Natural Language Processing - Practical Case

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Disclaimer

- All materials provided here reflect my own views and not those of my employer.
- Please, do not take my opinions too seriously as I tend to be wrong more times than expected (on average) every single day.

https://github.com/frabanalpresa/mbds

Practical case: Amazon Fine Food reviews

Image from D. Chen analysis

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- CC0: Public Domain License
- J. McAuley and Jure Leskovec, From amateurs to connoisseurs: modeling the evolution of user expertise through online reviews, 2013

Data sources

http://snap.stanford.edu/data/web-FineFoods.html
https://www.kaggle.com/snap/amazon-fine-food-reviews

- Kernels
- Discussions
- Visualizations

Dataset information

Number of reviews	568,454
Number of users	256,059
Number of products	74,258
Users with >50 reviews	260
Median words per review	56
Timespan	Oct '99 - Oct '12

Other information

> From amateurs to connoisseurs: modeling the evolution of user expertise through online reviews

J. McAuley and Jure Leskovec, 2013

Different problems can be solved:

- Sentiment analysis
- Regression over ratings
- Generate synthetic reviews
- Categorize users
- Clusterize products
- Acquire knowledge about a domain

Proposal

- Have some knowledge about real-world NLP problems.
- Solve a NLP question with real data.
- Apply a NLP algorithm in R/Python to solve a problem.
- Have fun!

Introduction

- Retain only 'Text' field in each sample.
- Explore some of the reviews in the dataset visually (5-10)

Example #1

```
# Reveived my item fast! It was exactly what I ordered
# in excellent shape with safe shipping - i will came
# back and shop here again.  Thanks
```

Example #2

```
# I tasted this Matcha from Rishi the first time today.
# The flavor is bright, assertive and fresh...
```

Example #3

```
# When I was young, nearly a half century ago, Chuckles
# was a very popular candy. I really enjoyed eating
# these jellied treats...
```

Text preprocessing

```
text = ''
text = text.lower()
```

- Load sentence/text/document
- Lowercase characters

```
import string

text = \
  text.translate(str.maketrans('','',
                               string.punctuation))
```

- Remove punctuation

```
from nltk.corpus import stopwords

text = [word for word in text.split()
        if word not in stopwords.words('english')]
text = ' '.join(text)
```

- Remove stopwords
- Form a full sentence

Example #1

```
# Reveived my item fast! It was exactly what I ordered
# in excellent shape with safe shipping - i will came
# back and shop here again.  Thanks
```

```
# reveived item fast exactly ordered
# excellent shape safe shipping came back shop thanks
```

Example #2

```
# I tasted this Matcha from Rishi the first time today.
# The flavor is bright, assertive and fresh...
```

```
# tasted matcha rishi first time today flavor
# bright assertive fresh
```

Example #3

```
# When I was young, nearly a half century ago, Chuckles
# was a very popular candy. I really enjoyed eating
# these jellied treats...
```

```
# young nearly half century ago chuckles popular
# candy really enjoyed eating jellied treats
```

For starters...

Display some statistics about the text, once it has been cleaned:

Top Count Words Used In Review

br	22349	flavor	7819	product	6976	tri	6052
like	10099	coffe	7376	one	6511		
tast	9321	good	7301	love	6311		

