GA DSI 26 Project 3: Wine and Beer

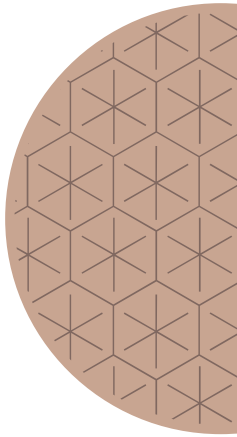
By: Lim Zhi Yong

Task:

- Understand consumer patterns
- Identify if the consumer wants winemaking or homebrewing info
- Train model with subreddit posts

Data Description

- 1,000 posts from each subreddit
  - r/winemaking
  - r/homebrewing
- Cleaned punctuation, stopwords, delimiters
- Considered both unigrams and bigrams



Sociolinguistic Insights

Let's first look at the sociolinguistic insights from the best model:

- "Wine" was top classified word for winemaking, but second in misclassified posts
- Classes had the usual suspects: hop', 'malt', and 'keg' for beer, 'grape', 'skin', and 'age' for wine
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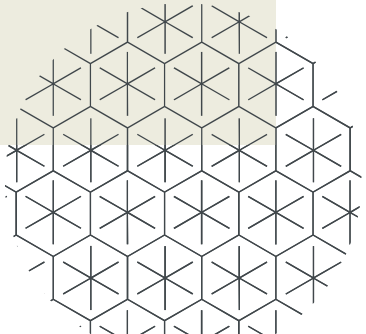


Notes

“wine”

“Wine” was top classified word for winemaking, but second in misclassified posts

Usual suspects

- hop', 'malt', and 'keg' for beer
- 'grape', 'skin', 'age' for wine

Overlapping words

- Sugar
- Yeast
- Ferment

Seeking advice

'first time' comes up relatively frequently

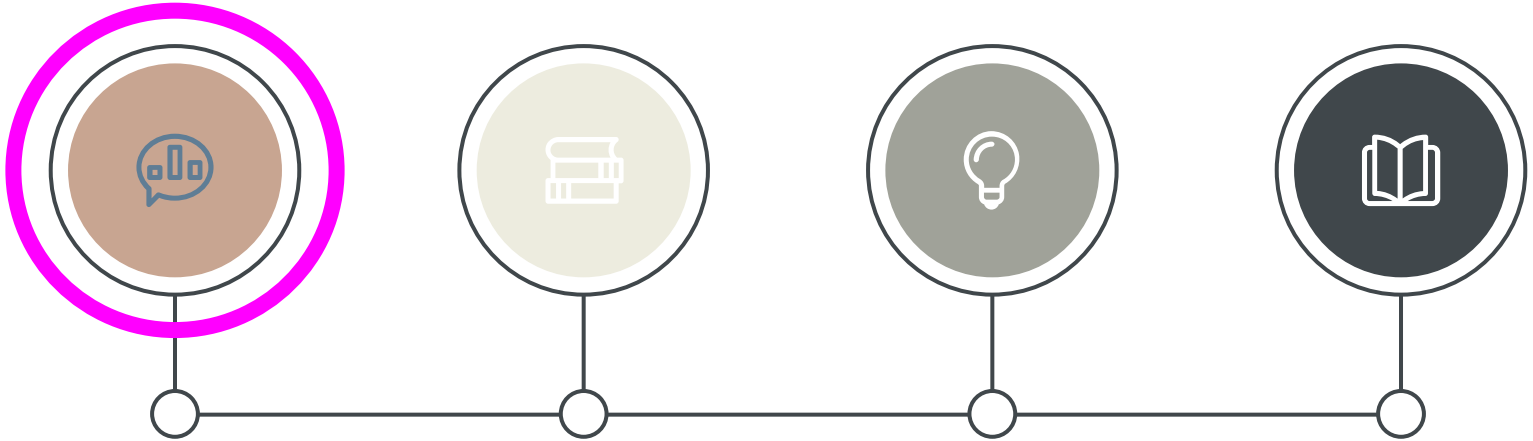
Types

Wine has more types (strawberry, elderberry, banana) than beer (pale ale, ginger) in top 20

