
Cocktail
Recommendation
System

We have an option for you!

When you go to the bar always order the same drink?

# Business Problem

To build a recommendation system based on drink and cocktail recipes from aroun d the world.

# Machine Learning Problem

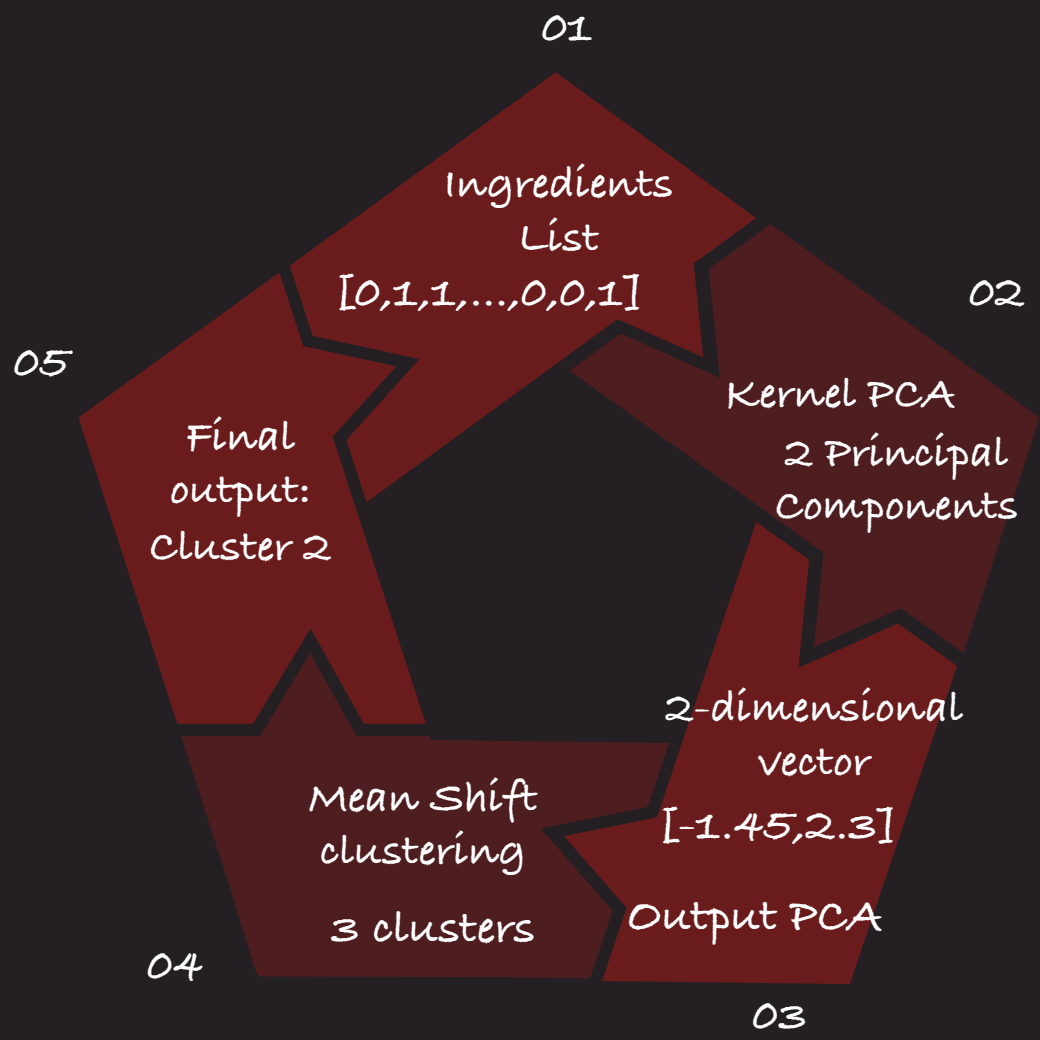
## ONE OF THE CENTRAL AREAS OF RESEARCH IN ML

