# An NLP Analysis on the Reviews from De Kas Restaurant Amsterdam

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IronHack

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# Project description

- Understand the customers’ feedback and know what are the strengths and weaknesses from the business from their eyes.
- Use NLP to extract quick and valuable insights from the customers’ reviews

## Goals

### 1

**Which features are more valuable for the costumers.**

### 2

**Which areas improve to deliver a better experience for the costumers.**

### 3

**Establish a model to determine whether a review is positive or negative, and which features are important on the decision.**

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# Context

- Sustainable restaurant
- 2001
- Michelin star
- Located in a park, in a greenhouse.
- They have gardens in Amsterdam and the Beemster.
- Fresh own products drown in open air, greenhouse and hydroponically.
- Local farmers
- Seasonal food

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# Workflow

## Getting the data

- Trip advisor Web Scraping - Selenium
- 1038 reviews
- Features:
  - Id
  - Date
  - Header
  - Score
  - Review

## Cleaning data

Clean text for NLP methods:

- remove special characters
- remove extra spaces
- remove digits
- remove urls's
- convert to lower case

## Pre-processing

- Create a corpus
- Tokenization
- Lemmatization
- Remove non-meaningful words

- Classify reviews in:
  - positive reviews > 3
  - negative reviews < 3

- Down & up sampling

## Words Analysis

- Words frecuency
- TF-IDF ( Term Frequency-Inverse Dense Frequency) / ngrams (2,3)

## Models

- Classification models

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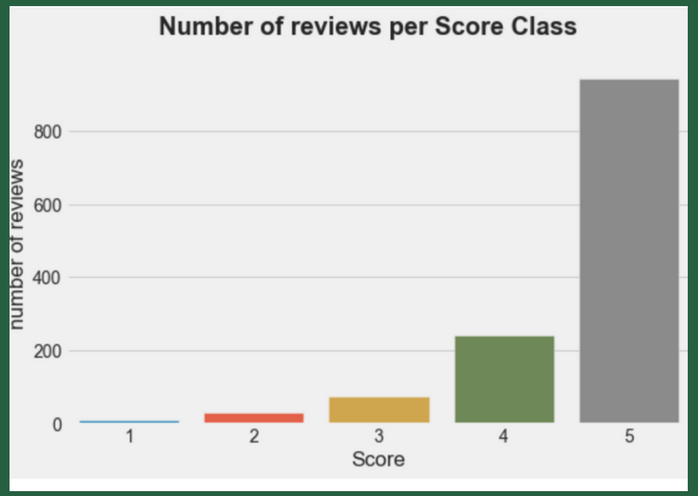
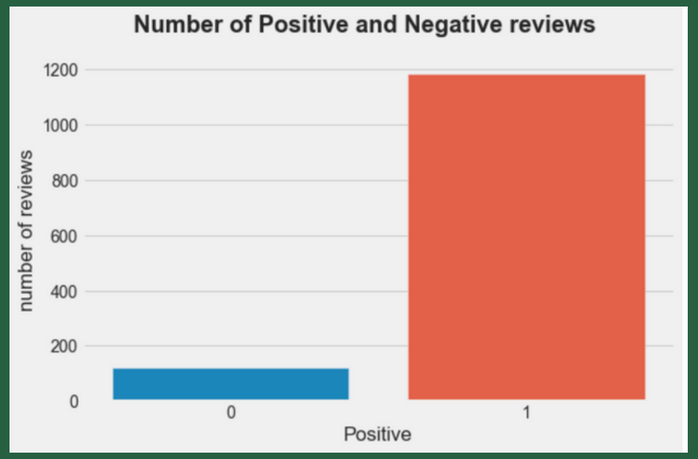
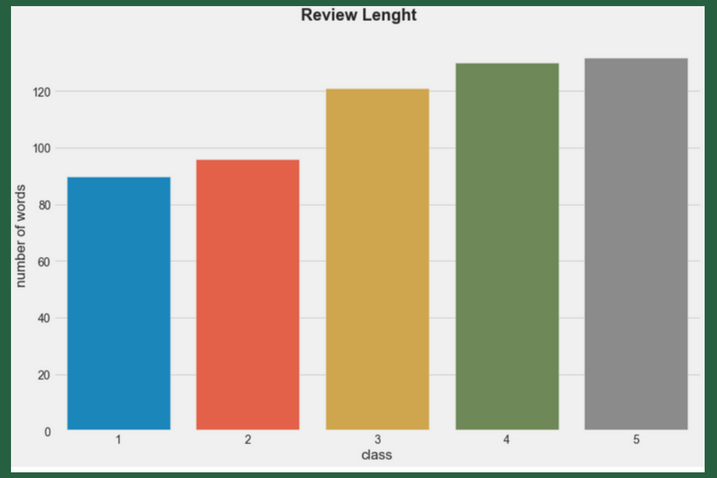
# Exploratory Analysis

