

AFRICURA

Travel Recommendation System



Unlock Africa's Hidden Gems: Personalized Travel Recommendations at Your Fingertips!

Meet the team

Introducing the Dream Team: Unleashing the Power of Data to Shape Your African Adventure!"



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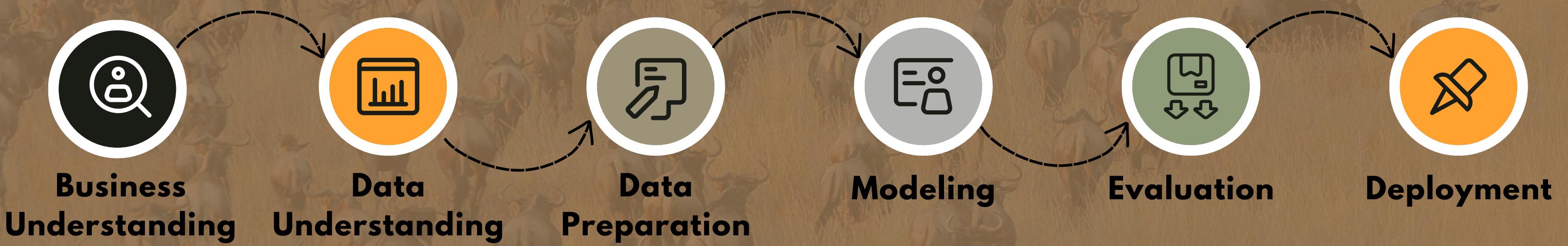
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CRISP-DM Roadmap

This project was carried out using the CRISP-dm methodology



Overview

- **Tourism is a powerful vehicle for economic growth and job creation all over the world.**
- **As African economies ease Covid-19 restrictions to strengthen their financial situations, the tourism sectors in the region are experiencing a resurgence.**
- **A travel recommender system can drive tourism growth by delivering personalized recommendations, enhancing user experiences, promoting lesser-known destinations and continually improving its recommendations based on user feedback.**

Problem Statement

- Tourists face immense challenges in finding suitable travel destinations that align with their preferences, budget, and time constraints.
- The main aim of AfricuraAI is developing a recommendation system that suggests ideal tourist destinations based on customer reviews, budget limitations, specific locations and amenities

Business Understanding

- AfricuraAI is a business dedicated to revolutionizing travel exploration in Africa using machine learning.
- AfricuraAI Recommendation system provides personalized recommendations for the best tourist destinations in Africa

Business Understanding

Objectives

- Creating a recommendation system based on budget.
- Identifying top destinations in Africa
- Fostering customer loyalty
- Increasing customer engagement, generating revenue, and collecting user information and feedback

Goals

- Building a machine learning model to predict hotel ratings
- Establishing evaluation metrics
- Implementing a real-time recommendation feature
- Deploy the recommendation system using streamlit

Success Metric

- Root Mean Squared Error (RMSE) close to 0 to evaluate model efficiency

Data Understanding

The data scrapped from Tripadvisor, stored in Json files and loaded into python

Data Mining

This data was for 15 top destinations in Africa which are Egypt, South Africa, Cape verde, Kenya, Uganda, Tanzania, DRC, Rwanda, Senegal, Morocco, Namibia, Madagascar , Ethiopia, Malawi, Ghana, Seychelles, Zambia

It contained 35836 rows and 65 columns. 8 Columns were of datatype integer and float while the rest were object columns.

Data Preparation

1

SELECTING

We identified specific columns out of 65 that were relevant to the dataset

2

CLEANING

Cleaning involved removing missing values in the dataset and in other cases filling using back filling and forward filling techniques.

3

FORMATING

Formatting included extracting important attributes from the Json dictionaries.