Tokenize

Bigrams had more unique tokens than unigrams

Model Workflow



Data Cleaning

- Missing values
- Vectorization

Modelling

- Building models

Testing

- Scoring models

Recommendations

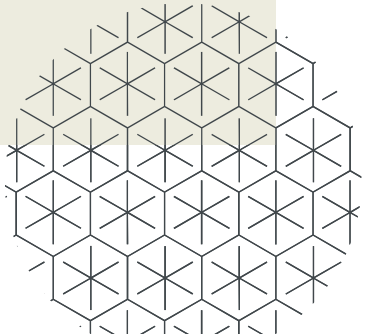
- Important features

Missing Values

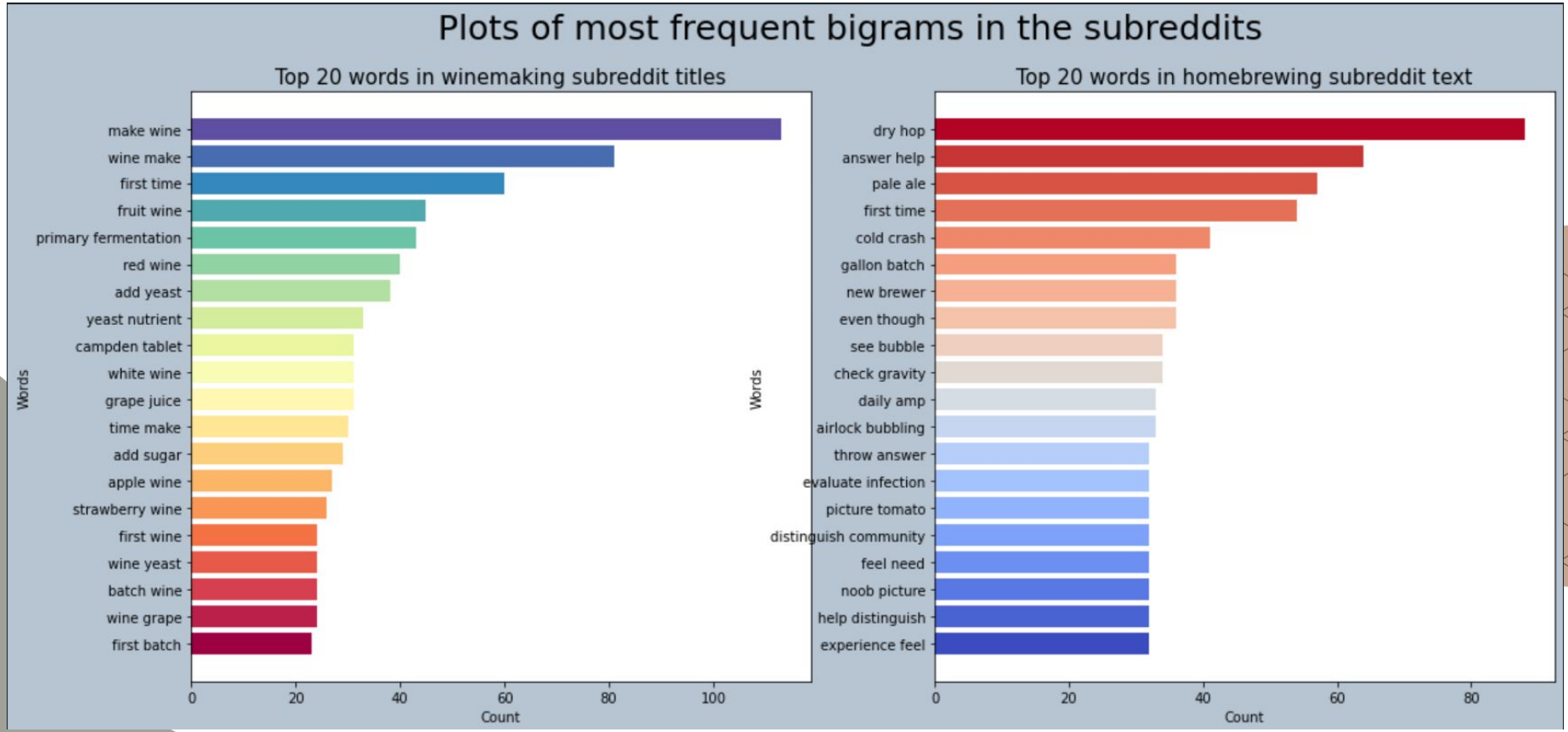
There are different types of missing values:

