



Scotch Whisky Recommender

*A 'Neat' Approach
Using NLP*



Hello!

I'm Shannon McDonnell

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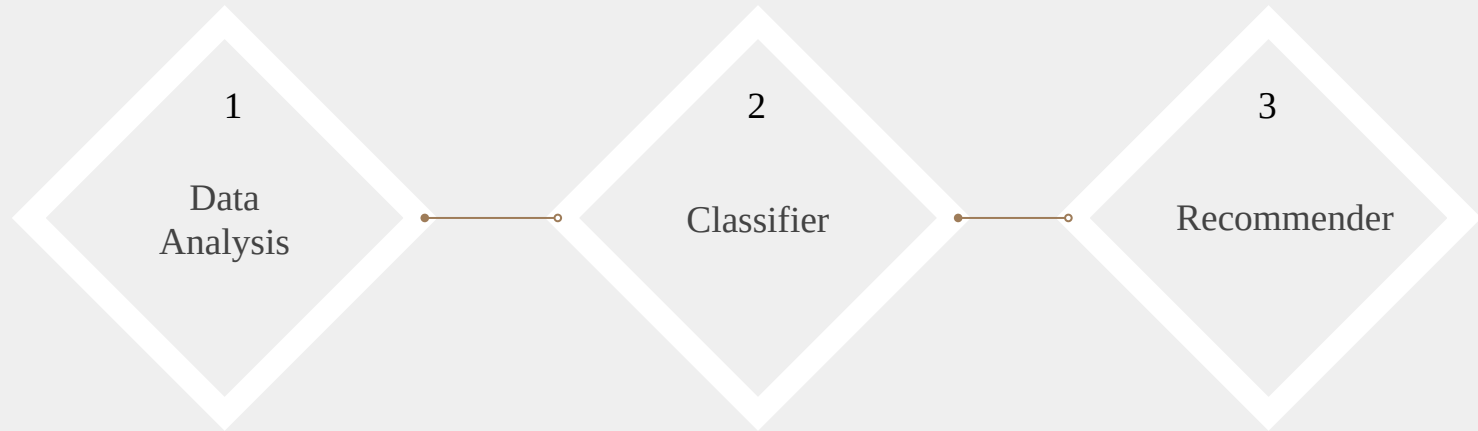


Goals & Objectives



*The purpose of this project is to
explore the flavors, notes and
finishes of bottles of Scotch by
analyzing text reviews with NLP*

Project Workflow: 3 Separate Parts



1

Data
Analysis

EDA



Text: *Review Descriptions*

- ◆ Word frequencies
- ◆ Text preprocessing
 - ◇ Removing useless words:
 - ◇ Bottle, casket, notes, palate, mouth
- ◆ Looking for trends or nuances

A **TEXT** sample of a review description



“It is deep, dark, and quite powerful with a hefty malt foundation and sweeter **notes** of toffee and vanilla combined with resinous oak, **complex** fruit....tobacco, polished leather, and heavy peat smoke.”

(Johnnie Walker Blue Label; Blended)