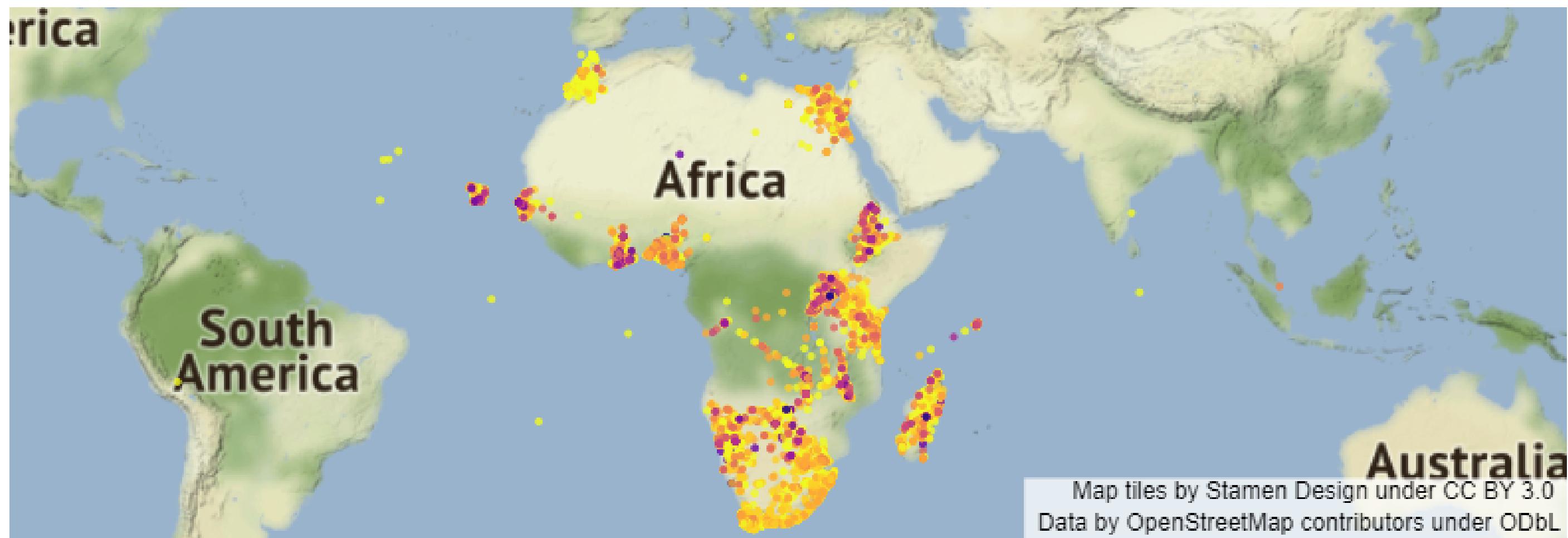
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FEATURE ENGINEERING