- Duplicate posts were removed
- Null and removed texts were replaced with the empty string
- One deleted post was miscategorized, we removed it

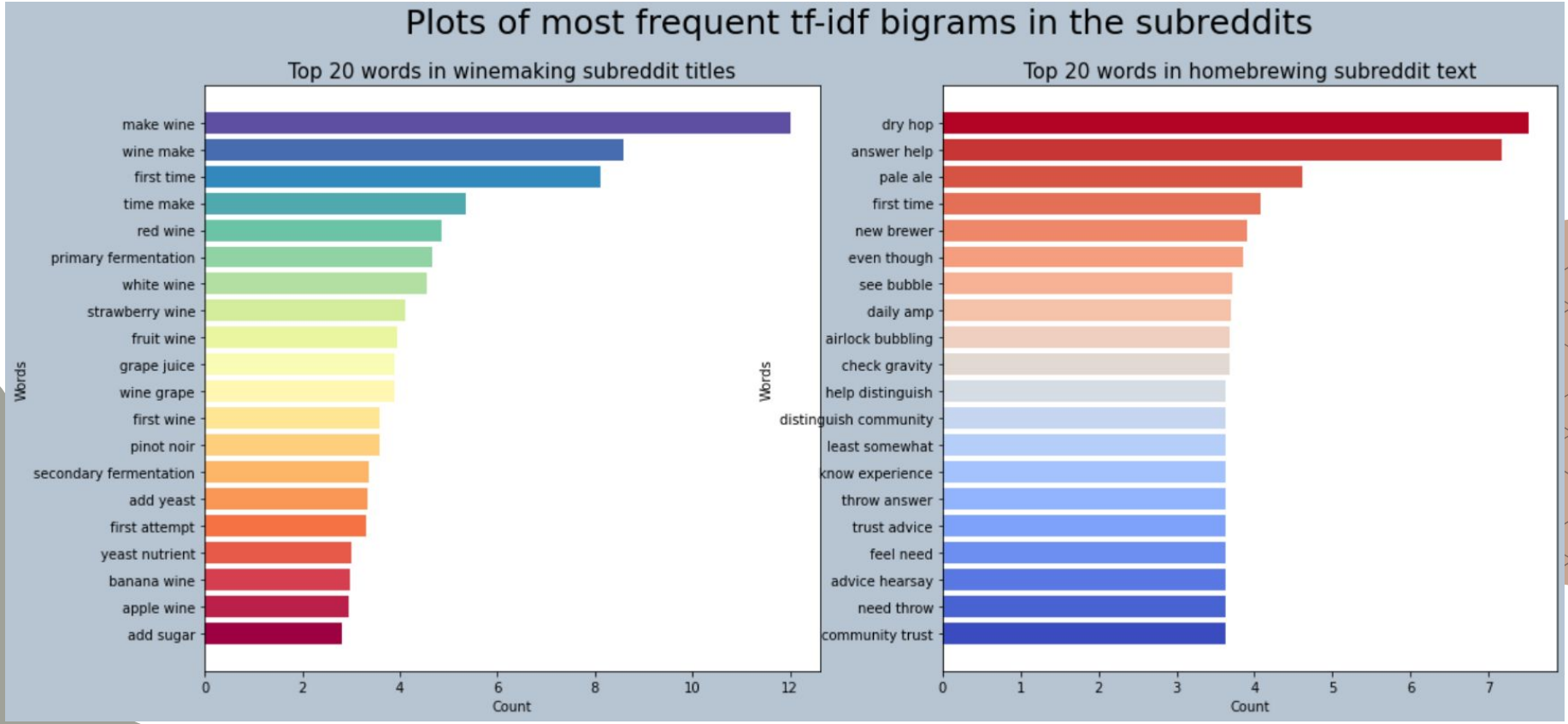
1969 rows left



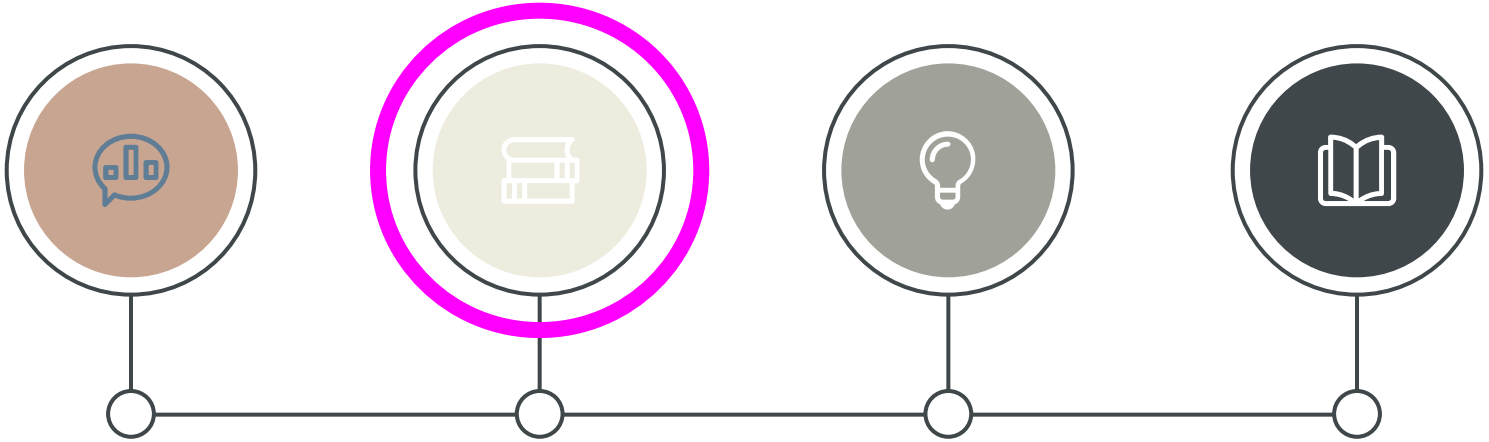
