Can we diet at McDonald's?

Rakshika S
Computer Science and Engineering
PES University

Bengaluru, Karnataka, India.
rakshika.prasad@gmail.com

Shravya U
Computer Science and Engineering
PES University

Bengaluru, Karnataka, India.
shravya0408@gmail.com

Abstract— ***McDonald's is one of the best fast food restaurants in the world which is of course very quality guaranteed. Unfortunately, the image of fast food that seems not good for a weight loss diet actually makes us reluctant and worried that it will interfere with our diet. We must learn the information on the nutritional content of each menu that is right to choose while helping our daily needs. Therefore, this document explains the way to recommend the best menu that we can eat at McDonald's with a deeper data approach. Even with this, McDonald's which is classified as fast food can become a reliable favourite place for weight loss diets.***

Keywords— ***McDonald's, fast food, diet, nutrition***

I. Introduction of the Dataset

This dataset provides nutrition facts of every menu item on the Indian McDonald's menu. The menu items and nutrition facts were scraped from the McDonald's website.
Menu Category = The category for each menu. There are Regular, Breakfast, McCafe, Desserts, Gourmet, Beverages, and Condiments Menu.
Menu Items = The menu items that be consumed.
Per Serve Size = The menu standard amount for each serving. It can be measured by either grams (g) or milliliter (mL).
Energy (kCal) = The nutrition unit that measures energy by kCal.
Protein (g) = Helps increase satiety, which is beneficial or weight loss.
Total fat (g) = Helps feel full and can protect against heart disease.
Sat fat (g) = It can increase bad cholesterol and triglycerides, increasing the risk for heart disease. (although it don't need to be avoided entirely)
Trans fat (g) = Artificially turned into saturated fats and increase heart disease and stroke risk by raising bad cholesterol and decreasing good cholesterol.
Cholesterols (mg) = Helps build cells and produce certain hormones, but it can cause artery-clogging deposits if eating too many saturated and trans fats.
Total carbohydrate (g) = The body's preferred energy source and fuel vital organs.
Total Sugars (g) = Consists of natural sugars and added sugars.
Added Sugars (g) = It can affect feelings of hunger and fullness less significantly.
Sodium (mg) = Helps lose water weight, but it can contribute to fluid retention if too much eating it.

II. Impact of McDonald's on Health

McDonald's is an indulgence that most of us find hard to resist, so we enjoy it from time to time. But with fast-food chains gaining even more popularity, eating at McDonald's has become an everyday habit for many.
With craveable new menu items and value deals being introduced all the time, it isn't hard to see why the chain has such an appeal, and why it's easy to fall into the trap of enjoying its meal combos every day. After all, it's a familiar, cheap, and delicious option.
But if you're feeding yourself or your family at McDonald's every time you need a quick, convenient lunch, we urge you to consider the devastating consequences this could have on your body.

III. Problem Statement

Using this dataset 'McDonald's India : Menu Nutrition' we will be analysing the nutrition of each dish in the menu. A healthy menu will be suggested based on the diet. By solving this problem statement, we will find out if McDonald's menu is good enough for us to diet.

IV. Approach to Solve

This problem will be solved using the Python programming language. The dataset first has to be checked if there are missing values and pre-process it. The dataset will then be analysed by with the explanatory data analysis and data visualisations. Then feature engineering will be done to choose the attributes that are required by us to solve the problem statement. EDA will be done again to understand the dataset completely. We will then build a recommendation model that suggests a menu for dieters who have an energy target of 1500 kCal a day to eat at McDonald's.

V. ANALYSIS

1)Outlier analysis:

Boxplot for Energy (kCal):

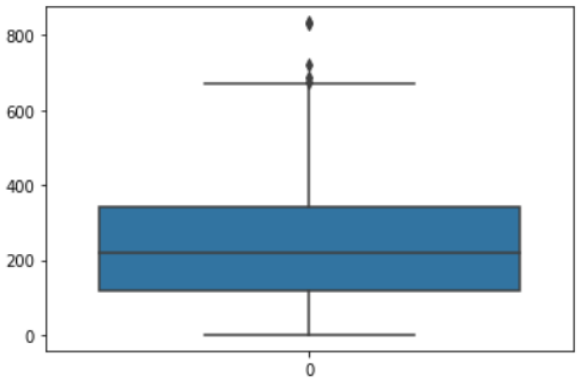

Fig1

Boxplot for Protein (g):

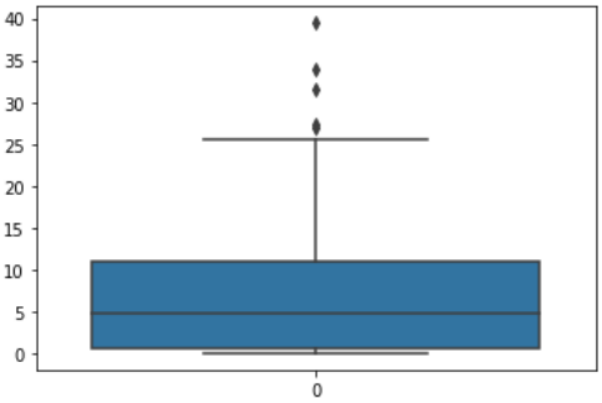

Fig2

Boxplot for Total fat (g):

