Data Storytelling

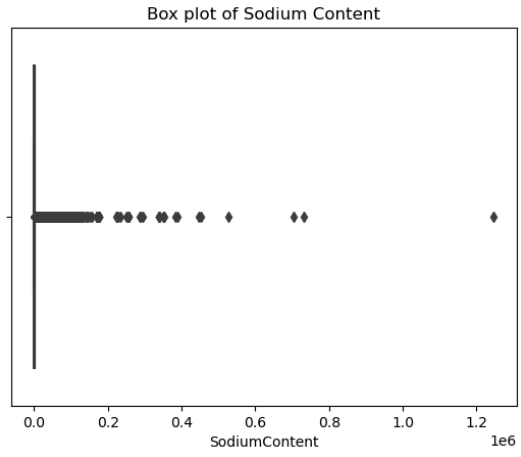
1. **Introduction:** This system is designed for everyone who opts for cooking at home, more beneficial for those with busy schedules.This system aims to utilize new recipes tailored to tastes and dietary preferences by accessing personalized suggestions to enhance the cooking experience.

2. **Data Collection:** The .csv file was accessed through kaggle. The key data points include recipe names, ingredients, cooking times, user ratings, and Nutritional information.

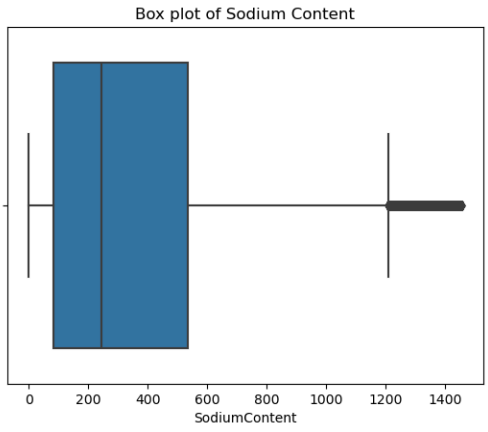
3. **Data Analysis with visualization**:

The first thing we did was identify outliers, and removing them, the following charts show the data before outliers were removed and after removal:

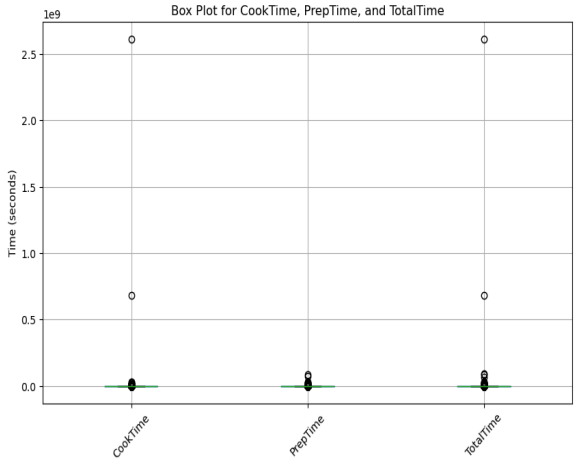
Original Sodium Content:



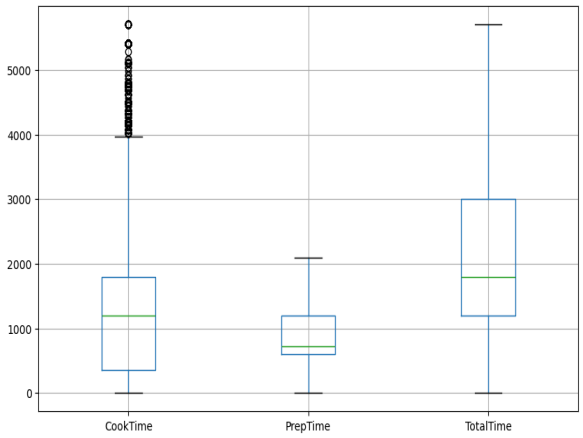
Sodium Content after Removing outliers::



Original Cooking Times:

