



# WHAT MAKES A HOTEL REVIEW HELPFUL?



FARHAN SYED



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# DATA



# WEBSRAPING



# DATA

tripadvisor®

colab

repl.it



WEBSRAPING

PARALLELIZATION

REVIEWS FROM  
MULTIPLE HOTELS



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WEBSRAPING



PARALLELIZATION

REVIEWS FROM  
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mongoDB

DATABASE



# MODELING

## STOP WORDS

NLTK

SPACY

## OTHER TEXT PRE-PROCESSING

REMOVE UNHELPFUL CHARACTERS

REMOVE PUNCTUATION

REMOVE HOTEL NAME

REMOVE NON-ENGLISH CHARACTERS

REMOVE NUMBERS

STEMMING



# SELECTED MODEL

## VECTORIZER

TERM FREQUENCY–INVERSE DOCUMENT FREQUENCY

ngram\_range=(2, 3)  
min\_df=0.01

## TOPIC MODELING

NON-NEGATIVE MATRIX FACTORIZATION

4 Topics  
Top 9 words per topic



# TOPICS

whistler village,  
free shuttle, view  
lake, shuttle  
service, place stay,  
stay whistler,  
highly recommend,  
stay night, shuttle  
whistler

staff friendly, friendly  
helpful, staff friendly  
helpful, highly  
recommend, helpful  
staff, room clean,  
friendly room, shuttle  
driver, stay staff

lake view, view room,  
lake view room, view  
suite, lake view suite,  
room lake, stay lake,  
room lake view, room  
spacious

hot tub, outdoor hot,  
outdoor hot tub,  
bedroom suite, pool  
hot, pool hot tub,  
steam room, soaker  
tub, room spacious



# TOPICS

whistler village,  
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## EXPERIENCE & AMENITIES

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## CUSTOMER SERVICE

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## VIEW OF NITA LAKE

hot tub, outdoor hot,  
outdoor hot tub,  
bedroom suite, pool  
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## VIEW OF NITA LAKE

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## LUXURY/SPA FEATURES



# PREDICTING REVIEW HELPFULNESS

ORIGINAL BAG OF WORDS:

2145 ROWS X 315 COLUMNS

WITH TOPIC MODELING:

2145 ROWS X 4 COLUMNS

LINEAR REGRESSION, RANDOM FOREST REGRESSOR

0.51 - VIEW OF NITA LAKE

0.22 - EXPERIENCE & AMENITIES

0.15 - CUSTOMER SERVICE

0.10 - LUXURY/SPA FEATURES

FEATURE IMPORTANCE:



## BUSINESS VALUE

- Suggest topics for users to make reviews helpful
- Inform hotel about features that guests value



## FUTURE WORK

- Topic Modeling for reviews across different hotels
- Clustering to identify different types of guests
  - Couples, Business Travelers, Families



QUESTIONS?  
THANK YOU