Plots of most frequent bigrams in the subreddits



Plots of most frequent tf-idf bigrams in the subreddits



Model Workflow



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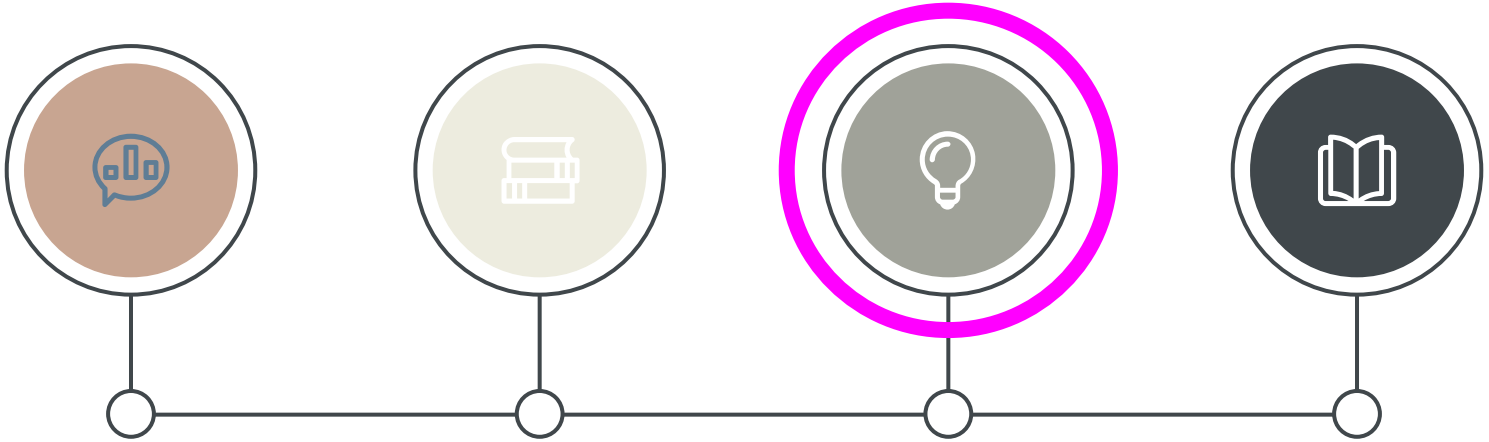
Modelling