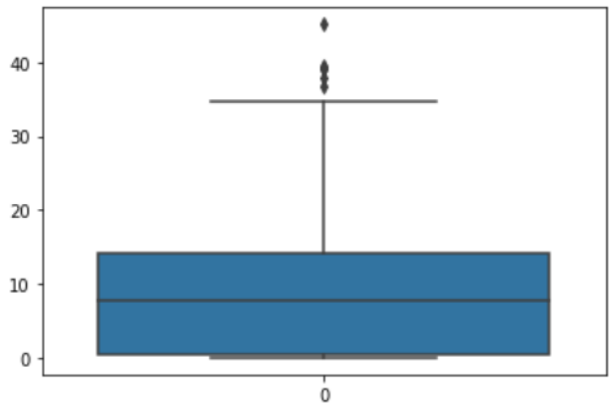

Fig3

Boxplot for Sat Fat (g):

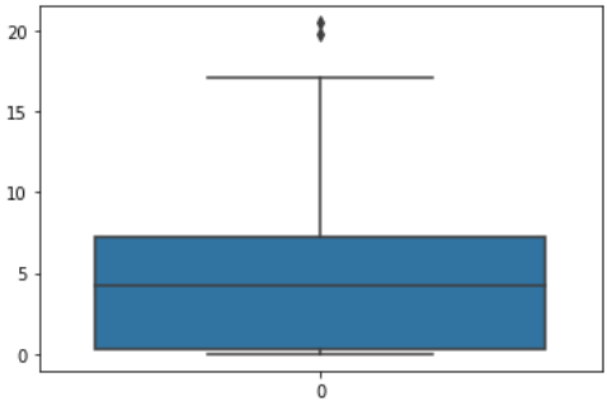

Fig4

Boxplot for Trans fat (g):

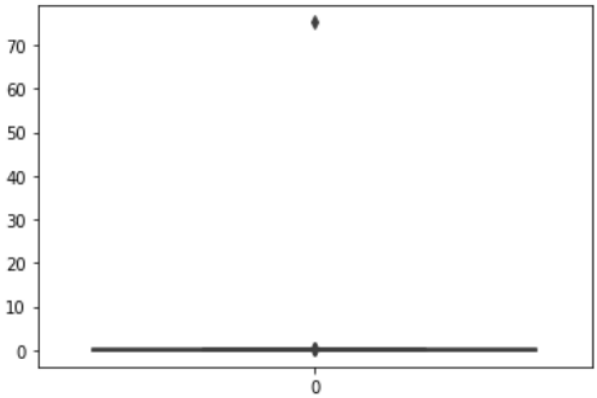

Fig5

Boxplot for Cholesterols (mg):

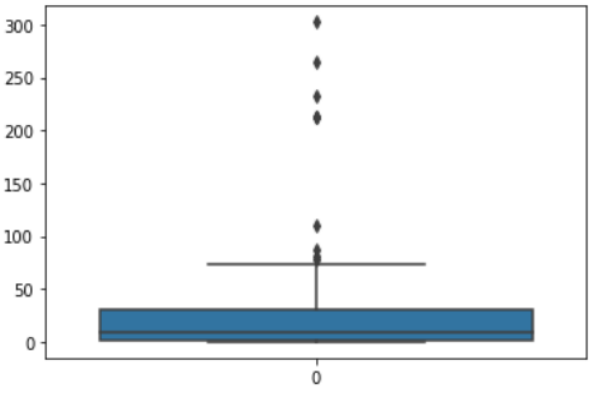

Fig6

As we can see in the boxplot, there are outliers in the attributes Energy (kCal) Protein (g) Total fat (g) Sat Fat (g) Trans-fat (g) Cholesterols (mg) Total carbohydrate (g) Total Sugars (g) Added Sugars (g) Sodium (mg).

2)Correlation between the attributes:

Heatmap:

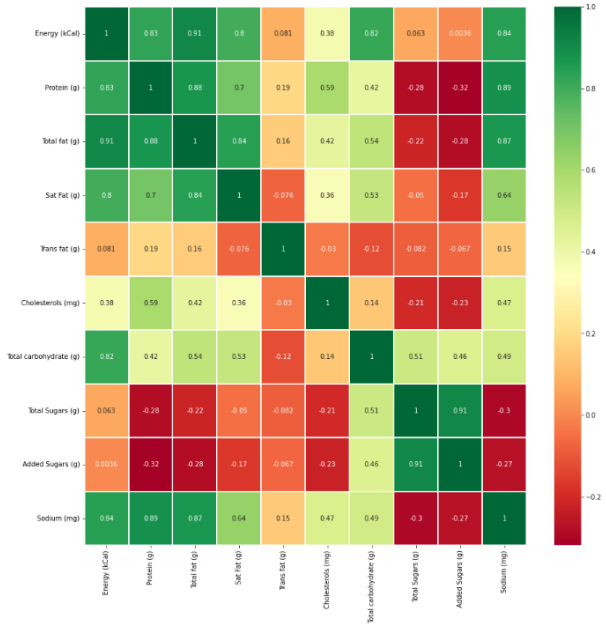

Fig7

There is strong negative correlation between:

a)Added sugars and Protein.

b)Total sugars and Protein.

