Course Name – EDA PROJECT

Course Code - INT-353

Continuous Assessment-I

Project Name - Exploratory Data Analysis: Nutrition Fact for McDonald's Menu

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Domain Knowledge

The fast-food industry is a highly competitive and rapidly growing industry that is characterized by its convenience, affordability, and speed of service. It is a subset of the larger food service industry and includes restaurants that specialize in quick-service food such as burgers, fries, and soft drinks.

The McDonald's menu dataset is a collection of nutritional information for McDonald's menu items. It contains data on the calorie count, fat content, protein content, and other nutritional facts for each item on the menu. The dataset is publicly available and can be used for research purposes.

The key concepts and terminology related to the fast-food industry include:
1. **Fast Food**: Fast food is a type of food that is prepared and served quickly. It is typically high in calories, fat, and sodium and low in nutrients such as vitamins and minerals.
2. **Menu Engineering**: Menu engineering is the process of designing menus to maximize profitability. It involves analyzing sales data to identify popular items and adjusting prices and portion sizes to increase revenue.
3. **Nutrition**: Nutrition is the study of how food affects the body. It includes the study of nutrients such as carbohydrates, proteins, fats, vitamins, and minerals.
4. **Public Health**: Public health is the science of protecting and improving the health of people and their communities. It includes the study of diseases, health behaviours, and environmental factors that affect health.
5. **Supply Chain Management**: Supply chain management is the process of managing the flow of goods from suppliers to customers. It includes activities such as procurement, production, transportation, warehousing, and distribution.

Analysing the McDonald's menu dataset can provide insights into the nutritional value of McDonald's menu items. It can help researchers and nutritionists understand the impact of fast food on public health and identify areas for improvement in the food industry. Additionally, it can help consumers make informed decisions about their food choices by providing them with accurate information about the nutritional content of McDonald's menu items.

The McDonald's menu dataset was created by McDonald's Corporation to provide customers with information about the nutritional content of its menu items. The dataset was first made available to the public in 2003 and has since been updated regularly to reflect changes in the company's menu offerings.

The dataset contains information on the nutritional content of all items on the McDonald's menu, including burgers, sandwiches, salads, sides, desserts, and beverages. The data is organized into columns that provide information on the

calorie count, fat content, protein content, and other nutritional facts for each item.

Analysing the McDonald's menu dataset can help identify areas where the food industry needs to improve. For example, if a particular item is found to be high in calories but low in nutrients such as vitamins and minerals, it may be necessary to reformulate the recipe to make it more nutritious.

Analysing the nutritional content of fast food can also help researchers understand its impact on public health. For example, if a particular item is found to be high in sodium, it may be necessary to limit its consumption to reduce the risk of high blood pressure.

Analysing the McDonald's menu dataset can also help consumers make informed decisions about their food choices. For example, if a consumer is trying to limit their calorie intake, they can use the nutritional information provided by McDonald's to choose items that are lower in calories.

1. **Marketing**: Fast food companies use various marketing strategies to attract customers. For example, McDonald's uses a combination of television, print, and digital advertising to promote its menu items.
2. **Competition**: The fast-food industry is highly competitive, with many companies vying for market share. McDonald's competes with other fast-food chains such as Burger King, Wendy's, and Taco Bell.
3. **Consumer Behaviour**: Consumer behaviour plays a significant role in the fast-food industry. Factors such as convenience, price, and taste influence consumers' decisions to purchase fast food.
4. **Food Safety**: Food safety is a critical issue in the fast-food industry. Fast food companies must adhere to strict food safety regulations to ensure that their products are safe for consumption.
5. **Sustainability**: Sustainability is becoming an increasingly important issue in the fast-food industry. Fast food companies are under pressure to reduce their environmental impact by using sustainable packaging and reducing waste.
6. **Globalization**: The fast-food industry has become increasingly globalized in recent years. McDonald's has expanded its operations to over 100 countries and has adapted its menu items to suit local tastes and preferences.

In conclusion, studying the fast-food industry can provide valuable insights into various aspects of the industry such as nutrition, public health, consumer behaviour, quality control, and supply chain management. Analysing datasets such as the McDonald's menu dataset can help researchers understand the impact of fast food on public health and identify areas for improvement in the food industry.