Recommendation systems are a very well studied area of Machine Learning, generally relying on unsupervised learning techniques or reinforcement learning

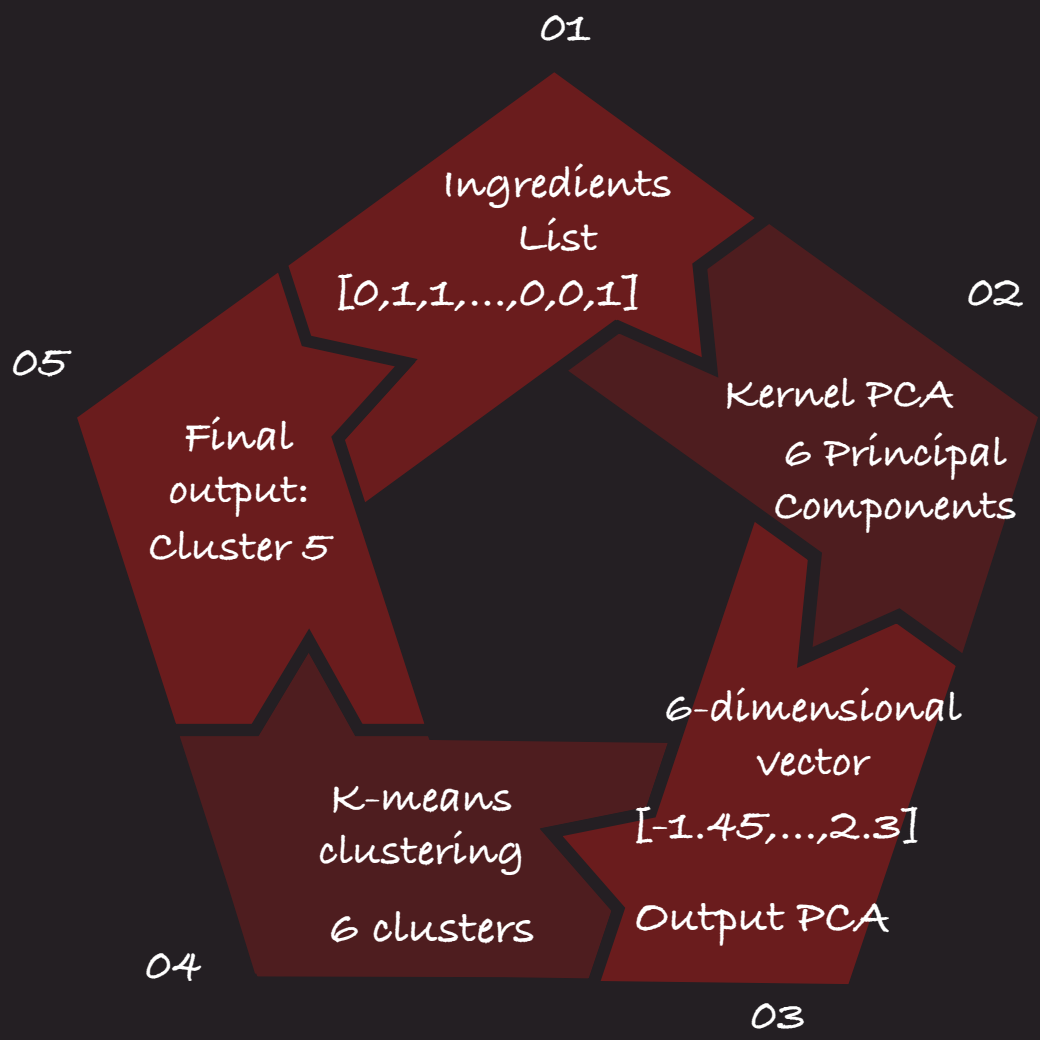
## CLUSTERING RECOMMENDATION IS WELL STUDIED

For our specific problem, we implement two different clustering models to generate the predictions: K-Means and Mean-Shift

# Machine Learning Components




Mean Shift clustering




K-means clustering

# Data Ingestion and Feature Engineering

## DATA SOURCES

We call TheCocktailDB API, the output is a JSON object with the information that we requested.