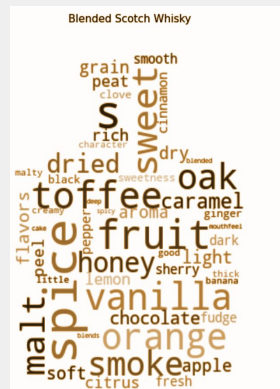


Data Analysis



Categories

1. Single Malt
2. Blended
3. Blended Malt
4. Single Grain
5. Grain



Blended

Toffee, spice, fruit, malt,
vanilla, orange

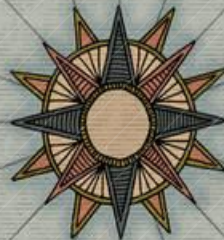
COTLAND



The Scotch Classifier

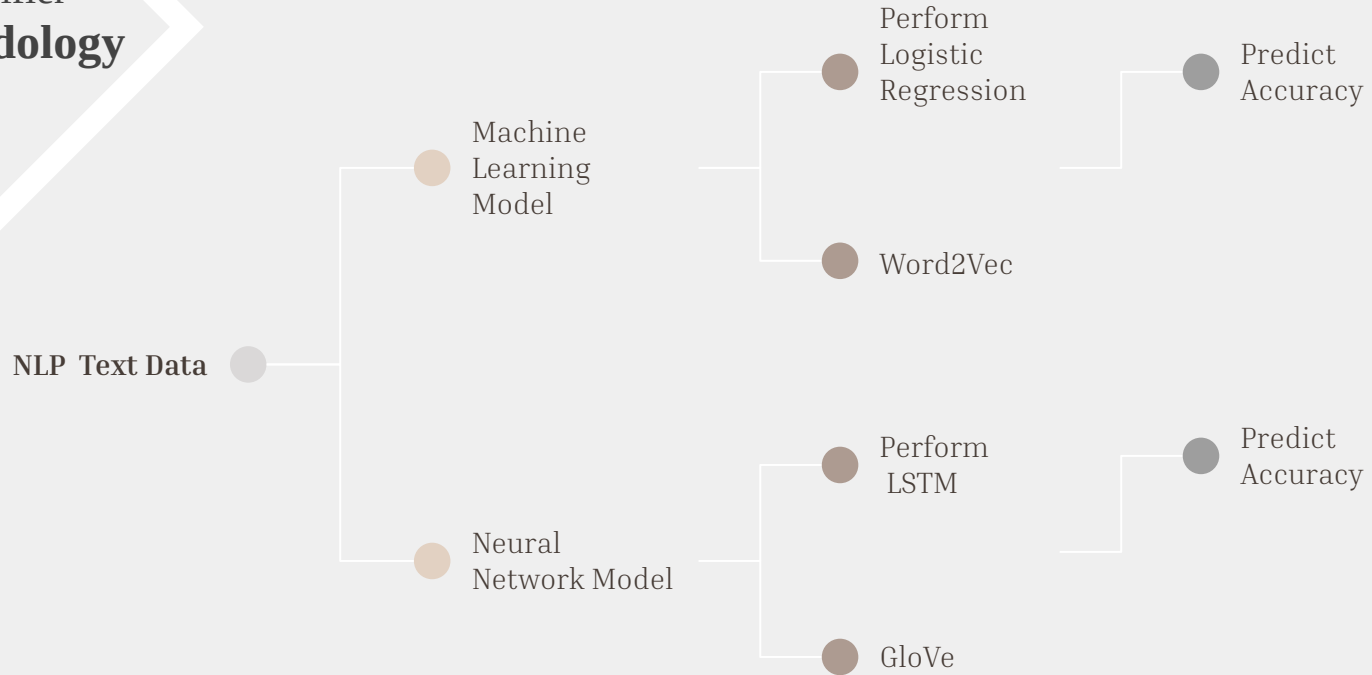


*Using Machine Learning Models
to Predict the Category of a
Scotch*



2

Classifier Methodology



Results

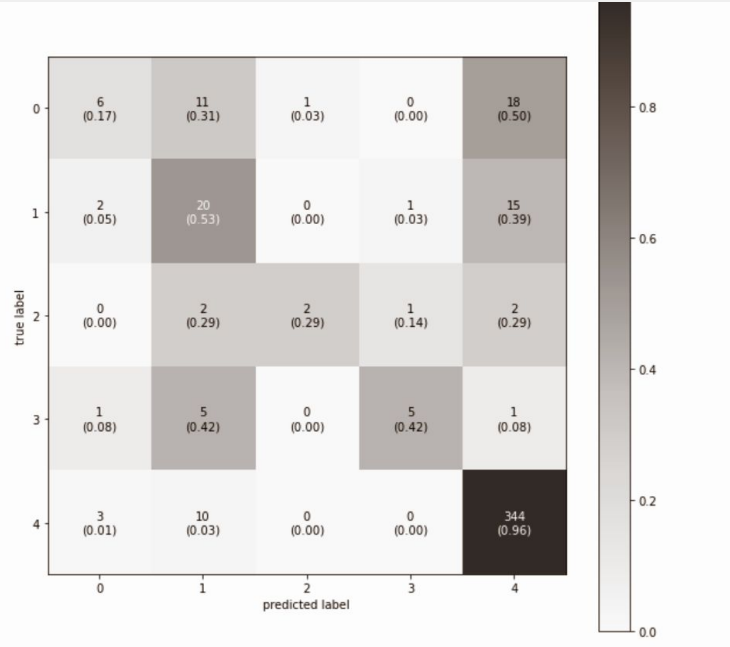
Logistic Regression Accuracy:

