# Sentiment Analysis of customer reviews

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# What is sentiment analysis?

- Technique for detecting opinions in textual data sources
- Classifies text as positive or negative
- Used by organisations to analyse customer relationships

# Naïve Bayes Classifier

Classification method based on the Bayes Theorem:

$$P(A|B) = \frac{P(B|A)P(A)}{P(B)}$$

Is Naïve Bayes a useful method for analysing customer reviews?

# The data sources

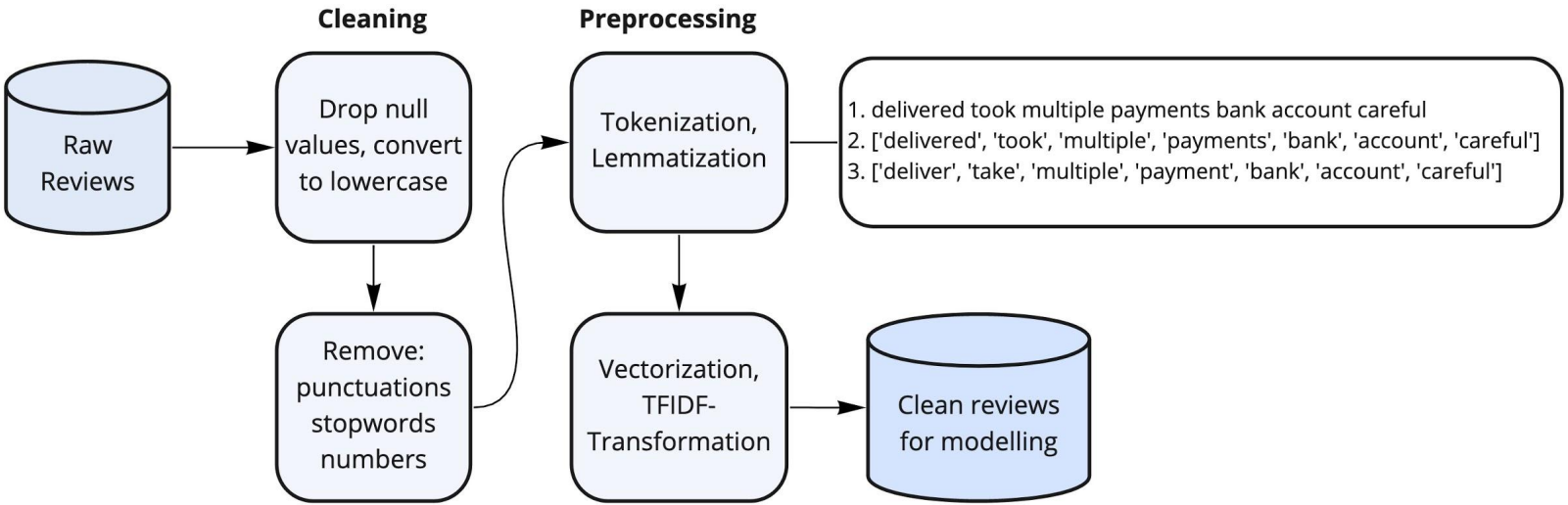
**Kaggle**

- 23,000 reviews
- Women’s clothing
- Binary classification

**Trustpilot**

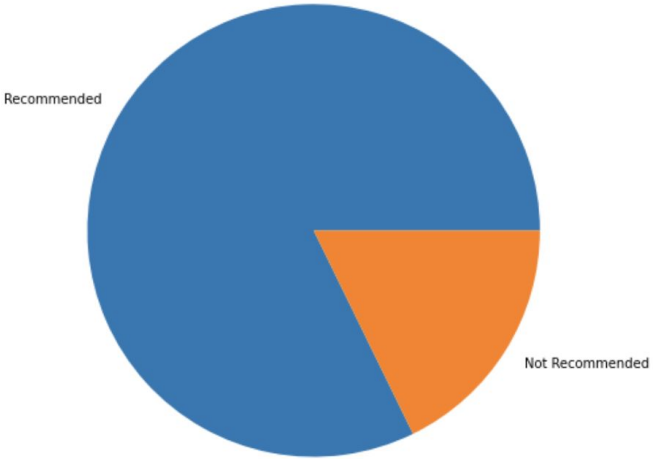
- 48,000 reviews
- Fashion eCommerce
- Multiclass classification