We formed new features like regional_rating from preexisting ones

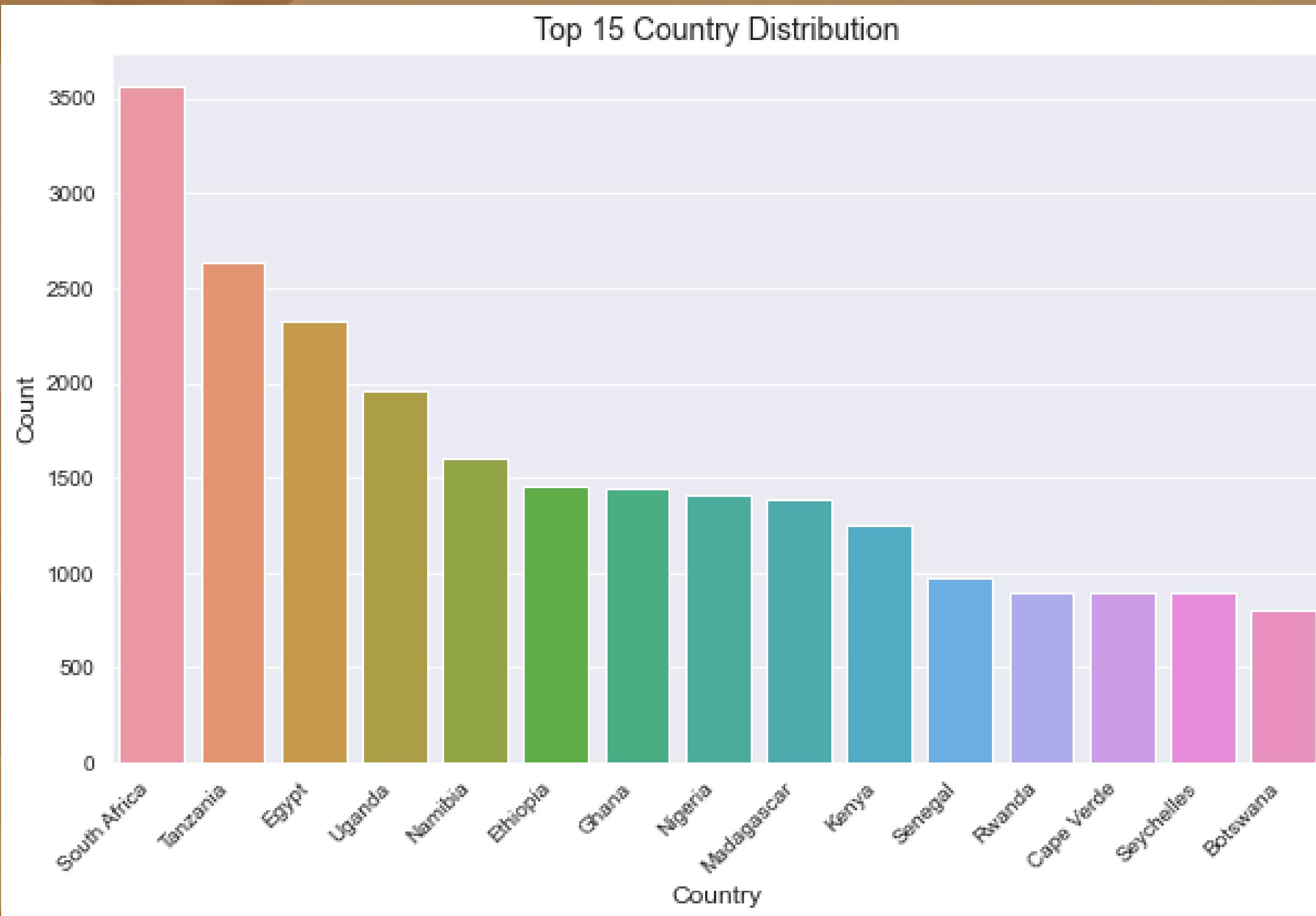
A map showing the distribution of attraction sites