84%

LSTM Accuracy:

Test: 81%

Train: 82%





3. The Recommender



*The system in action! Streamlit
App Demo*

3

Recommender

Recommendation System:

NLP & NMF Topic Modeling



Objective

Use NLP to create a
Scotch recommendation
from reviews

Tools & Algorithms

- ◆ Nltk
- ◆ Text preprocessing
- ◆ TFIDF Vectorizer
- ◆ NMF Topic Modeling
- ◆ Pairwise distances
(cosine similarity)

Results

Yields fairly reasonable
results upon examination
of feature correlations

NMF Topics



Winey

Bordeaux, grape, berry, wine, red, currant, sherry, port, raspberry

Fruity

Sweet, fresh, apple, strawberry, water, light

Peaty

Earthy, smokey, seaweed, brine, linger, pepper, salt

Woody/ Nutty

Honey, vanilla, creamy, chocolate, spice, caramel

Feinty

Leather, dark, plain, cherry, fig, raisin, oloroso

Spices

Ginger, spice, chocolate, oak, vanilla, bitter

3

Recommender

How it Works:



1. Choose the flavors (topic words) you want.
(Enter your own description if you wish)
2. Pick the # of bottle recommendations you want
3. Wait...(for the system to take the pairwise distances using cosine similarity, to find you the most similar option results)...

DONE!

Let's give
it a try!

Streamlit
App



Scotch Whisky Recommender

A 'Neat' Approach to Find Your Ideal Scotch Using NLP

This Application Displays EDA and NMF Text Recommendations for Scotch
Whiskies From A *Whisky Advocate* Kaggle Dataset

Recommendation
System in Action!

Interact with Exploratory
Data Analyses!

Recommender In Action:



1. Choose between different topic words

Get A Recommendation!

Want a delicious Scotch recommendation!? From the list below, choose as many descriptive words (flavors) as you like, and the system will do the rest!

Choose an option

soft

toffee

chocolate

Recommender In Action Continued:

2. Pick the # of bottle recommendations you want
3. Wait for the results!

Get A Recommendation!

Want a delicious Scotch recommendation!? From the list below, choose as many descriptive words (flavors) as you like, and the system will do the rest!

chocolate x orange x

You selected the following 2 options:

```
[
  0 : "chocolate"
  1 : "orange"
]
```

You may also choose to enter your own bottle description below. Try to only type things you do like, versus things you don't like.

I like soft smokey whisky

Finally, please tell us how many bottles you want us to recommend for you.



Run

	name	category	review.point	price
0	Johnnie Walker Blue Lab...	Blended Scotch Whisky	97	225
1	Black Bowmore, 1964 vin...	Single Malt Scotch	97	4500
2	Bowmore 46 year old (di...	Single Malt Scotch	97	13500
3	Compass Box The General...	Blended Malt Scotch Whi...	96	325
4	Chivas Regal Ultis, 40%	Blended Malt Scotch Whi...	96	160
5	Ardbeg Corryvreckan, 57...	Single Malt Scotch	96	85
6	Gold Bowmore, 1964 vint...	Single Malt Scotch	96	6250
7	Bowmore, 40 year old, 4...	Single Malt Scotch	96	11000
8	The Dalmore, 50 year ol...	Single Malt Scotch	96	1500
9	Glenfarclas Family Cask...	Single Malt Scotch	96	3360

Compare Results



Input: “chocolate”, “orange,” “I like soft smokey whisky”

Output: Johnnie Walker Blue

“... sweeter notes of toffee and vanilla...complex fruit (both bright citrus notes and darker pit fruits)... leather, and heavy peat smoke.”