Kaggle, 2017

Choose a problem

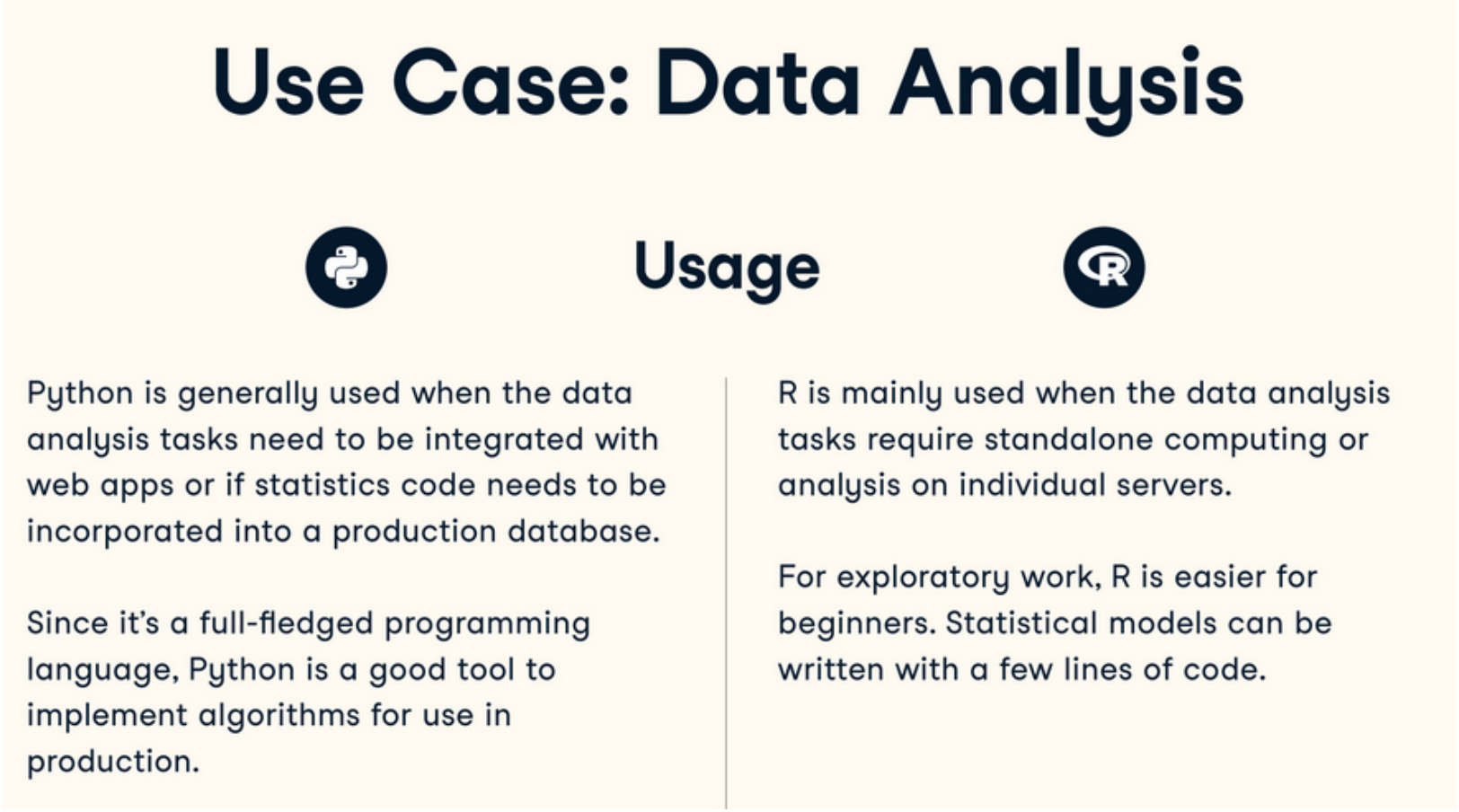
Classic NLP problems:

- Clustering: k-means, hierarchical...
- Topic modeling: LSI, LDA...

Other problems that could be solved:

- Word similarity: GLoVe, word2vec...
- Generate reviews: LSTM, GAN
- Summarize reviews
- Clusterize users
- Rating prediction
- Popularity prediction
- ...

Choose an environment



DataCamp analysis for R vs Python.