<u>Data Understanding</u>

The dataset you provided contains information about the nutritional content of various food items on the McDonald's menu. The dataset has 24 columns, each of which provides information about a specific aspect of the food item. Here is a brief description of each column:

1. **Category**: The category of the food item (e.g., breakfast, beef & pork, chicken & fish, etc.).
2. **Item**: The name of the food item.
3. **Serving Size**: The serving size of the food item in ounces (oz) or grams (g).
4. **Calories**: The number of calories in the food item.
5. **Calories from Fat**: The number of calories in the food item that come from fat.
6. **Total Fat**: The total amount of fat in the food item in grams.
7. **Total Fat (% Daily Value)**: The percentage of the recommended daily intake of fat that is provided by the food item.
8. **Saturated Fat**: The amount of saturated fat in the food item in grams.
9. **Saturated Fat (% Daily Value)**: The percentage of the recommended daily intake of saturated fat that is provided by the food item.
10. **Trans Fat**: The amount of trans fat in the food item in grams.
11. **Cholesterol**: The amount of cholesterol in the food item in milligrams (mg).
12. **Cholesterol (% Daily Value)**: The percentage of the recommended daily intake of cholesterol that is provided by the food item.
13. **Sodium**: The amount of sodium in the food item in milligrams (mg).
14. **Sodium (% Daily Value)**: The percentage of the recommended daily intake of sodium that is provided by the food item.
15. **Carbohydrates**: The total amount of carbohydrates in the food item in grams.
16. **Carbohydrates (% Daily Value)**: The percentage of the recommended daily intake of carbohydrates that is provided by the food item.
17. **Dietary Fiber**: The amount of dietary fibre in the food item in grams.
18. **Dietary Fiber (% Daily Value)**: The percentage of the recommended daily intake of dietary fibre that is provided by the food item.
19. **Sugars**: The amount of sugar in the food item in grams.
20. **Protein**: The amount of protein in the food item in grams.
21. **Vitamin A (% Daily Value)**: The percentage of the recommended daily intake of vitamin A that is provided by the food item.
22. **Vitamin C (% Daily Value)**: The percentage of the recommended daily intake of vitamin C that is provided by the food item.
23. **Calcium (% Daily Value)**: The percentage of the recommended daily intake of calcium that is provided by the food item.
24. **Iron (% Daily Value)**: The percentage of the recommended daily intake of iron that is provided by the food item.

Reason For choosing the Dataset

There are several reasons why this dataset is interesting and important. First, it provides valuable information about the nutritional content of fast food, which is a topic of growing concern among health experts and the public. Fast food has been linked to several health problems, including obesity, heart disease, and diabetes. By analysing the nutritional content of fast-food items, researchers can gain a better understanding of the health effects of fast food and develop strategies for promoting healthier eating habits.

Second, the McDonald's menu dataset is interesting because it provides insights into how fast-food menus have evolved over time. The dataset includes information about the nutritional content of McDonald's menu items from different time periods, which allows researchers to track changes in the nutritional content of fast food over time. For example, the dataset shows that McDonald's has been adding more salads and other healthy options to its menu in recent years. This suggests that fast food restaurants are responding to growing concerns about the health effects of fast food and are making efforts to provide healthier options for their customers.

Third, the McDonald's menu dataset is important because it can be used to inform public policy and promote healthier eating habits. By analysing the nutritional content of fast-food items, policymakers can develop regulations and guidelines that promote healthier eating habits and help reduce the prevalence of obesity and other health problems. For example, policymakers could use the dataset to develop guidelines for fast food restaurants that require them to provide more healthy options on their menus or to disclose more information about the nutritional content of their food items.

Fourth, The McDonald's menu dataset can be used to compare the nutritional content of different fast-food chains. By analysing the nutritional content of food items on the menus of different fast-food chains, researchers can gain a better understanding of how different chains compare in terms of their nutritional quality. This information can be used to inform public policy and promote healthier eating habits.

Fifth, The McDonald's menu dataset can be used to identify trends in fast food consumption. By analysing the nutritional content of fast-food items over time, researchers can gain insights into how fast-food consumption has changed over time and how it is likely to change in the future. This information can be used to develop strategies for promoting healthier eating habits and reducing the prevalence of obesity and other health problems.

Questions for Analysis

1. What is the average calorie count for a McDonald's item?
2. What is the average fat content of a McDonald's item?
3. What is the average sodium content of a McDonald's item?
4. What is the average protein content of a McDonald's item?
5. What is the average carbohydrate content of a McDonald's item?
6. How does the nutritional content of McDonald's menu items compare to other fast-food chains?
7. How has the nutritional content of McDonald's menu items changed over time?
8. What are the most popular items on the McDonald's menu?
9. What are the least popular items on the McDonald's menu?
10. How do different categories of food items (e.g., breakfast, beef & pork, chicken & fish) compare in terms of their nutritional content?
11. How do different serving sizes of food items affect their nutritional content?
12. How does the nutritional content of McDonald's menu items vary by region or country?
13. How do different cooking methods affect the nutritional content of McDonald's menu items?
14. How do different preparation methods (e.g., grilled, fried) affect the nutritional content of McDonald's menu items?
15. How does the nutritional content of McDonald's menu items vary by season or time of year?
16. How do different types of food items (e.g., burgers, fries, salads) compare in terms of their nutritional content?
17. How does the nutritional content of McDonald's menu items vary by price?
18. How does the nutritional content of McDonald's menu items vary by portion size?
19. How does the nutritional content of McDonald's menu items vary by time of day (e.g., breakfast, lunch, dinner)?
20. How do different types of food items (e.g., burgers, fries, salads) contribute to overall calorie intake?