(Johnnie Walker Blue Label; Blended)

HIGHLANDS

FLAVOURS: dry, spicy, honey



SPEYSIDE

FLAVOURS: honey, fruity, hint of spice, oak dryness and light smoke



Future Work



- ❖ Scrape for more types of whisky
 - *American, Bourbon, Irish Whiskey*
- ❖ Scrape for more detailed data
 - *Particularly flavor notes and tastes*
- ❖ Create radar plots for visualization of topic variables
- ❖ Finish predicting review scores
 - *See if given a text, you can predict ratings score*

The background of the slide features a close-up photograph of two glasses filled with amber-colored whiskey and ice cubes. The glasses are resting on a rustic, light-colored wooden tray. The background behind the tray is a dark, textured surface.

Thanks!

Any Questions?



*Feel free to reach out!
You can find me at GitHub
@sconsm*

End.

Appendix Following

Project Workflow



EDA

Scotch reviews: raw text descriptions from users.

- ❖ *Whisky Advocate*
2,245 data points

Classifier

Created a classifier that predicts categories of whisky.

- ❖ *Can we predict Scotch category using NLP on text reviews?*
- ❖ *Make inferences re: regions & category*

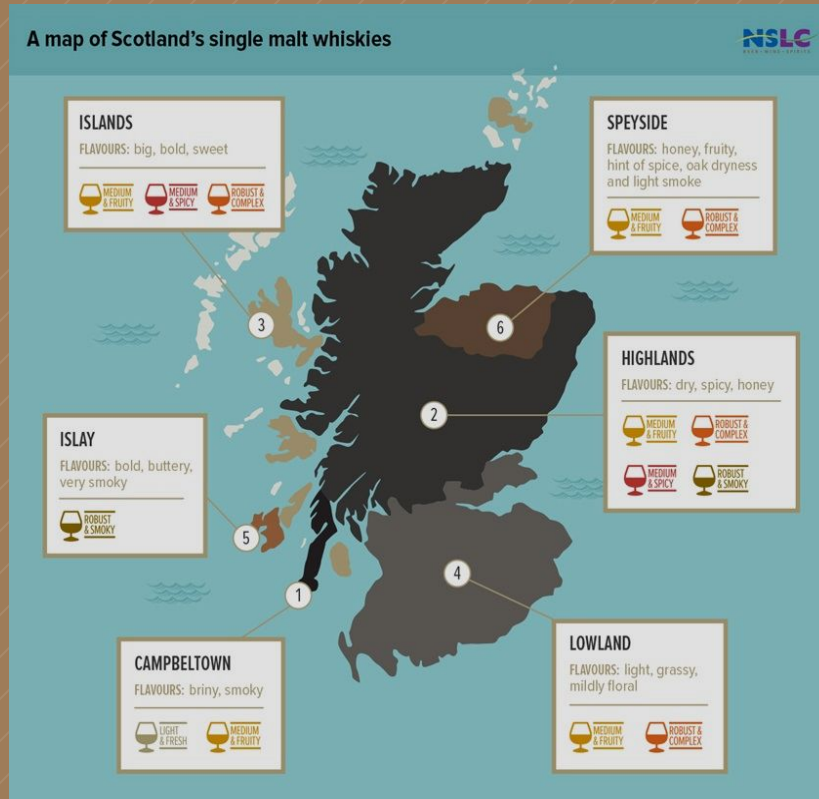
Recommender

NMF topic modeling and text recommendation system using NLP.