Places to visit by Location



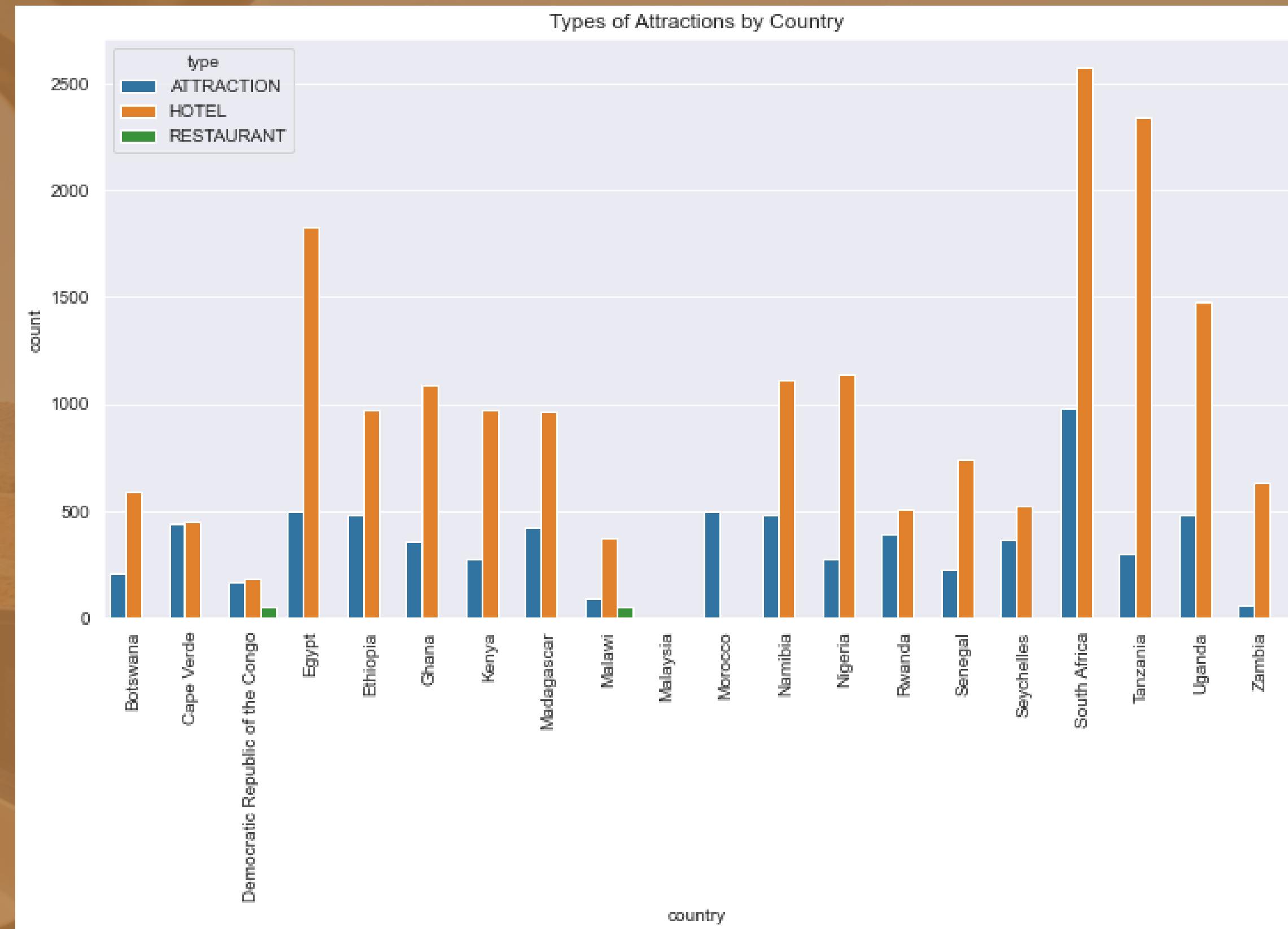
The distribution of destinations per country