R

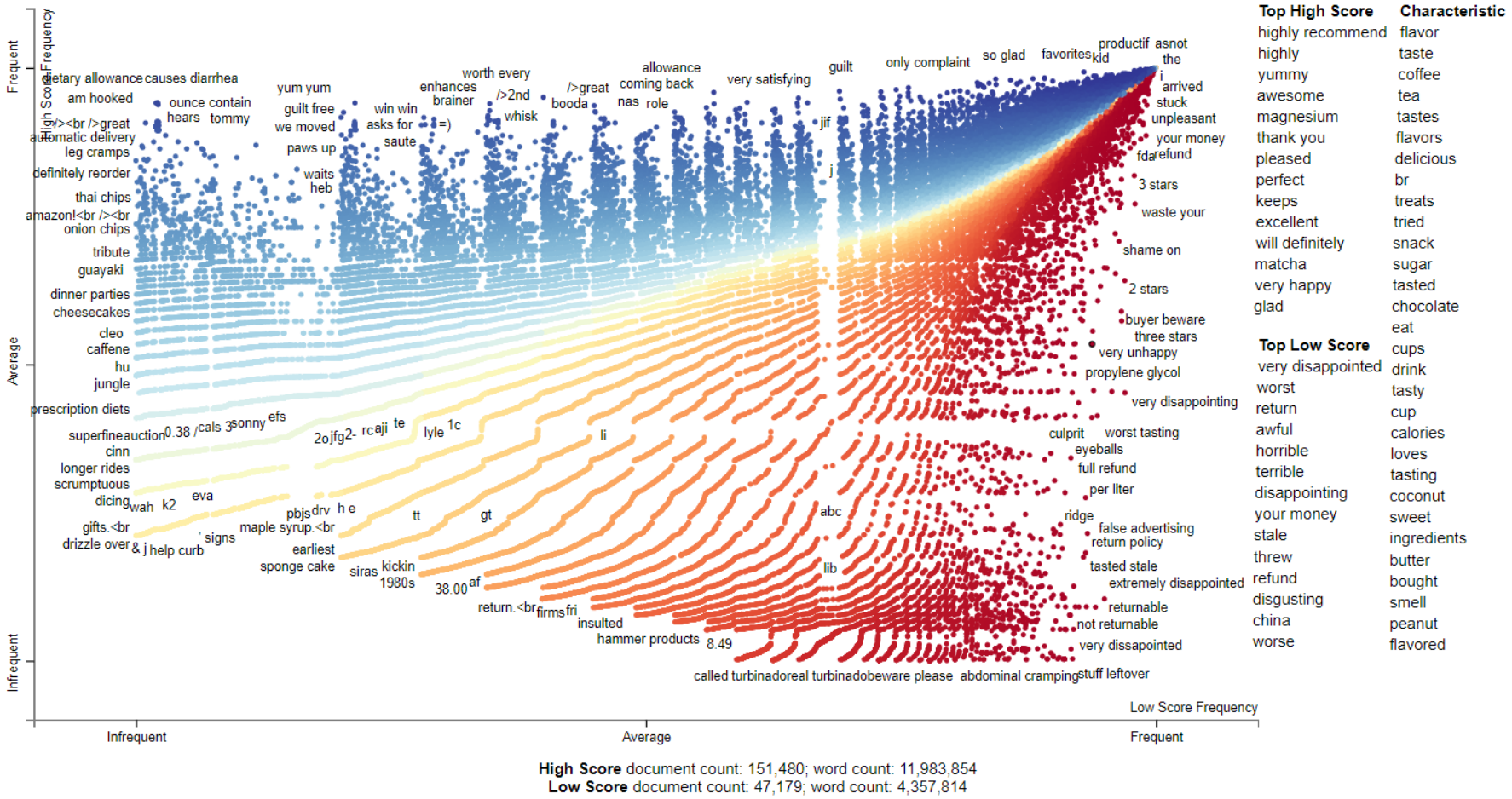
Formats	Packages
R scripts	tm
RMarkdown	tidytext
R Notebook	

Python

Formats	Packages
Scripts	NLTK, gensim
Jupyter Notebook	scikit-learn
Python module	pandas

Have fun!

Kaggle home page for dataset, SNAP group, 2016.



High Score document count: 151,480; word count: 11,983,854
Low Score document count: 47,179; word count: 4,357,814

An interesting analysis by Daniel Chen

Additional challenges

- Yelp Dataset, also in Kaggle Datasets.
- Open Food Facts, also in Kaggle Datasets.