Strong positive correlation between:

a)Total fat and Energy

b)Protein and Sodium

c)Sat fat and Total fat

3)Line plot for comparing different Fat in Menu:

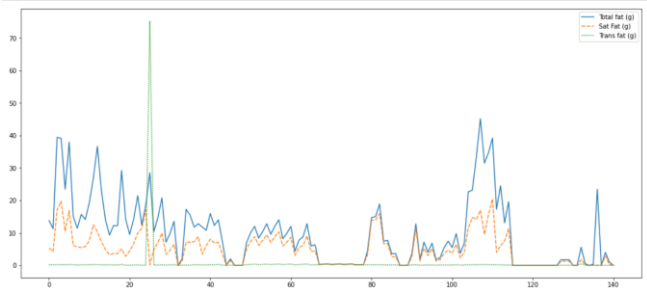

Fig8

4)Line plot for comparing total Fat & Sat Fat in Menu:

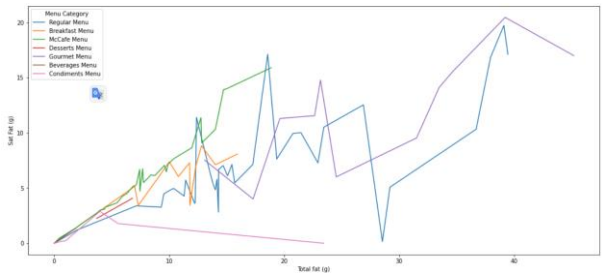

Fig9

5) Line plot for comparing Total Fat & Trans Fat in Menu:

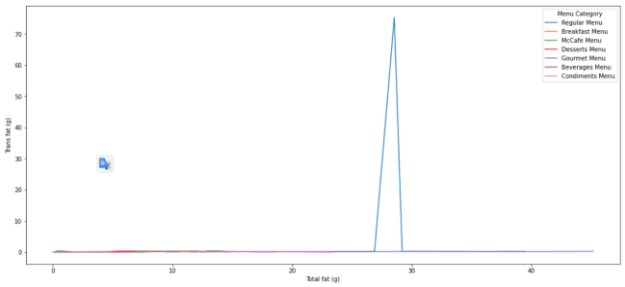

Fig10

As we can see that the amount of Trans Fat is very high is Regular Meal

6) Line plot for comparing Sodium & Total Fat in Menu:

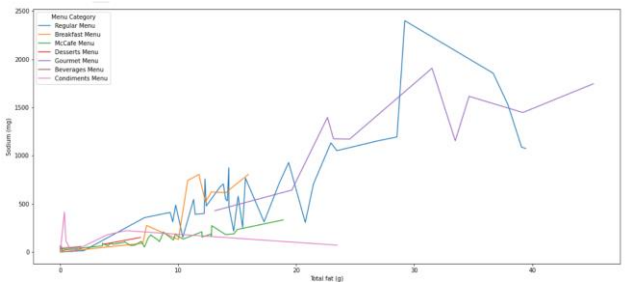

Fig11

7) Histogram for Cholesterols (mg) vs Total fat (g):

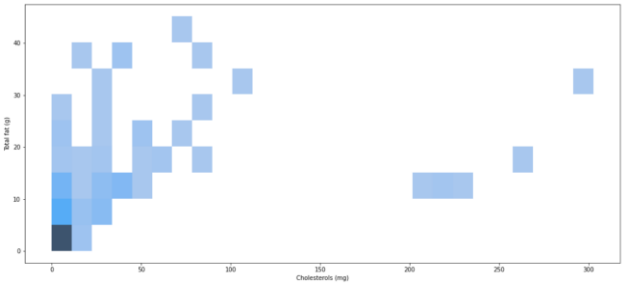

Fig12

VI. Conclusion

Of course, this menu recommendation is perfect for dieters who have an energy target of 1500 kCal a day to eat at McDonald's, especially those in Mumbai. Not only to launch a weight loss diet, this will also fill the stomach with enough energy so that daily activities are not disturbed. However, this result is not absolutely accurate because the combined menu of food, drink, and condiment may not match each other.

Here are things we can propose to be better in the future in this notebook.

1. If there are additional nutrients such as Vitamins, Calcium, Iron, etc., of course, more exploration and analysis will be carried out in the dataset for dietary needs.

2. This can be used as a food recommendation application at McDonald's in real time by paying attention to energy calories, the % Daily Value range, as well as certain nutrients needed.

References

[1]
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