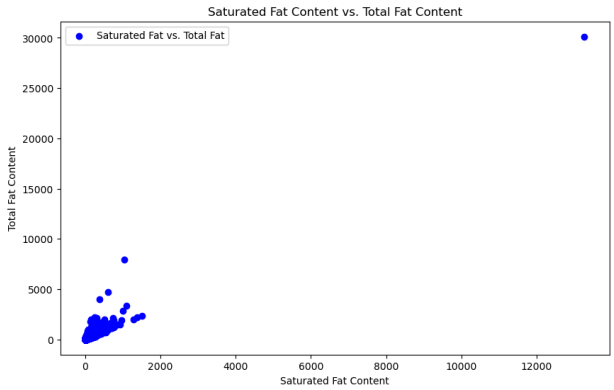


Cooking Times after Removing outliers:

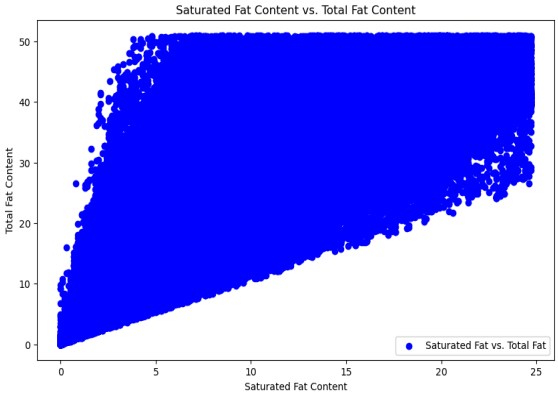


Relationship between TotalFat, Saturated Fat:

Original:



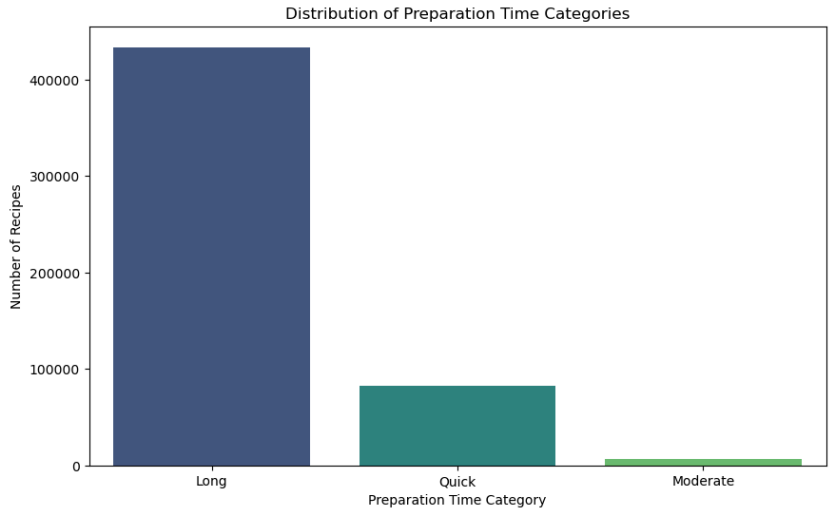
After removing outliers:



Techniques: Relationships between each category was analyzed.

No correlation between the nutritional properties vs. ratings was found.

The Distribution of CookingTime was visualized:



Aggregated Ratings vs. CookTime was evaluated, and no correlation was distinguished.

The following features were created:

1. An algorithm for nutritional features such as dairy-free, gluten-free, low-carb', 'vegetarian".
2. Cuisine type was also categorized to: Italian, Mexican, Chinese, Indian, Japanese, Thai, Persian, American, Others.

```
•[69]: #Testing the feature:
indian_recipes = df[df['CuisineType'] == 'Indian']
print(indian_recipes)
```

```
        RecipeId                              Name    AuthorId  CookTime  \
58           159                     Chicken Curry      148316    2520.0
94           236                  Chicken Curry II        1597       1.0
321          675                Curried Chicken II        1543       1.0
605         2490                    Cucumber Raita        1533       1.0
684         2673          West Indian Bread Pudding        1549       1.0
...          ...                               ...         ...       ...
324980    540873  Charishma's Gur Ki Roti With Khoya        6357    2100.0
325020    540939                 Chettinad Chicken       78626    1800.0
325047    540977     INDIAN BASMATI With DRY FRUITS  2001004241    1800.0
325143    541143         Instant Rava Dhokla Recipe  2002835253     120.0
325260    541356      Masala Maggi Noodles in a Mug  2002835253     240.0

        PrepTime  TotalTime  \
58          3900       6420
94          3600       3600
321         3300       3300
605            0          0
```

