utilizing it to find a destination that meets all the criteria of a potential traveler is always questionable. As we know, recommender systems are playing an increasingly important role in enhancing user experience. On Netflix, for example, 80% of movies watched are now the result of recommender systems.

Problem Background

Today, some traveling websites are ambiguous for recommending places in traveler's preferences. User must search for places before selecting the destinations, we are focused to provide user list of places what meets his/her requirement to visit any place. We found a need for a website that is user friendly in terms of answering the question: "Where should I go?" rather than "What does the destination have?".

Motivation

Our motivation is to help travelers to decide which are the best destinations to them by offering a user-specific recommendation system.

Goal

Our goal with Trekomender was to create a travel recommendation source with the simplicity and ingenuity similar to many familiar search engines, which helps the user to make their decision of where to go much easier.

Related Works

There are some related projects and articles that act as inspiration to us, as an example of a project is a <u>Travel Recommendation Engine</u> that offers smart destination recommendations introduced by the Amadeus AI Research team. Moreover, we found also one useful article from ELSEVIER which focus on finding destinations that meet all the criteria of a potential traveler. The title of this article is <u>A Multi-Level Tourism Destination Recommender System</u>.

Data Sources and Collection

GitHub nomadlist and google scarp

Overview

- **Tools:** Extracted web-data using these web scraping tools: Scrapy, Selenium
- **Dataset:** Nomad List, Four Square, Gowalla, Tripadvisor, Google Travel. Tried to use more data, but only kept a few data because we want to make proof of concept out of minimum data that works for our use case.

Details

• First iteration

- Four Square website, we have started from collecting data such as latitude, longitude, and country code. We figure out that the data is very detailed so we discarded it.
- Gowalla website, we collected graphical data based on destinations but it had many biases since it is specific to the United States so we discarded it as well.

Second iteration

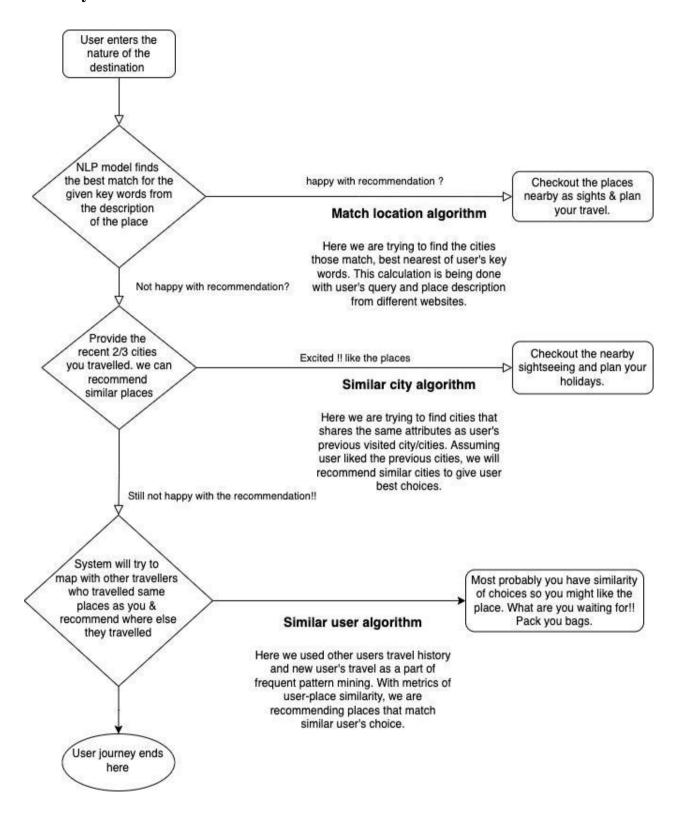
- Nomad List, this is a more generalized data that has a simple travel history of individuals. We use google scraping tools like Selenium and Scrapy to extract data from the website. We have successfully extracted 200 records with more than 3000 traveling destinations.
- We also collected more than 200 cities with descriptions and most popular visited places.

Proposed Solution

We created a recommender system based on geosocial influences and attributes taken from Google travel, similar city and user based place selection that produces meaningful results for up to 10 recommended destinations based on the insight taken from user description of the destination expectation.