## CLOUD STORAGE

We access the extracted data in Big Query, where we build a table that stores the info.

## DATA PROCESSING

After our initial data load, we manipulate and transform the data in SQL as a follow p step to be able to use it.

The first thing we do is that we turn the cocktails into an occurrence matrix for ingredients, 0 if it does not occur in the cocktail, 1 if it does.

# Data Ingestion and Feature Engineering


www.thecocktaildb.com/api/json/v1/1/search.php?f=a

```
drink_jaison["strInstructionsZH_HANS"] = drink_jaison["strInstructionsZH-HANS"]
del drink_jaison["strInstructionsZH-HANS"]
```

```
path = f"cocktails/{letter[0]}/ingredients.json"
```


{"idDrink": "11000", "strDrink": "Mojito", "strDrinkAlternate": null, "strTags": "IBA,ContemporaryClassic,Alcoholic,USA,Asia,Vegan,Citrus,Brunch,Hangover,Mild",
"strVideo": null, "strCategory": "Cocktail", "strIBA": "Contemporary Classics", "strAlcoholic": "Alcoholic", "strGlass": "Highball glass", "strInstructions":
"Muddle mint leaves with sugar and lime juice. Add a splash of soda water and fill the glass with cracked ice. Pour the rum and top with soda water. Garnish and serve with straw.",
"strInstructionsES":
null, "strInstructionsDE": "Minzbl\u00e4tter mit Zucker und Limettensaft verr\u00fchren. F\u00fcge einen Spritzer Sodawasser hinzu und f\u00fclle das Glas mit gebrochenem Eis.
Den Rum eingie\u00dfen und mit Sodawasser \u00fcbergie\u00dfen. Garnieren und mit einem Strohhalm servieren.", "strInstructionsFR": null, "strInstructionsIT":
"Pestare le foglie di menta con lo zucchero e il succo di lime.\r\nAggiungere una spruzzata di acqua di seltz e riempi il bicchiere con ghiaccio tritato.\r\nVersare il rum e riempire con acqua di seltz.\r\nGuarnire con una fetta di lime, servire con una cannuccia.", ": null}


```
CREATE EXTERNAL TABLE IF NOT EXISTS `{{ params.project_id }}.cocktails_dataset.cocktail_dag`
OPTIONS (    uris = ['gs://{{ params.bucket }}/cocktails/*/ingredients.json'],    format = 'NEWLINE_DELIMITED
JSON' );
```