3. Categorizing easy vs. difficult recipes based on cooking time.

```
# Display the first few rows of the DataFrame to see the new column
print(df[['Name', 'TotalTime', 'Difficulty']].head())
```

```
                                 Name  TotalTime Difficulty
0          Low-Fat Berry Blue Frozen Dessert      89100  Difficult
1                         Cabbage Soup       3000     Medium
2  Buttermilk Pie With Gingersnap Crumb Crust       4800     Medium
3                  A Jad - Cucumber Pickle       1500       Easy
4                     Butter Pecan Cookies       3840     Medium
```

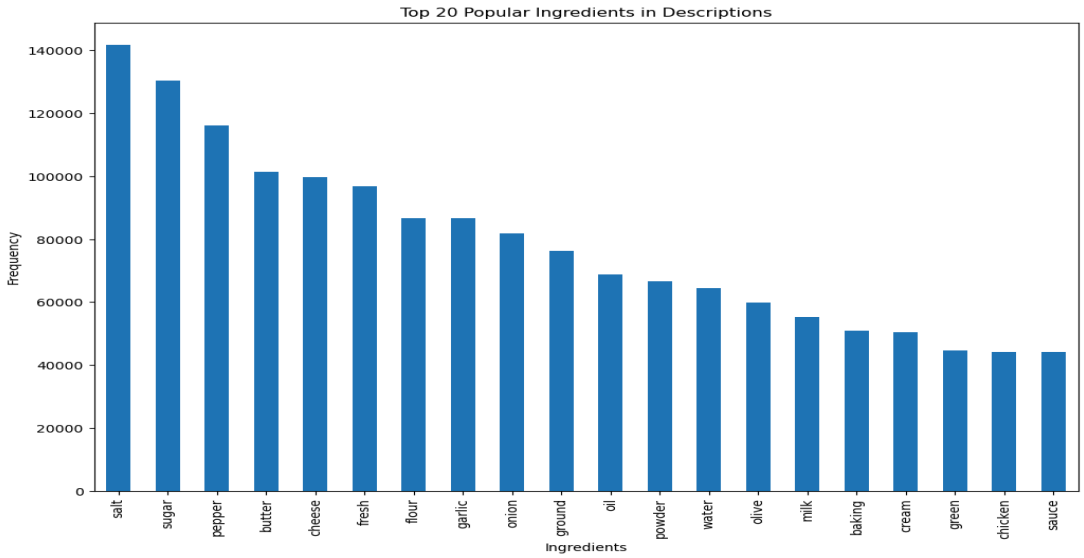
4. Categorized meat, seafood and vegetarian meals.

```
print(df[['Name','MealType']].head(-10))
```

```
                                        Name    MealType
0                Low-Fat Berry Blue Frozen Dessert  Vegetarian
1                                   Cabbage Soup  Vegetarian
2         Buttermilk Pie With Gingersnap Crumb Crust  Vegetarian
3                           A Jad - Cucumber Pickle  Vegetarian
4                              Butter Pecan Cookies  Vegetarian
...                                             ...         ...
325259    Chicken Pot Pie with Mashed Potato Crust        Meat
325260               Masala Maggi Noodles in a Mug  Vegetarian
325261                     Chocolate Rum Snowballs  Vegetarian
325262             Cookie Cutter Shortbread Hearts  Vegetarian
325263                11-Minute Microwave Caramels  Vegetarian

[325264 rows x 2 columns]
```

5. 20 popular ingredients:



Models:
Three models were created: K-Nearest Neighbor - similarity based on features, Ingredient based features, model Based on reviews.

Future Improvements: To enhance the recommendation system, further machine learning needs to be applied to incorporate user feedback and rating. The dataset needs to be expanded, to include more diverse cuisine and more features can be created based on both: new data and user feedback. Lastly, refine the algorithms for better accuracy.

Summary: “Our project successfully demonstrates the potential of data-driven recipe recommendations. By leveraging user data and advanced analysis techniques, we can provide personalized suggestions that cater to individual tastes and preferences.”
Impact: This recommendation system can improve the user experience, making it easier for people to access and learn new recipes based on their unique preferences.