



CULINARY *Connect*

A Smart Recipe Recommendation and
Nutrition Analysis Platform



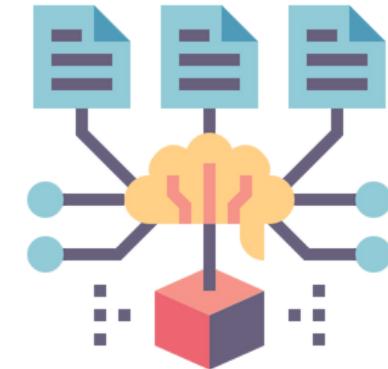
OVERVIEW



BUSINESS
PROBLEM



DATA
UNDERSTANDING



MODELLING



EVALUATION



DEPLOYMENT



CONCLUSION

■ INTRODUCTION

Food is central to culture. African and International cuisine offers rich diversity and flavors. This project develops an AI-powered Recipe Recommendation System and Sentiment Analysis Model to help users discover authentic African and international recipes tailored to their preferences.





■ BUSINESS PROBLEM

African and International cuisine platforms struggle with low engagement due to generic recommendations and limited sentiment analysis. We propose a personalized recipe recommendation system with sentiment analysis to enhance user experience, retention, and platform authority.

■ BUSINESS OBJECTIVES

The goal is to develop a recipe recommendation system and sentiment analysis model to enhance user satisfaction through personalized suggestions. It will improve decision-making with data-driven insights, optimize recipes based on feedback, and drive revenue by boosting traffic to food blogs, e-commerce, and cooking classes.



