Personalized Hiking Suggestions
(An intelligent recommendation engine for finding similar hikes)

Introduction

AllTrails has the largest collection of trail guides. It has 75k+ trails information and more than 10 million active users. It gives users the ability to search for hikes via custom filtering of specific hiking trail attributes like distance, elevation gain and difficulty. But it doesn't have the intelligent recommendation engine based on the past experience.

In this project, I have built a web application that provides personalized hiking suggestions in California based on the past experience i.e if I liked hike X, I'll like to hike Y because it has similar hiking trail features.

Data collection

Scraping data was a challenging task. I did it in two phases. First I scraped the list of best trails in California from a hiking website. Then using this list I scraped the hike metadata like difficulty level, trail length, elevation gain, rating, route type and trail traffic information of each trail. I used selenium package for scraping. Since this is my first project that involved web scraping the scraped data ended up being messy. I had to do a lot of preprocessing to clean the data before building recommendation engine. For the analysis, I used most of the hike attributes as features.

Methodology

I used content based filtering for this recommendation system. I followed the below steps
- Start with a hike we know user likes
- Calculate similarity between this hike and all other hikes
- Recommend the ones that are most similar to the hike we started with
- I have also solved the cold start problem by recommending the most popular hikes

Implementation

The features of the trails considered to build the dataframe are:

```
featuresList = ['backpacking', 'bird watching', 'camping', 'cross country skiing', 'fishing', 'hiking',
                'horseback riding', 'mountain biking', 'nature trips', 'off road driving', 'paddle sports',
                'road biking', 'rock climbing', 'scenic driving', 'skiing', 'snowshoeing', 'surfing',
                'trail running', 'walking', 'beach', 'cave', 'city walk', 'forest', 'historic site',
                'hot springs', 'lake', 'rocky', 'rails trails', 'river', 'views', 'waterfall', 'wild flowers',
                'wildlife', 'dog friendly', 'kid friendly', 'partially paved', 'stroller friendly',
                'wheelchair friendly', 'no shade', 'snow', 'no dogs', 'dogs on leash', 'bugs', 'over grown',
                'scramble', 'washed out', 'blowdown', 'muddy', 'bridge out', 'paved', 'off trail', 'closed']
```

The data before cleaning:

	Name	Difficulty	Number of reviews	Location	Distance	Elevation Gain	Route Type	Features	Rating
0	Potato Chip Rock via Mt. Woodson Trail	HARD	2454	Lake Poway Park\n	7.6 miles	2,106 feet	Out & Back	dogs on leash, hiking, mountain biking, nature...	4.5
1	Vernal and Nevada Falls via the Mist Trail	HARD	1539	Yosemite National Park\n	6.4 miles	2,191 feet	Loop	hiking, nature trips, walking, bird watching, ...	4.8
2	Eaton Canyon Trail	MODERATE	1524	Eaton Canyon Natural Area Park\n	3.5 miles	436 feet	Out & Back	dogs on leash, kid friendly, hiking, trail run...	4.2
3	Alamere Falls via Coast Trail from Palomarin T...	MODERATE	1461	Point Reyes National Seashore\n	8.8 miles	1,335 feet	Out & Back	hiking, nature trips, bird watching, beach, fo...	4.7
4	Cowles Mountain Trail	MODERATE	1946	Mission Trails Regional Park\n	2.9 miles	912 feet	Out & Back	dogs on leash, kid friendly, hiking, mountain ...	4.2
5	Iron Mountain Trail	MODERATE	1533	Poway, California\n	5.2 miles	1,102 feet	Out & Back	dogs on leash, kid friendly, hiking, mountain ...	4.5

The data after cleaning:

	Name	Location	Difficulty	Number of reviews	Distance in miles	Elevation Gain in feet	Route Type	Rating	backpacking	bird watching	...	bugs	over grown	scramble	washed out	blowdown	muddy
0	Potato Chip Rock via Mt. Woodson Trail	Lake Poway Park	3	2454	7.6	2,106	1	4.5	0	0	...	0	0	0	0	0	0
1	Vernal and Nevada Falls via the Mist Trail	Yosemite National Park	3	1539	6.4	2,191	2	4.8	0	1	...	1	0	0	0	0	0
2	Eaton Canyon Trail	Eaton Canyon Natural Area Park	2	1524	3.5	436	1	4.2	0	0	...	0	1	1	1	0	0
	Alamere Falls via																

Deployment

The web application is deployed on azure - https://personalizedhikingsuggestions.azurewebsites.net/

Github link: https://github.com/smithaeshwarahalliramesh/Personalized-Hiking-Suggestions

Few screenshots of the web app: