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Content Based Hotel Recommendation System

Metis Bootcamp - NLP/ Unsupervised Learning Module

Andy Wang

Introduction

- Problem:
 - Spending time researching for another hotel if the hotel of interest is completely booked
- Goal:
 - A hotel recommendation system that provides top five hotels similar in star rating and attractions around the hotel of interest



Methodology

995 hotel
star ratings /
area
descriptions



Beautiful Soup
Selenium

Chicago
San Francisco
New York City
Seattle
Los Angeles

Pandas
NLTK
Regex

TfidfVectorizer

SVD
NMF

Cosine similarity

Results are evaluated subjectively by comparing star ratings & area descriptions

Topics with truncated SVD

<i>Topic 1</i>	<i>Topic 2</i>	<i>Topic 3</i>	<i>Topic 4</i>	<i>Topic 5</i>
new_york	san_francisco	chicago	seattle	los_angeles
st	oracle_park	pavilion	lumen_field	staples
san_francisco	historical	uic	lake	museum
mid	pier	wrigley	union	santa_monica_pier
square	ferry	solder_field	climate_pledge_arena	venice
times	muir	seattle	el_corazon	la
madison_square_garden	monument	field	pike_place_market	pantage_theatre
st_james_theatre	woods	navy_pier	tmobile_park	belasco
park	exploratorium	tower	wheel	wax
ing	chase	the_loop	westlake	paramount_studios

Recommendation



Oakwood at Via 6

3 stars

Hyatt Place Seattle
Downtown

3 stars

Quality Inn & Suites Seattle
Center Downtown

3 stars

Staypineapple, Hotel
Downtown Seattle

3 stars

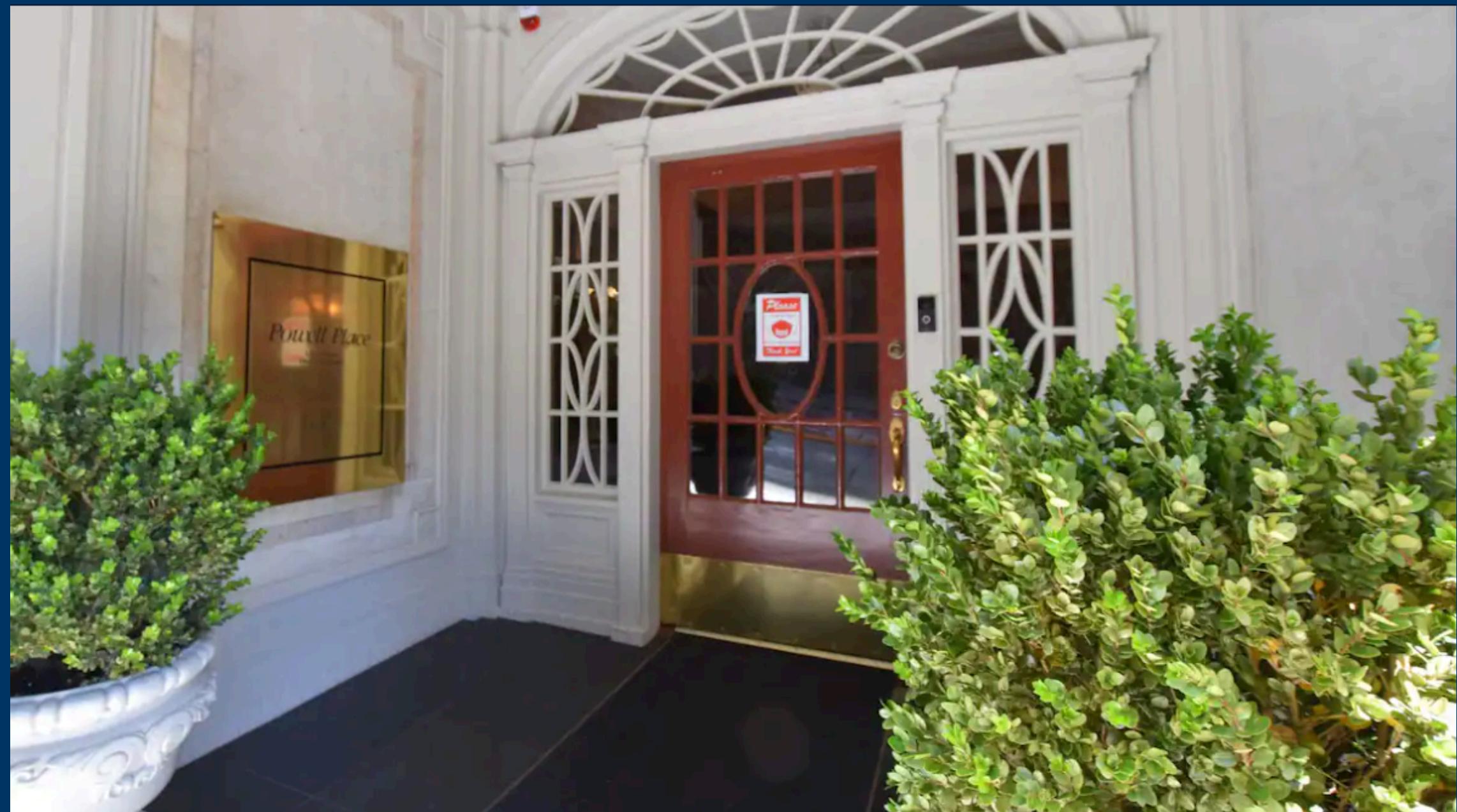
Hilton Seattle

3 stars

Holiday Inn Seattle
Downtown

3 stars

Recommendation



Powell Place

2 stars

Inn at Union Square

3 stars

The Ritz-Carlton, San Francisco

5 stars

Courtyard by Marriott San Francisco Union Square

3 stars

Union Square Plaza Hotel

2 stars

Le Meridien San Francisco

4 stars



System with truncated SVD provides extreme results - either all five excellent recommendations or all are completely wrong

Topics with NMF

Topic 1	Topic 2	Topic 3	Topic 4	Topic 5
st	san	chicago	los	seattle
square	francisco	field	angeles	waterfront
new	national	beach	hollywood	lumen
york	downtown	north	studios	center
station	oracle	water	center	lake
midtown	park	near	museum	union
minutes	historical	michigan	monica	climate
madison	maritime	loop	santa	pledge
central	great	pavilion	staples	place
park	ferry	soldier	beach	looking

Recommendation



Pendry Chicago

4 stars

Omni Chicago Suites -
Magnificent Mile



4 stars

Swissotel - Chicago



4 stars

Virgin Hotels Chicago



4 stars

Hyatt Centric Chicago
Magnificent Mile



4 stars

The Peninsula Chicago



5 stars

System with NMF provides mixed results - some recommendations are great, some are ok, and some are completely wrong

Conclusion / Future Work

- Recommendation system with NMF provides better results than that of truncated SVD
- Build a collaborative recommendation system

Thank you