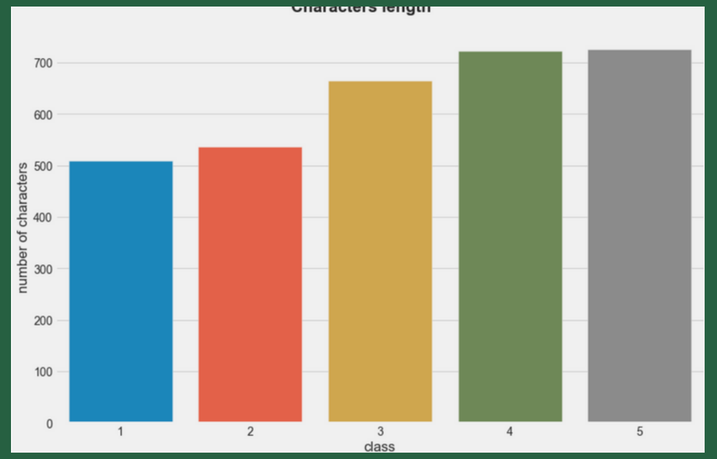
## How many reviews per score class?




## Calculated metrics:



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# Bag of words


Positive

Negative

## TF-IDF ( Term Frequency- Inverse Dense Frequency) / ngrams )

By evaluating TF-IDF:  number of “the words used in a sentence vs words used in overall document”, common theme in all the documents (*sort by tif-idf score/weight)/20 features/2g-3g

### Negative

**appetizer tasteless**
fresh ingredient
three course
left hungry
**guinea fowl**
bread tasty
three starter
dining experience
**fish** bland
**course soup**
bad service
course fish
**high expectation**
paid euro
bottle wine
first course
set menu
main course

**pork** chorizo samphire
pork veal preferred
**portion extremely tiny**
poor experience want
**poor selection cheese**
portion extremely small
pork main accompanied
pork medallion special
pork rib small
**salad** main course
choice first course
**euro per person**
main course tiny
looking forward dinner
first course soup
waiter wearing mask

### Neutral

**brussel sprout**
paid euro
vegetable dish
small plate
**small piece**
six course
service good
nothing special
lovely setting
ice cream
fresh vegetable
small portion
wine pairing
**set menu**
green house
tasting menu
course menu
first course
main course

**potato** crisp brought
possibly best thing
take long time
potential management act
**potatoe brocolli flowe**r
potato thought unusual
**potato nothing extraodinary**
good great wait
menu per person
main course **chicken**
**lamb** main course
**hour main course**
review guide book
serf **daily** menu
six course tasting
greenhouse middle park

### Positive

**service good**
best meal
excellent service
**vegetable grown**
grown site
next time
highly recommended
course meal
**service excellent**
**staff friendly**
**tasting menu**
fixed menu
**wine list**
well worth
dining experience
**green house**
main course
highly recommend
**wine pairing**
**set menu**

greenhouse middle park
**easy tram ride**
**vegetable grown site**
set menu course
good wine list
euro per person
**wine pairing menu**
book well advance
best meal ever
best dining experience
home grown vegetable
service attentive friendly
made feel welcome
staff friendly helpful
course wine pairing
back next time
well worth trip