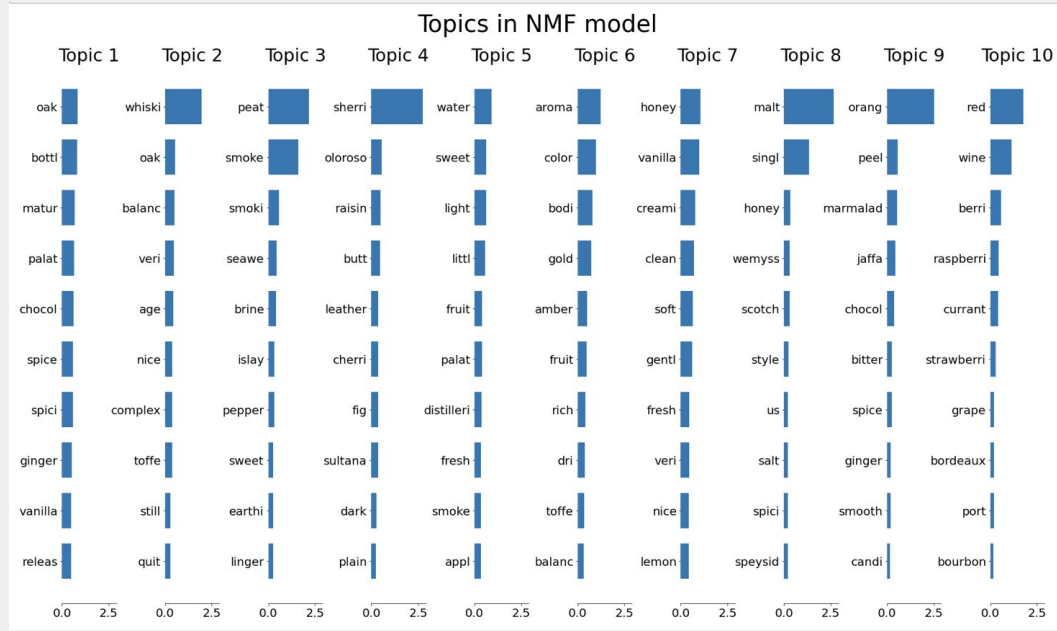
- ❖ *Recommends x bottles of similar whiskies, based on a user's inputted flavor preferences*

For Fun:

Try and match
category to
region!