Top 15 Country Distribution

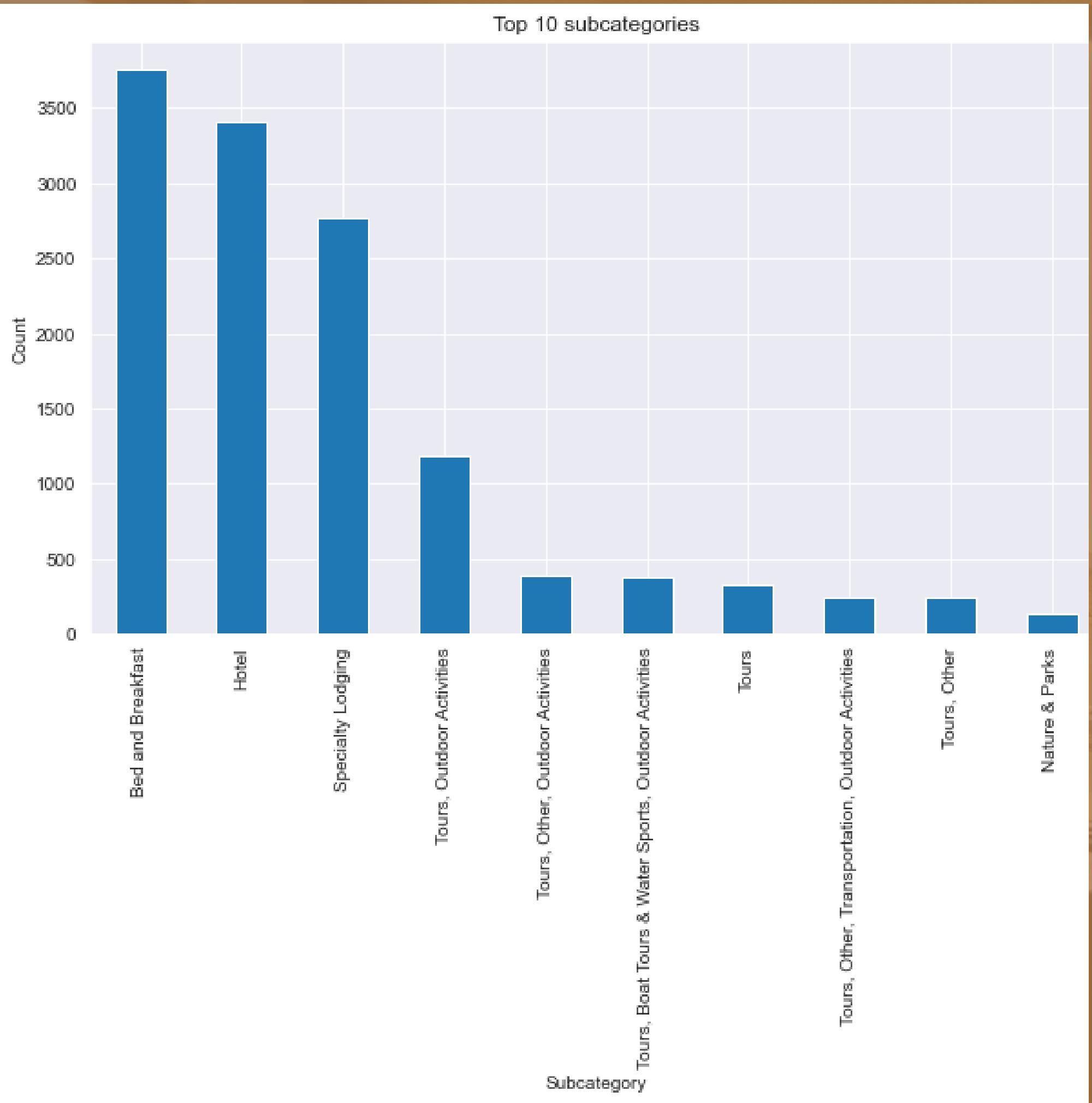


South Africa is the leading destination being followed by Tanzania and Egypt.

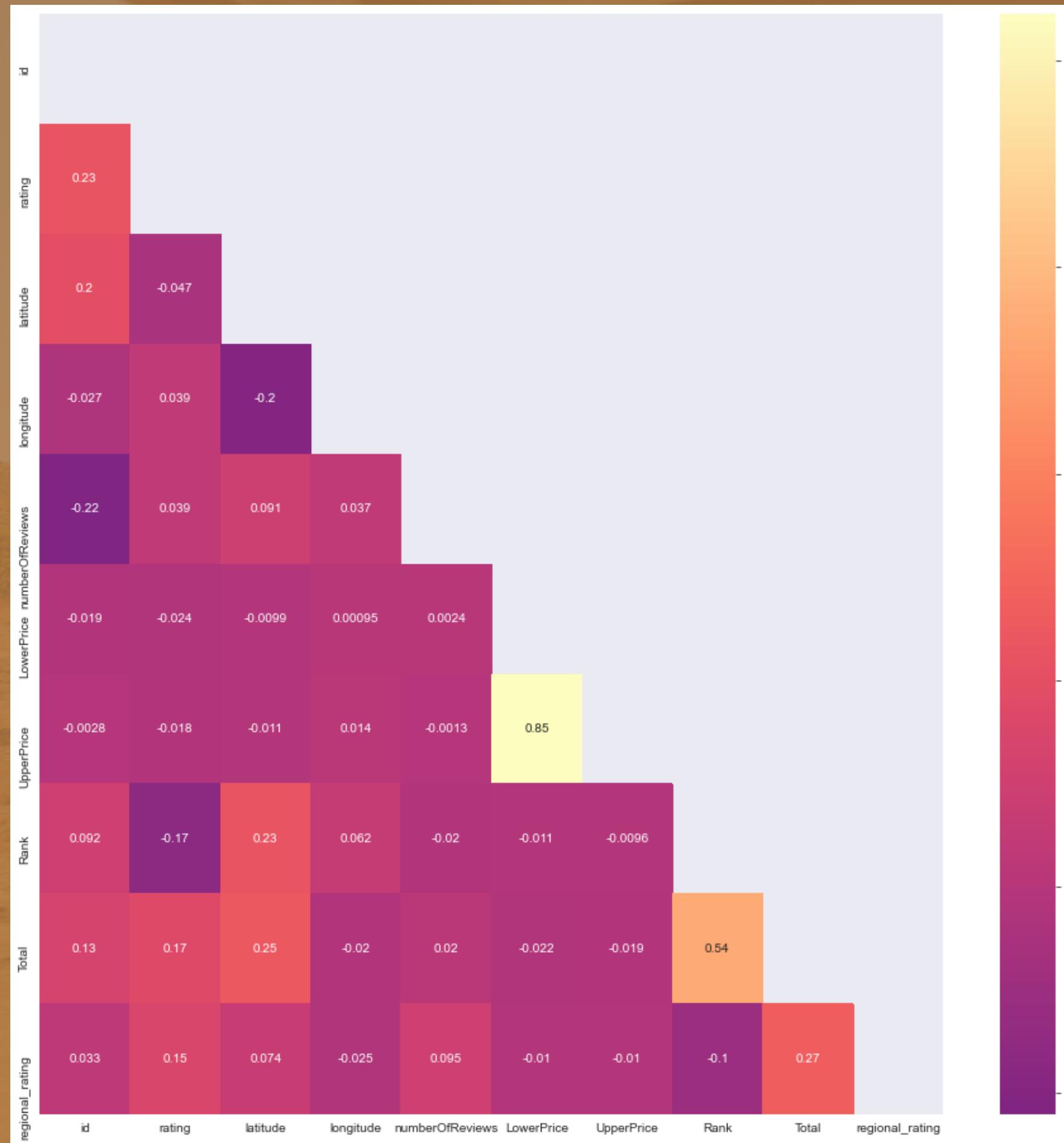
The distribution of attraction types per country