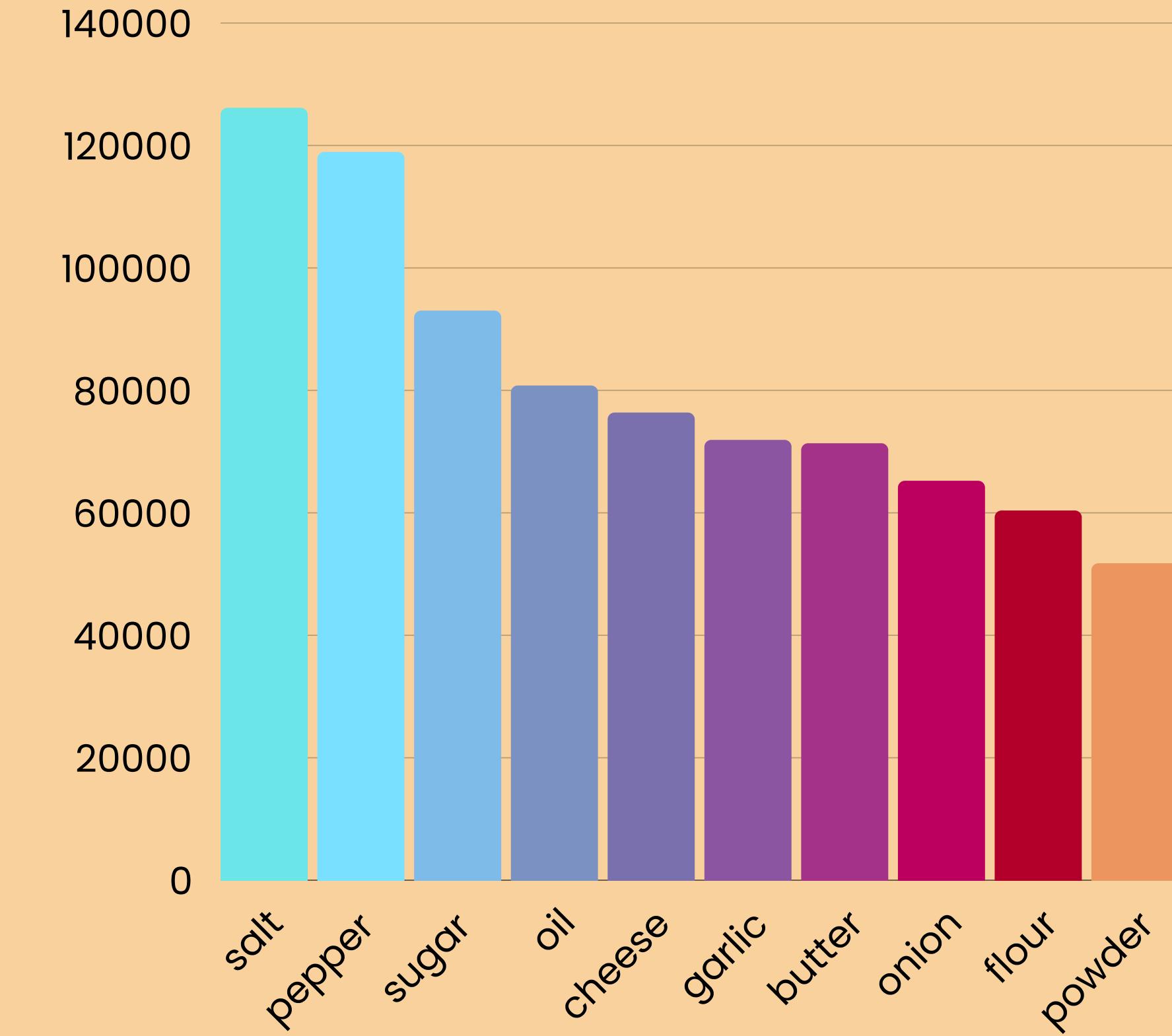


Correlation of Features to Nutrients

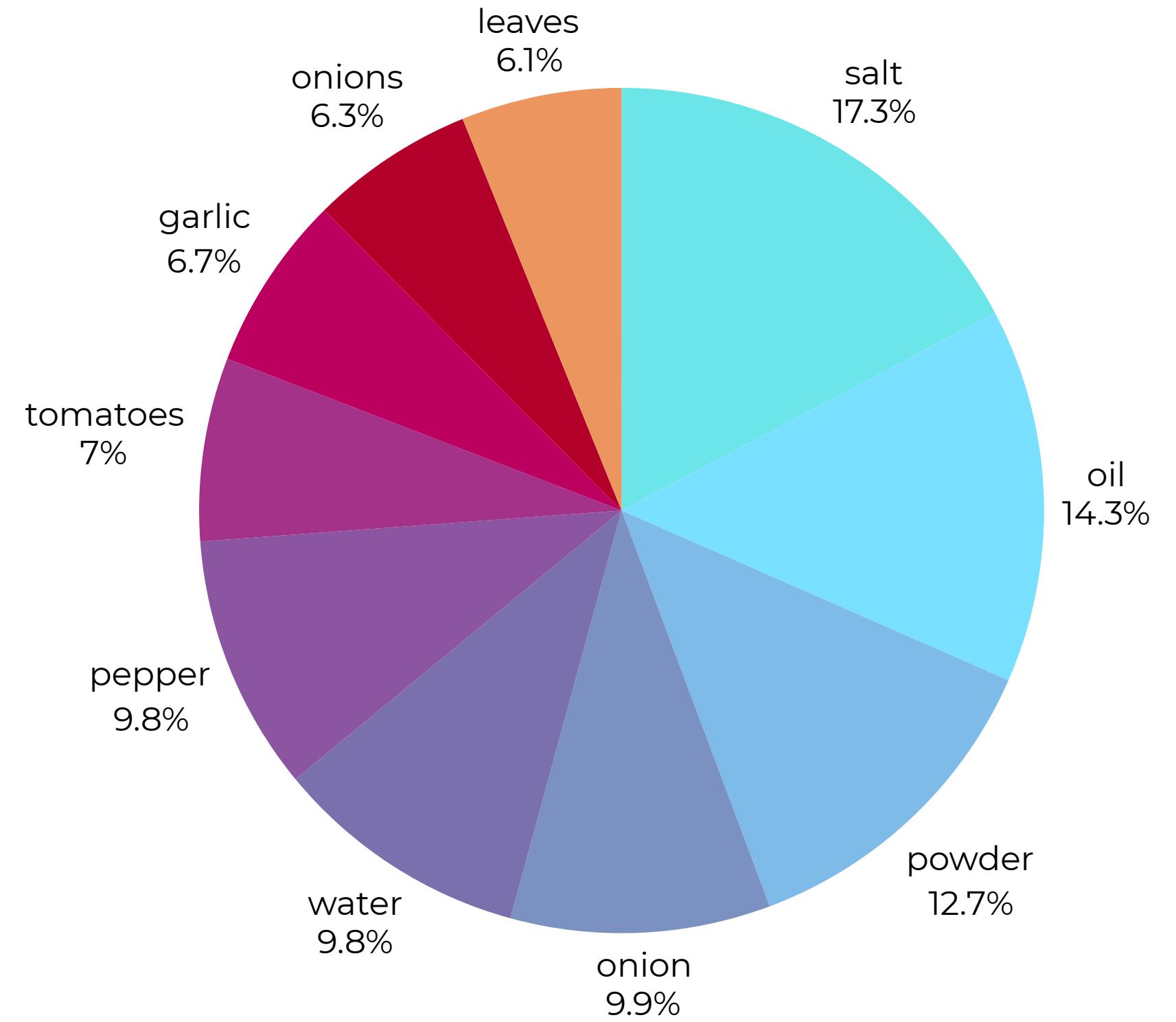
- Calories, total fat, and saturated fat are closely related—foods higher in fat tend to be higher in calories.
- Sodium and potassium show little to no correlation with fat and calorie content.
- Sodium and saturated fat are mostly independent, meaning a food high in one does not necessarily have high amounts of the other.