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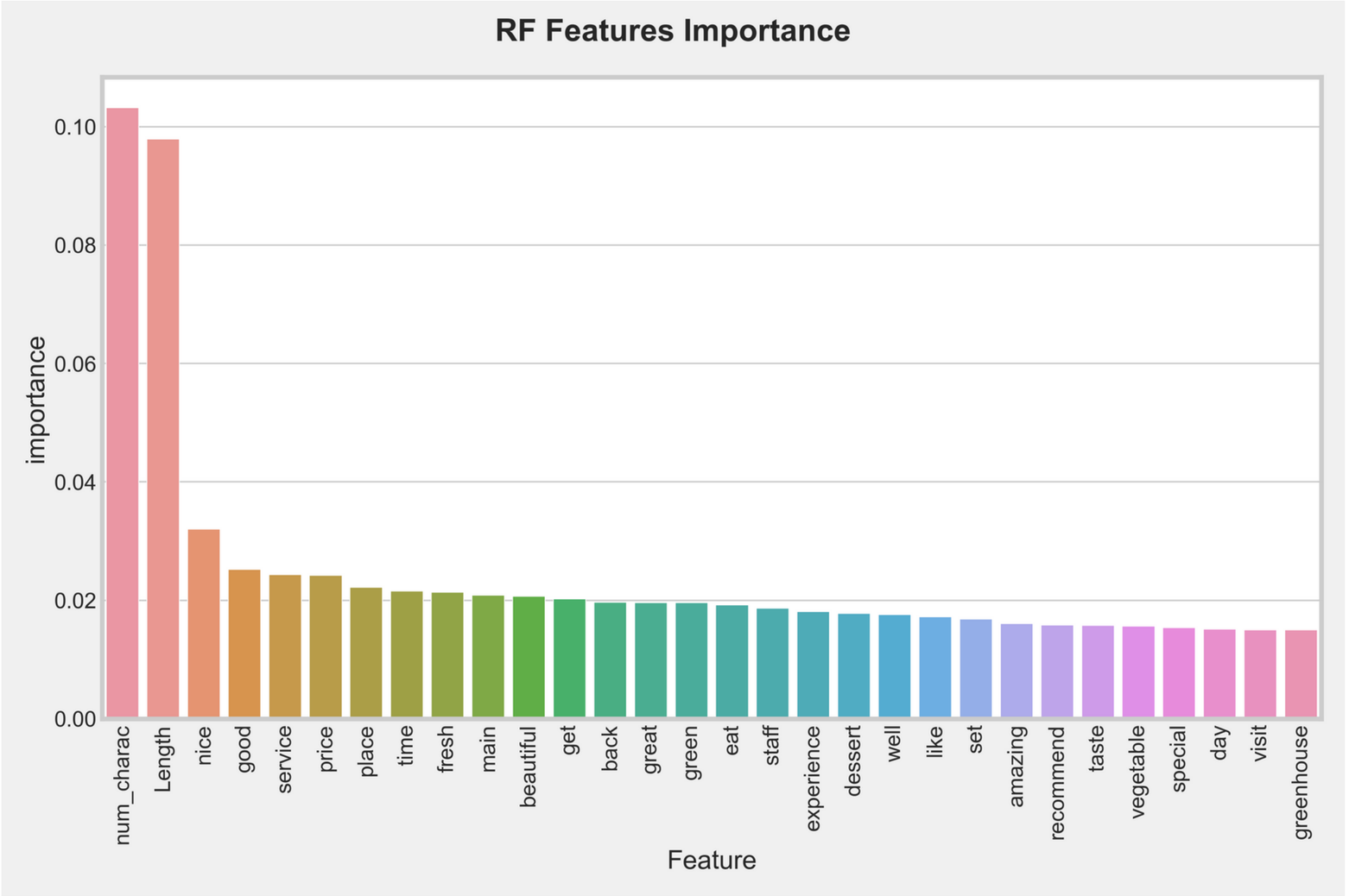
# Modeling

But training a model to predict this rating will help us find which words (features) are key for customers.

- Down & up sampling (train set)
- Dummify set of words
- Models (balanced, unbalanced, 5 categories, 2 categories, 1-2-3 g,

  - Random Forest (extraction features)
  - Logistic Regression (RobustScaler)

- Bad predictions, with really low kappa values
- Predicts better the majority class



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# Conclusions and recommendations

- Highly valued by clients: service, location, building, own garden, wine pairing, set menu

- Rethink the use of meat and dairy, portioning, appetizers, starters (cheeses, soup, salads) and the way to use basic ingredients like potatoes and cabbage family vegetables.

- Not good predictions of the models, predicts better the majority class.