**Hotels are the leading attractions for tourist in all the countries followed by attraction.
Restaurant is the least preffered attraction in all countries.**



The graph shows the top subcategories for tourist destinations in Africa. Bed and breakfast leads followed by Hotel and speciality lodging.



There appears to be very little correlation between features apart from upper and lower price.

MODELLING

KNN Basic Model

- Baseline Root Mean Square Error (RMSE): 0.7157

- Baseline Mean Absolute Error (MAE): 0.5230

These metrics provide a measure of the model's prediction accuracy and the average difference between predicted and actual ratings.

SVD Model

MODELLING

- Root Mean Square Error (RMSE):
0.7066

- Mean Absolute Error (MAE): **0.5142**

A lower RMSE value of **0.7066** signifies improved accuracy in our predictions, indicating a reduction in the average error of approximately **0.7066** units.

MODELLING

NMF Model

- Root Mean Square Error (RMSE):
0.7157
- Mean Absolute Error (MAE): 0.5103

With an RMSE of 0.7157 and an MAE of 0.5103, this model showcases its ability to accurately predict user ratings and provide personalized recommendations.

MODELLING

Ensemble Methods

- Blended model achieves remarkable RMSE of 0.7034

- Mean Absolute Error (MAE): 0.5099

We scaled the data using MinMaxScaler for optimal feature representation and leveraged ensemble methods, combining NMF, SVD, and SVDpp models with Majority Voting

DEPLOYMENT

- We deployed using streamlit.
- The deployment has a landing page with the introduction and about , a recommendation page with sections to recommend based on countries, attraction, name of the place and amenities and a gallery page.

RECOMMENDATIONS

User-Friendly Interface

Designing the travel recommender system with a user-friendly interface that is intuitive and easy to navigate, ensuring a seamless user experience.

Comprehensive Destination Coverage

Ensuring that the travel recommender system covers a wide range of destinations, both popular and off-the-beaten-path, to cater to diverse traveler preferences.

Real-Time Data Integration

Integrating real-time data sources, such as weather updates, local events, and tourist influx, to offer up-to-date and relevant recommendations to users.

CONCLUSIONS

Tourism Diversity

By showcasing lesser-known destinations, the recommender system can encourage travelers to explore new places, diversifying tourism and distributing visitor traffic more evenly.

Continuous Improvement

By analyzing user feedback and travel patterns, the system continually learns and improves its recommendations, enhancing the overall travel experience for users.

Personalized Experiences

The travel recommender system offers tailored recommendations, enabling travelers to discover destinations and experiences that align with their interests.



Thank you