**Salt is the most common
ingredient in African
Cuisine**

Visualization for the most common ingredient in African Dishes

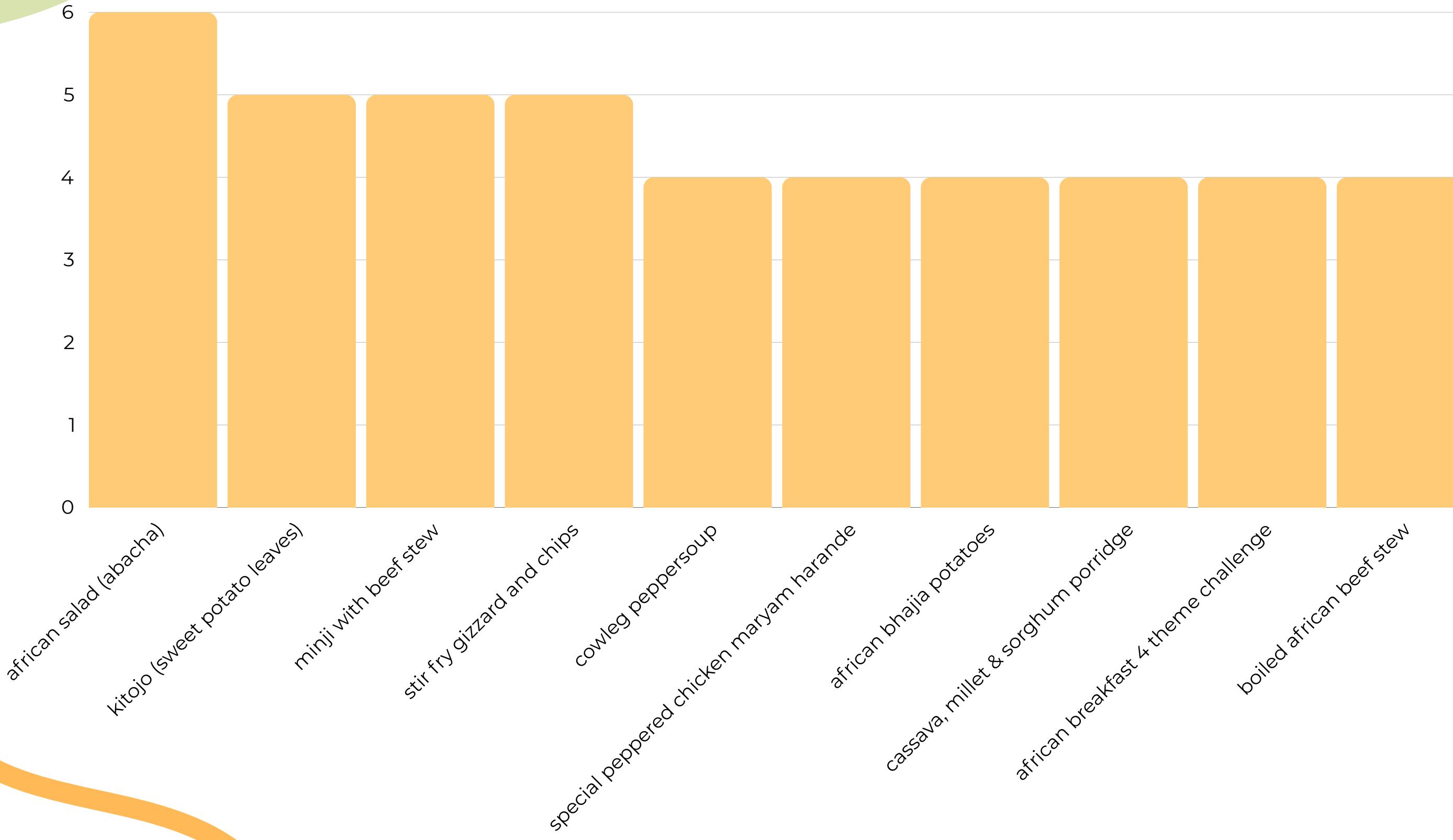


Top 10 Most common Ingredients on African Dishes

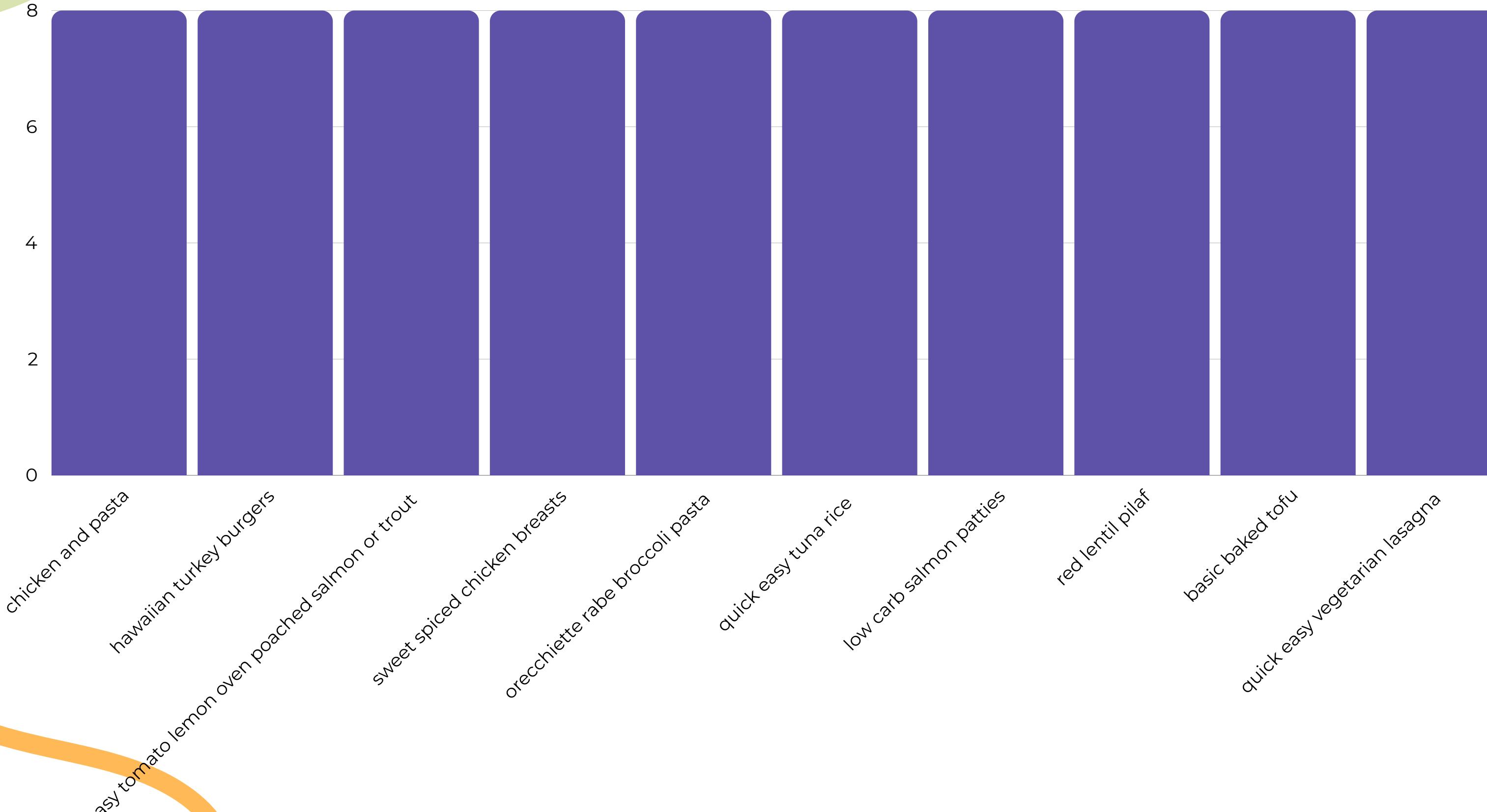


Salt is the most common
ingredient on any African dish

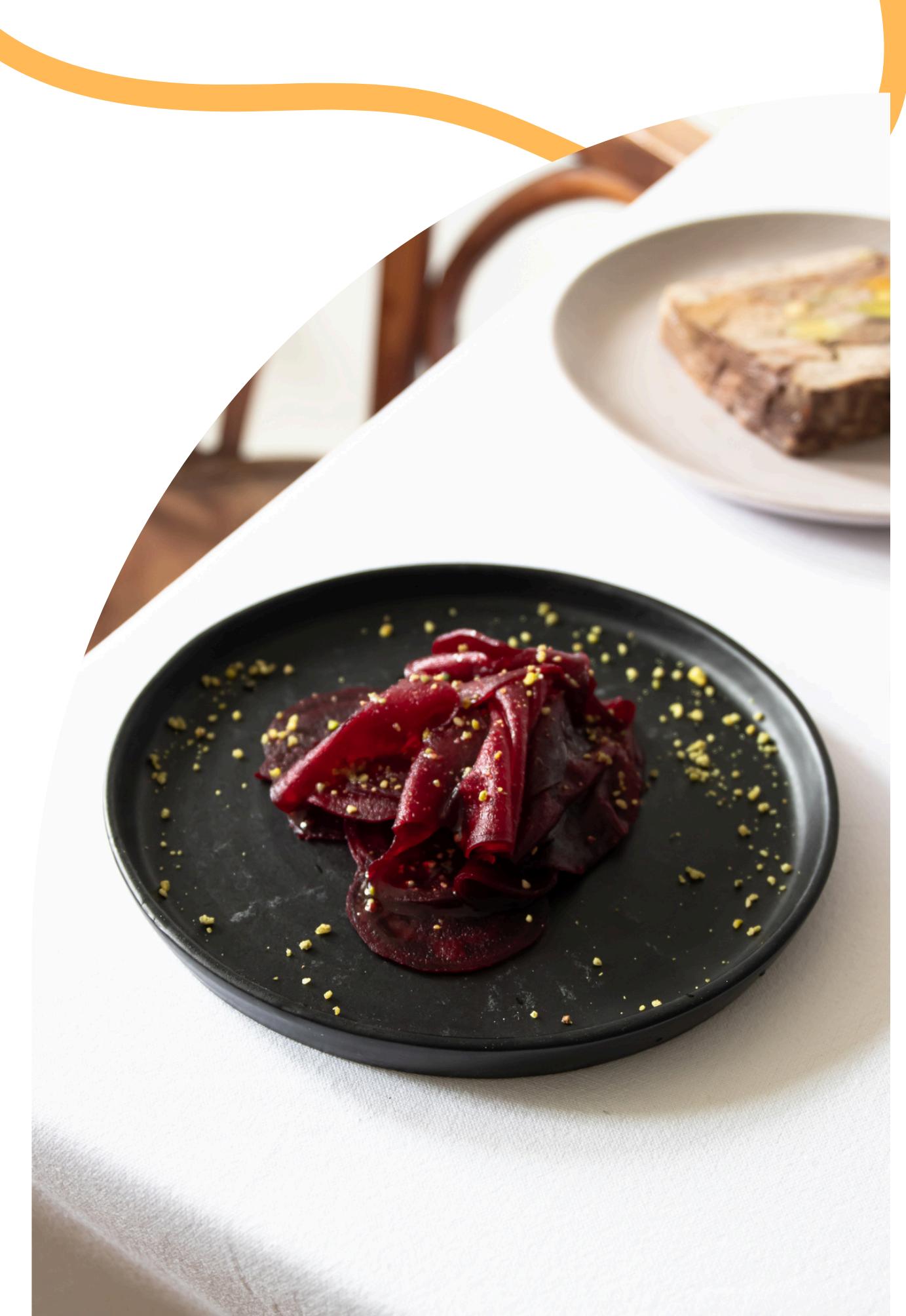
Visualization for the healthiest African Recipes



Visualization for the healthiest African Recipes



MODELLING



Recommendation System

Objective:

- Provide personalized recipe suggestions to users based on preference, past interactions or similarities.

Modelling Techniques used:

Content-Based Filtering:

- It utilizes TF-IDF or cosine similarity to recommend recipes based on ingredient overlap.