APPENDIX

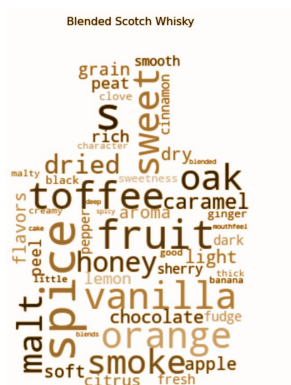


Text In Each Scotch Category



Single Malt

Vanilla, sweet,
fruit, long,
maturd



Blended

Toffee, spice, fruit,
malt, vanilla,
orange



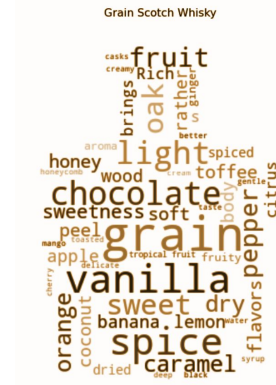
Blended Malt

Smoky, fruit,
spice, pepper,
chocolate



Single Grain

Spice, vanilla,
apple, sweet,
fruit



Grain

Vanilla, spice,
chocolate,
caramel

2

Classifier

Scotch Classifier



Predicting Categories

Objective

Create a predictive ML model that accurately predicts Scotch categories

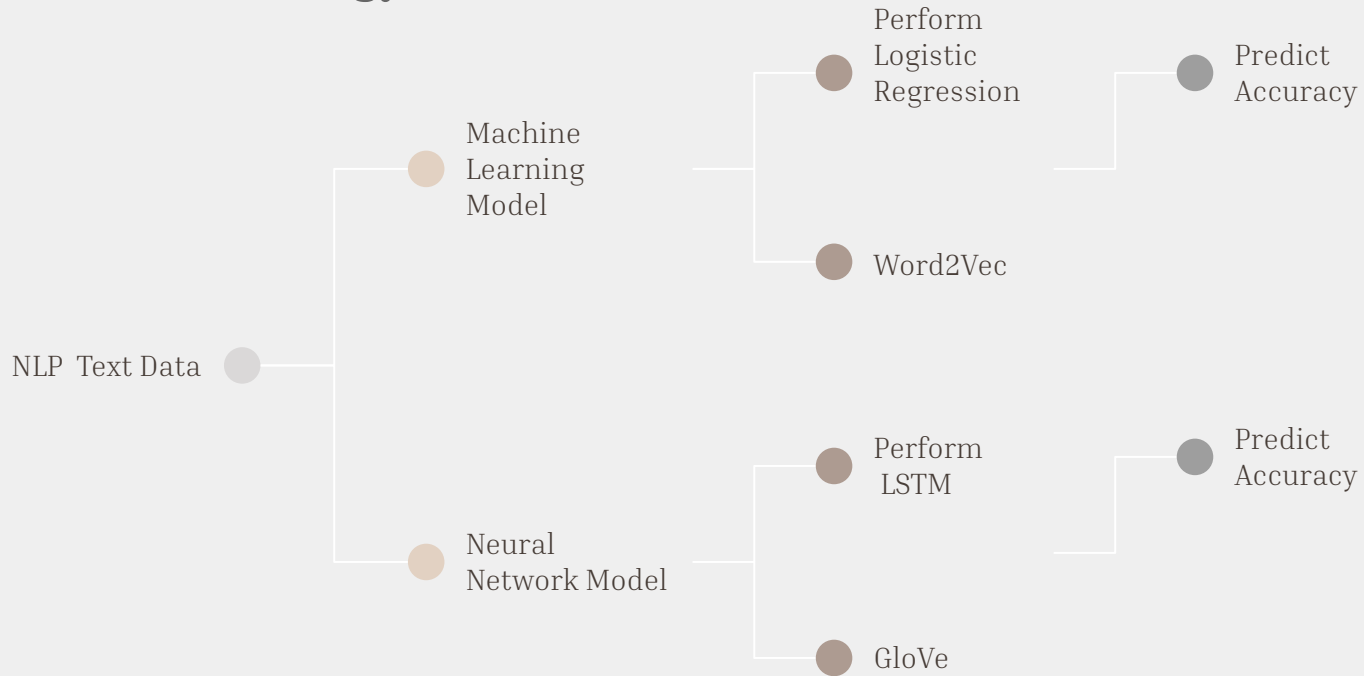
Tools & Algorithms

- ◆ Logistic Regression
- ◆ LSTM
- ◇ GloVe

Results

- ◆ Classify Scotch bottles by category
- ◆ Make judgments and inferences on associated regions and flavors

Classifier: Methodology



Scotch Whisky Regions



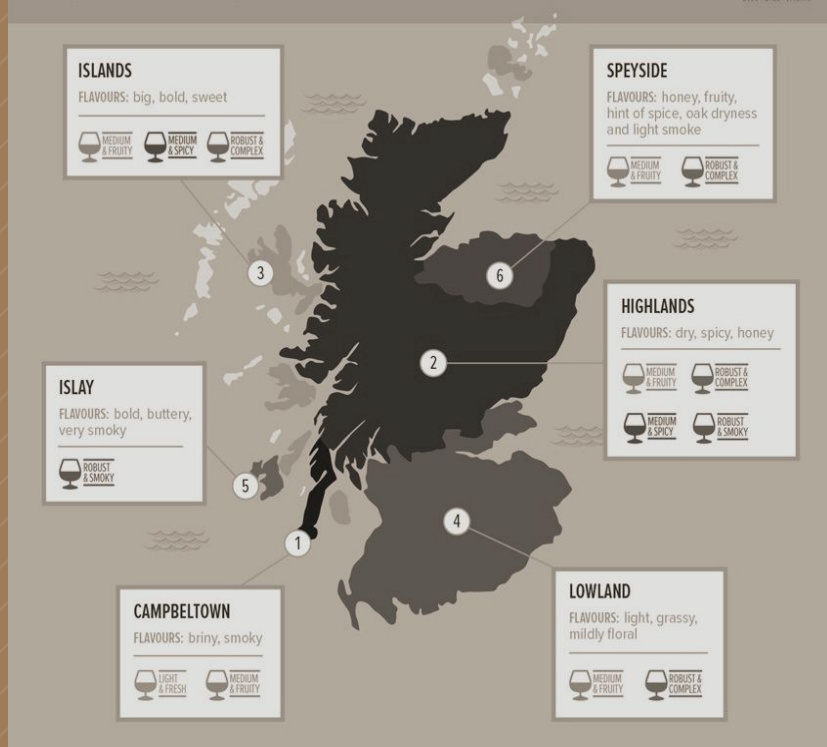
Regions & Flavors



1. Islands
 - Fruity, spicy, bold, sweet
2. Speyside
 - Honey, fruit, oak, light smoke
3. Highlands
 - Dry, spicy, honey, smokey
4. Lowland
 - Light, grassy, fruit, floral
5. Campbeltown
 - Brinky, smokey, fresh, fruity
6. Islay
 - Bold, buttery, robust smoke

A map of Scotland's single malt whiskies

NSLC
NATIONAL SINGLE MALT WHISKY COUNCIL



Radar Plots