- 8 models:
  - Logistic regression
    - Count
    - Tf-idf
  - KNN classifier
    - Count
    - Tf-idf
  - Naïve bayes
    - Count
    - Tf-idf
  - Random forest
    - Count
    - Tf-idf

Scoring

- ROC-AUC to determine best models
- F1 score to compare baseline score
- Accuracy to determine whether overfit

Model Workflow



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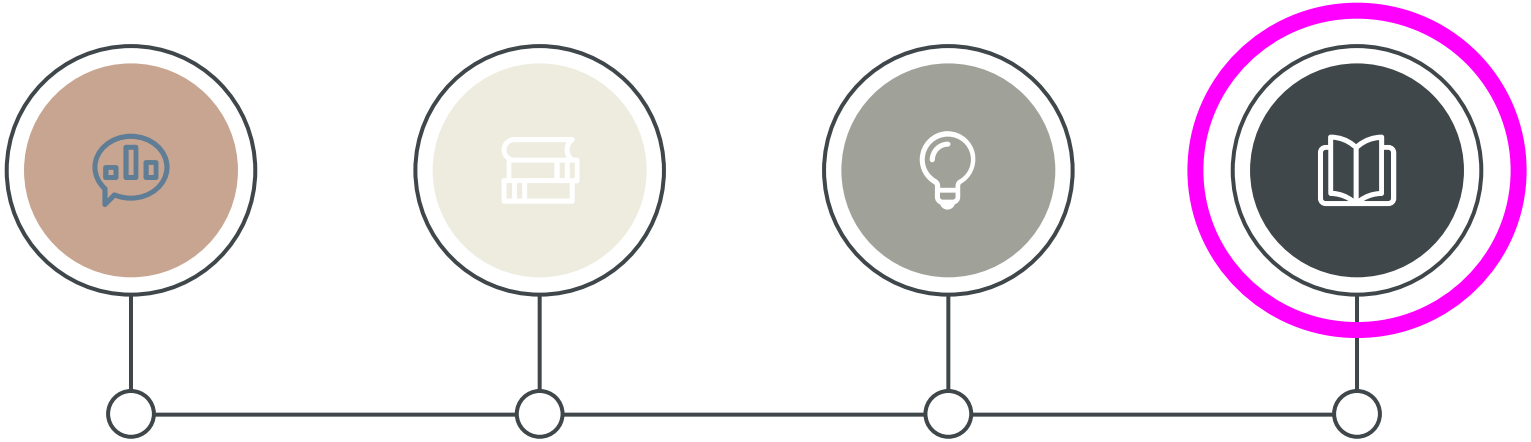
Logistic Regression performed the best

models	vectorizer	accuracy score	auc score
Logistic Regression	count	0.897	0.961
Logistic Regression	tf-idf	0.917	0.975
KNN Classifier	count	0.720	0.851
KNN Classifier	tf-idf	0.580	0.655
Naïve Bayes	count	0.789	0.925
Naïve Bayes	tf-idf	0.789	0.925
Random Forest	count	0.890	0.964
Random Forest	tf-idf	0.888	0.966

0.97 ROC-AUC
0.92 accuracy

Model Workflow



Data Cleaning

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Best Model

Features

- Wordnet lemmatizer
- Tf-idf vectorizer
- Logistic regression with ridge penalty

Limitations

- Spell check before lemmatizing
- Slightly overfit, could remove more stopwords

Thanks

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