Collaborative Filtering:

- Leverages user item interaction matrix for personalized suggestions.

Evaluation Metrics:

Content-Based Model Results:

- MSE: 0.1214
- RMSE: 0.3484

Key Insights:

- The model shows low prediction error, indicating good accuracy.
- Predictions deviate by ~0.35 units on average.
- Content-based filtering performs well for personalized recipe recommendations.

Recommendation System Deployment

User Input

Deploy

Recipe Intelligence Recommender

WHAT IS BEST DISH FOR YOU!!!

Enter your preferences

A good breakfast dish

Maximum calories

300

Cooking Time

Less than 30 minutes

Select Recipe Type

African

Get Recommendations

This image shows a user interface for a recommendation system, specifically a recipe recommender. The interface is dark-themed with white and light gray text. At the top right is a 'Deploy' button. The main title is 'Recipe Intelligence Recommender' followed by a large, bold, white text 'WHAT IS BEST DISH FOR YOU!!!'. Below this, there's a text input field with the placeholder 'Enter your preferences' and a dropdown menu containing 'A good breakfast dish'. To the right of the input field are two sliders: one for 'Maximum calories' set at 300 with increment (+) and decrement (-) buttons, and another for 'Cooking Time' with the option 'Less than 30 minutes'. Below these sliders is a dropdown menu for 'Select Recipe Type' with 'African' selected. At the bottom is a prominent red button labeled 'Get Recommendations'.