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# Future Improvements

- Get more reviews from other sites like Yelp, google and local ones.
- Use more complex models and NN
- Time Series Analysis
- Themes Impact Analalysis
- NLP on the Reviews Title
- Embeding methods: represent reviews as vectors representation to be able to apply clustering algorithms to detect topic and other methods like Word2Vec Architecture Implementation (word representations in Vector Space )
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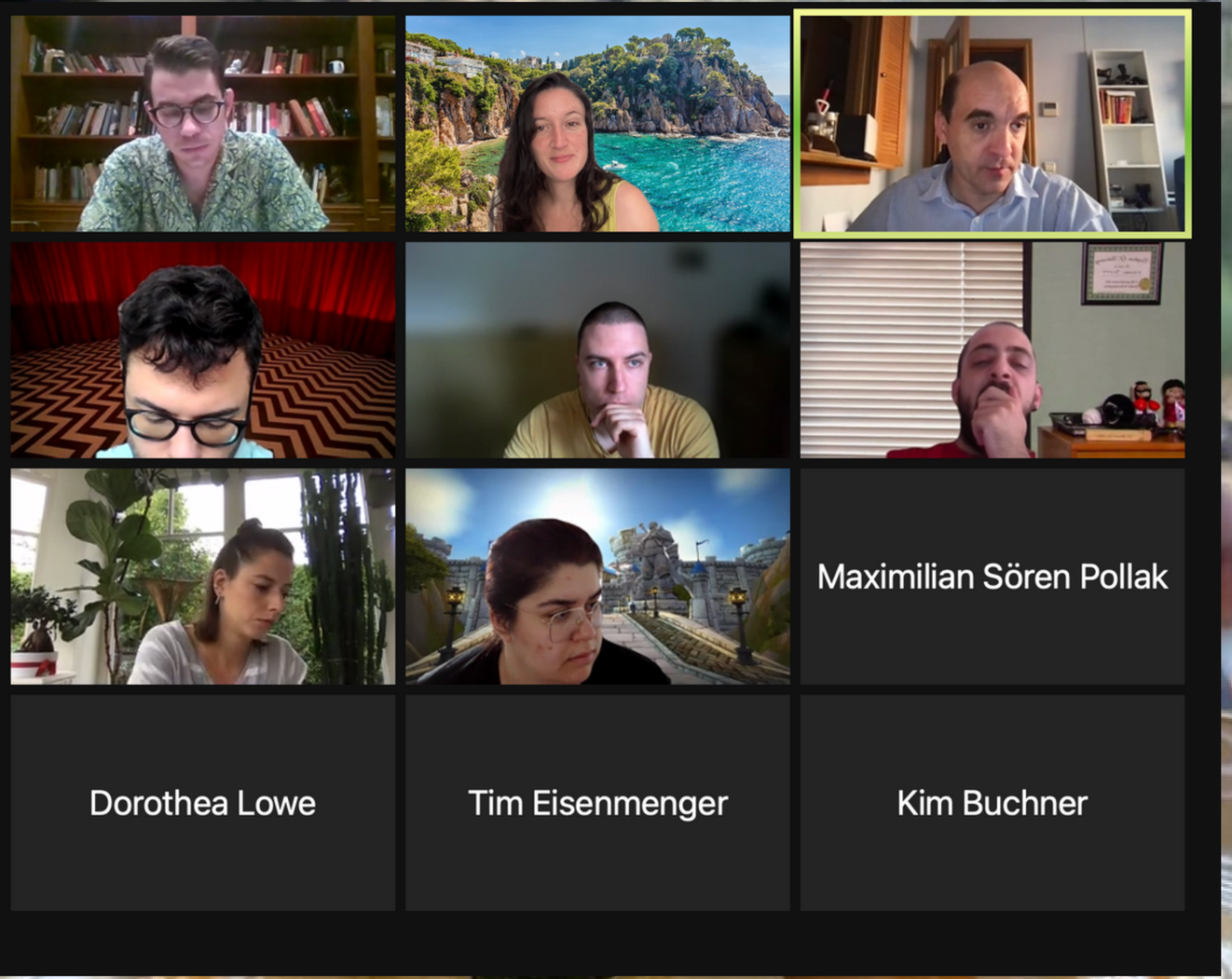
# Thank you!




Questions?

or it is too early?