Evaluation & Analysis of Results

• System Flowchart:



Implementation

• System-User Interaction:

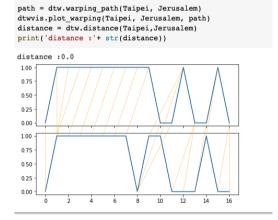
We have transformed user input to embeddings and used these vectors to search on multi-dimensional search. We expect that this would help us match user input with destination description.

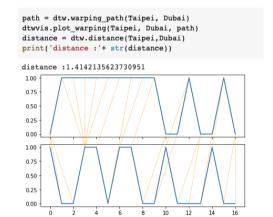
#Github page best match implementation both in Haystack and BM25

• Entity Similarity:

We used nearest neighbors to find the cities that share similar attributes and validated the result using DTW.

EX- Distance between Taipei and Jerusalem vs Taipei and Dubai





• User similarity (beta version):

We found frequent patterns with external user travel histories and applied association rules with new mapped users using fp-growth.

System Specifications

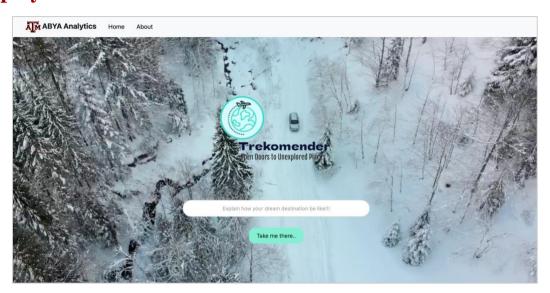
• **Application:** Flask using python and spark

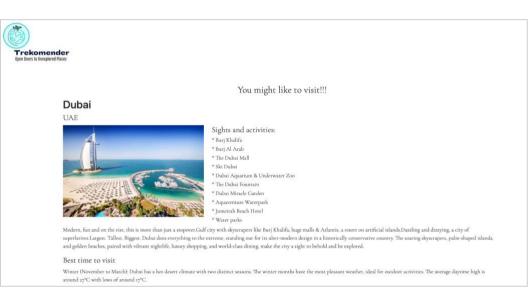
• User Interface (UI): Html, CSS, Bootstrap, Jinja

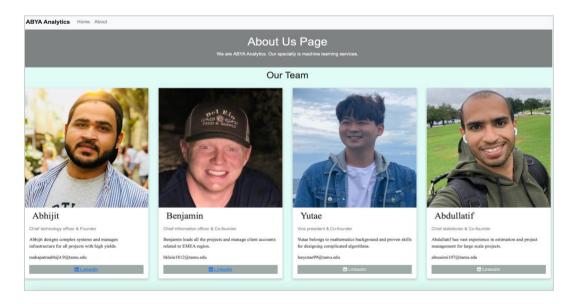
• **Algorithms:** Bestmatch25, Haystack, LSH, ANN, k-means

• **Deployment:** Heroku, AWS

Deployment Screenshots







Trekommender and Social Good

• Offer advice and direction:

Trekommender can offer advice on where to go and what are the best places to visit that fits your need. Our system will act as a friend and a consultant.

No cost at all:

Instead of going to a travel agency and suggest to you some places to go, you can use our website which is completely free to have an overview of what are the choices you have.

• Time efficient:

Searching on destination might take some time, we offer a one-stop website that will help you decide where to go based on a robust algorithm.

The Way Forward

There are many ways to improve and enhance the performance of our recommender system:

- Increase number of cities with more attributes and descriptive words
- Finding more data sources that offer travel history of individuals
- Real time trend: make our system scrapping information in real time
- Utilize google map and its reviews to validate and add more destinations

These are potential areas of improvement that will make our recommender system more robust and agile.

Conclusion

As we mentioned in the introduction, recommender systems are becoming essential in many industries and, hence, have received more attention in recent years. Applying what we learned in class with other data mining and user interface algorithms, our team successfully deployed the Trekomender website that enables users to make their decision of where to go much easier. The website not only recommends a destination but also gives a high-level description and highlights what are the most popular sights and activities in that destination. It also suggests what is the best time to visit. Imagine all of these useful information will be available to you once you share your preferences in traveling!!!