# Preparing the data for modelling

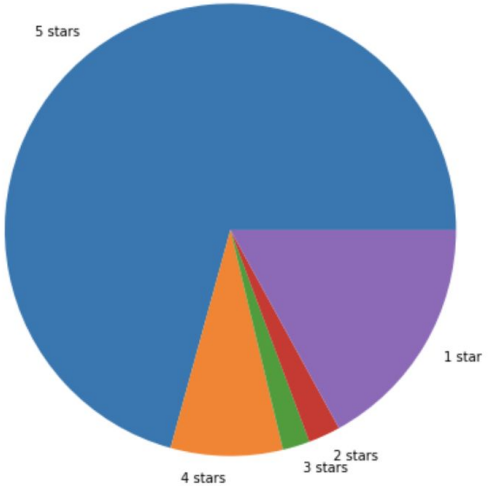


# The target variables

Binary classifier



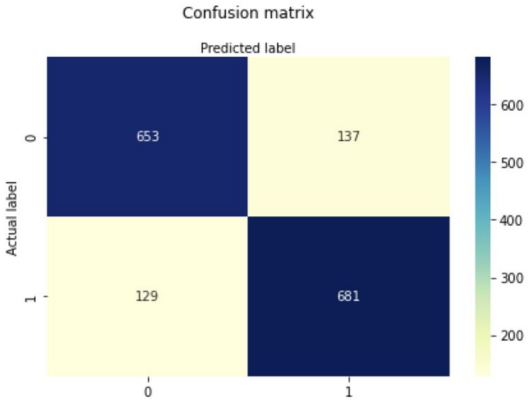

Multiclass classifier



# Model evaluation

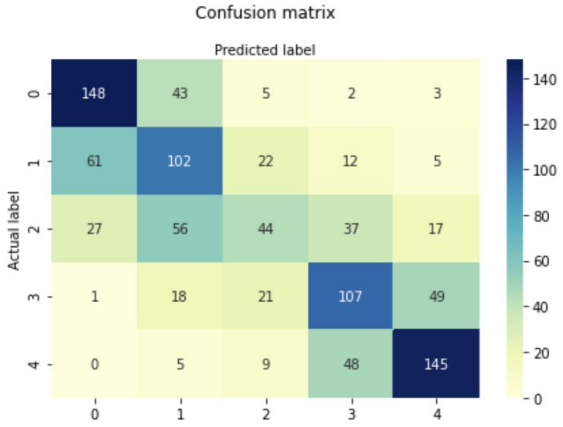
## Binary classifier

**`Model accuracy: 0.86`**




## Multiclass classifier

**`Model accuracy: 0.52`**

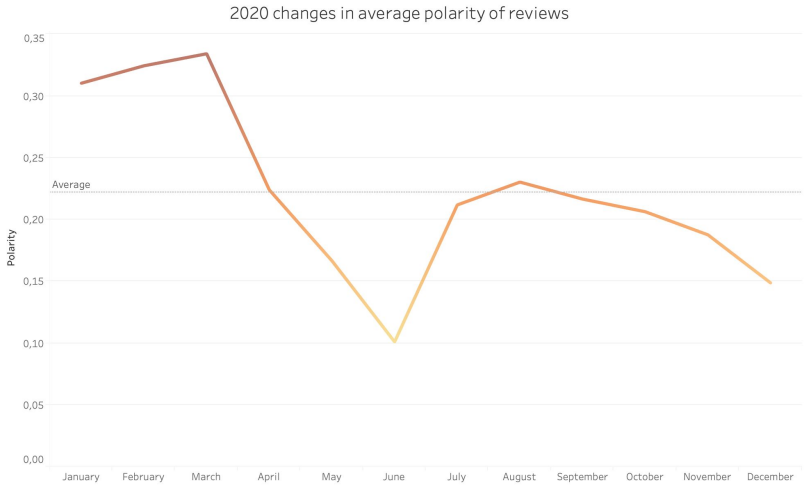


# Model evaluation

| Binary classifier | Accuracy |
|---|---|
| **Naïve Bayes** | 0.86 |
| **Logistic Regression** | 0.86 |
| **Random Forest** | 0.74 |
| **Decision Tree** | 0.84 |
| **Support Vector Machines** | 0.86 |

| Multiclass classifier | Accuracy |
|---|---|
| **Naïve Bayes** | 0.52 |
| **Logistic Regression** | 0.54 |
| **Random Forest** | 0.39 |
| **Decision Tree** | 0.49 |
| **Support Vector Machines** | 0.53 |

# Textblob analysis




# Learning outcomes and future focus

- Naïve Bayes is maybe not that useful method for analysing customer reviews
- A lexicon-based approach can give more valuable insights
- Future outlook: handling of imbalanced samples and improving my modelling

# Thank you!

**Code references**


https://ryan-cranfill.github.io/sentiment-pipeline-sklearn-2/
https://www.kaggle.com/granjithkumar/nlp-with-women-clothing-reviews
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https://towardsdatascience.com/nlp-for-beginners-cleaning-preprocessing-text-data-ae8e306bef0f
https://www.kaggle.com/shirellamosi/sentiment-analysis-nlp
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