Recommendation System Deployment

Recommended Recipes

A screenshot of a web-based recommendation system interface. The interface has a dark background with a red header bar at the top containing the word "Deploy". Below the header is a red button labeled "Get Recommendations". A green callout box contains the text "Here are your personalized recipe recommendations!". Below this, five recipe cards are listed, each with a small thumbnail icon and a title. To the right of each card is a downward-pointing arrow icon.

- Kenyan omelette
- Sig's North African Salad
- African kales
- Kenyan delicacy "Vitumbua"
- My African salad

Recommendation System Deployment

More details on the recommended recipe

 Kenyan omelette

Calories: 0.2

Cooking Time: 8 minutes

Ingredients:

3 eggs, 1 tbsp oil, 1/2 tea spoon of salt

Steps:

Step 1, Into a bowl break 3 eggs and mix well with a hand mixer., Step 2, Then put one tbsp of oil into a pan and heat the pan., Step 3, Then add salt to the raw eggs and mix very well so that salt doesn't remain in one place, Step 4, Then pour the eggs to the heated pan and allow it to cook for about 3 minutes., Step 5, Then turn the other side and let it cook also for 2minutes., Step 6, Then serve with tea for breakfast or with bread.

 Sig's North African Salad

 African Salad

Sentimental Analysis Modelling

Objective:

Classify user reviews into positive, neutral or negative sentiments, to understand user preferences and improve engagement

Modelling Techniques Used:

Data Preprocessing:

- Cleaning text data by removing stopwords, punctuation and special characters.
- Tokenization and vectorization using TF-IDF or Word Embeddings for feature extraction.

Model Selection and Training:

- **Logistics Regression:** It's used to predict the sentiment category.

Evaluation Metrics

- Accuracy - 96 %

Recommendation System

User Input

Deploy

Recipe Intelligence Recommender

WHAT IS BEST DISH FOR YOU!!!

Enter your preferences

Maximum calories

300

A good breakfast dish

Select Recipe Type

Cooking Time

Less than 30 minutes

African

Get Recommendations

How Recommendation & Sentiment Analysis Work Together

Recommendation System → Suggests recipes based on calories, ingredients, cooking time

- ◆ Sentiment Analysis → Analyzes user reviews to understand satisfaction & improve recommendations

↻ Feedback Loop:

✓ Positive reviews → Boost recipe ranking

✗ Negative reviews → Lower ranking or adjustments

📊 Continuous Improvement → Enhances user satisfaction & engagement

Recommendation

User Personalization: Tailor recommendations based on user preferences and profiles.

Diverse Recipes: Include a wide range of African cuisines with nutritional information.

Interactive Features: Add cooking tips and ingredient substitution suggestions.

Community Engagement: Enable user reviews, ratings, and social sharing.

Sentiment Analysis: Use feedback to adapt recommendations and identify trends.

Visual Appeal: Feature high-quality images and video tutorials for recipes.

Accessibility: Offer multi-language support and ensure mobile optimization.

Analytics Dashboard: Monitor user engagement and refine algorithms accordingly.

Collaborations: Partner with local chefs and promote cultural events.

Marketing Strategy: Utilize content marketing and referral programs to grow your user base.

CONCLUSION

- The Sentiment Analysis Model provides valuable insights into customer opinions, allowing businesses to improve their offerings. However, refining text cleaning and model tuning can improve accuracy.
- The Recommendation System successfully suggests recipes but can be enhanced with personalized filtering and user feedback loops.
- Implementing these models in a real-world food app can boost user engagement, improve satisfaction, and increase retention rates.

NEXT STEPS

Build a Chatbot for User Engagement

Chatbot Features:

- Provide recipe suggestions based on user mood (using sentiment analysis results).
- Answer nutrition-related questions (calories, ingredients, dietary preferences).
- Support voice commands for an interactive experience.

Tools & Technologies:

- Use Rasa, Dialogflow, or GPT-based models for chatbot development.
- Deploy on Telegram, WhatsApp, or a web app for user access.

GROUP 9, PHASE 5.

Meet The Team