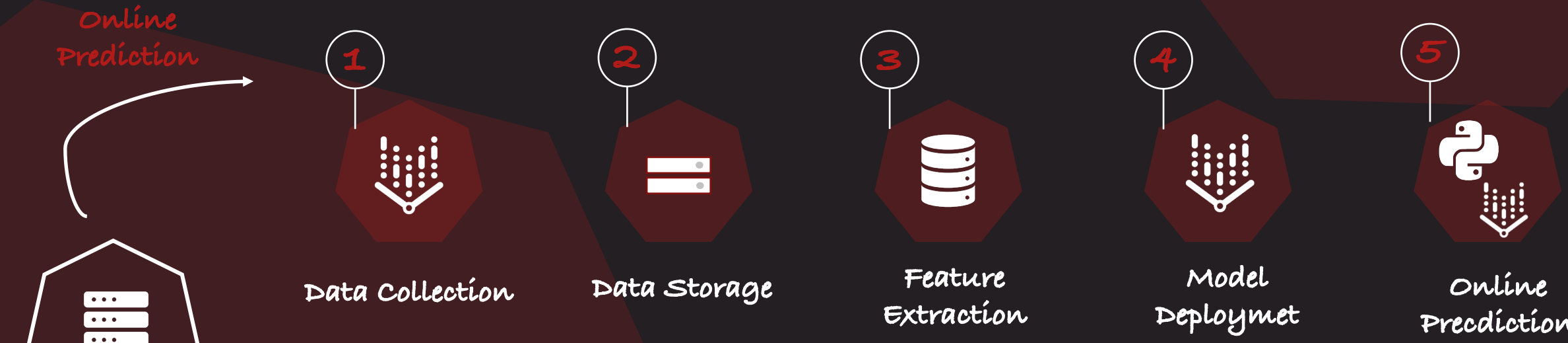
| | idDrink | strDrink | strIngredient1 | strIngredient2 | strIngredient3 |
|---|---|---|---|---|---|
| 420 | 178359 | Kiwi Martini | Kiwi | Sugar Syrup | Vodka |
| 421 | 17181 | Dirty Martini | Vodka | Dry Vermouth | Olive Brine |
| 422 | 178349 | Snowday | Vodka | Amaro Montenegro | Ruby Port |
| 423 | 178343 | Michelada | Beer | Tomato Juice | Lime Juice |

Transform letters to lowercase

One Hot Encoding

```
0      {'vodka': 1, 'light rum': 1, 'gin': 1, 'tequil...
1      {'light rum': 1, 'lime': 1, 'sugar': 1, 'mint'...
2      {'bourbon': 1, 'angostura bitters': 1, 'sugar'...
3      {'gin': 1, 'campari': 1, 'sweet vermouth': 1, ...
4      {'blended whiskey': 1, 'lemon': 1, 'powdered s...
                           ...
420    {'vodka': 1, 'kahlua': 1, 'sugar syrup': 1, ''...
421    {'baileys irish cream': 1, 'kahlua': 1, 'sambu...
422                        {'vodka': 1, 'ouzo': 1, '': 1}
423    {'southern comfort': 1, 'triple sec': 1, 'lime...
424    {'orange bitters': 1, 'green chartreuse': 1, '...
Name: bagofwords, Length: 425, dtype: object
```

# System Design

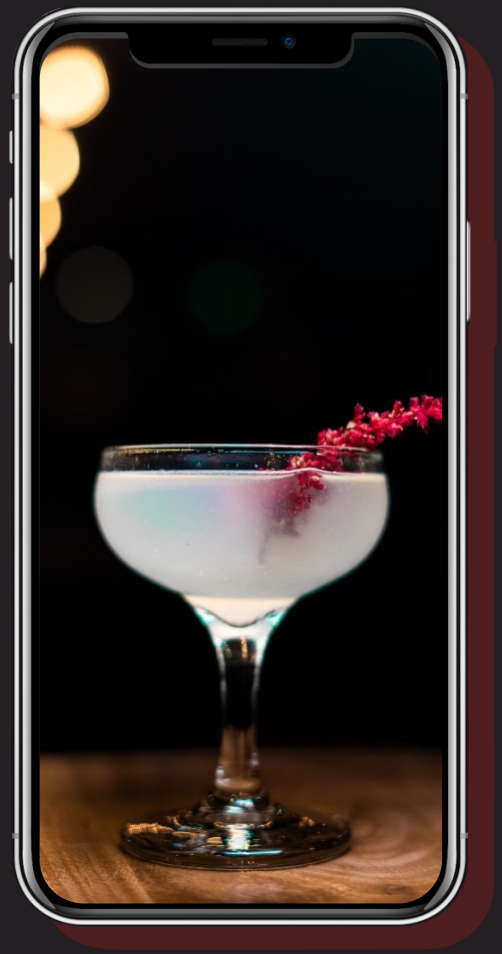



# Reflections

What would you do different?

What were some challenges?

What would you do next?




thank
you