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Analysis of Fast-Food Nutritional Content with SQL and Python Visualization

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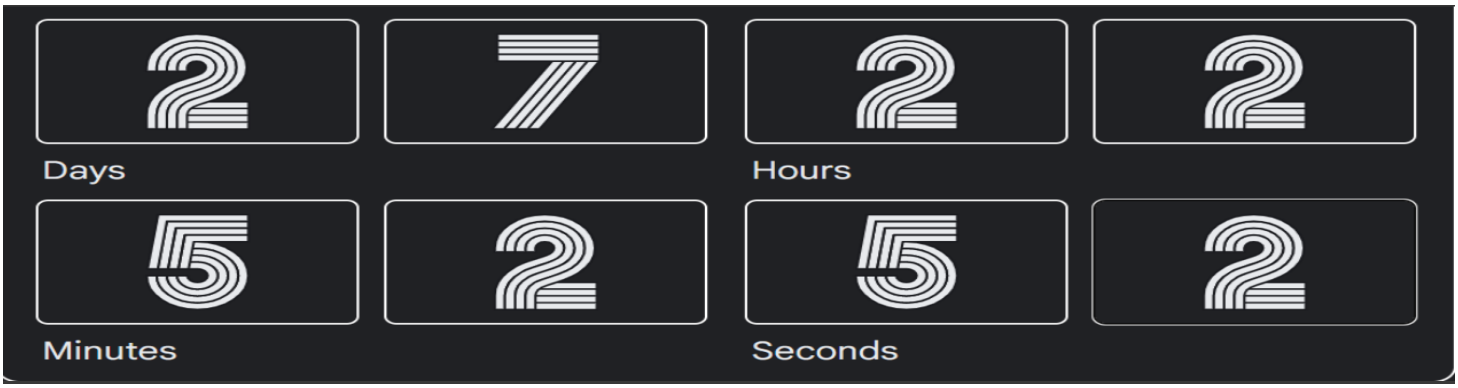

About the Dataset

Welcome to the Fast-Food Nutrition Dataset, which provides a comprehensive breakdown of the nutritional content of various fast-food products from popular fast-food chains.
Fast food is known for its convenience and affordability, but it is also infamous for its high-calorie, high-fat, and high-sugar content. This dataset aims to shed light on the nutritional value of these fast-food products, helping consumers make more informed decisions about their food choices.
With information on calories, fat, carbohydrates, protein, and other key nutrients, this dataset provides a valuable resource for nutritionists, researchers, and health-conscious individuals. By analyzing this dataset, we can gain a better understanding of the nutritional impact of fast-food consumption and work towards creating healthier food options in the fast-food industry.
Data Source: https://www.kaggle.com/datasets/ulrikthygepedersen/fastfood-nutrition

Daily Requirements of Nutrition (Information)

- **Calories:** 2000-2500 kcal/day for men, and 1600-2000 kcal/day for women.
- **Protein:** 0.8-1.0 g/kg of body weight/day.
- **Carbohydrates:** 45-65% of total daily calories, or at least 130 g/day.
- **Fat:** 20-35% of total daily calories, or at least 20-35 g/day.
- **Fiber:** 25-38 g/day for men, and 21-25 g/day for women.
- **Vitamins:** the RDI varies depending on the vitamin, ranging from a few micrograms to several milligrams or more per day.
- **Minerals:** the RDI also varies depending on the mineral, ranging from a few milligrams to several grams per day.
- **Vitamin A:** RDI is 900 micrograms (mcg) per day for men and 700 mcg per day for women.
- **Vitamin C:** RDI is 90 milligrams (mg) per day for men and 75 mg per day for women.
- **Cholesterol:** less than 300 milligrams per day for most adults, and less than 200 milligrams per day for individuals with heart disease or high blood cholesterol levels.
- **Sodium:** less than 2,300 milligrams per day for most adults, and less than 1,500 milligrams per day for individuals with high blood pressure, kidney disease, or other health conditions.
- **Sugar:** The American Heart Association recommends limiting added sugar intake to no more than 6 teaspoons (25 grams) per day for women and 9 teaspoons (38 grams) per day for men.
- **Calcium:** the recommended daily intake varies depending on age and sex, but generally ranges from 1,000 to 1,300 milligrams per day for adults.

A Brief Overview of each Variable and its General Effects on Health:

Calories: Calories are a measure of the energy content of food. Consuming too many calories can lead to weight gain and an increased risk of chronic diseases such as type 2 diabetes, heart disease, and certain cancers. However, it's important to note that the total number of calories consumed is just one factor in overall health, and the quality of those calories is also important.

Total fat: Consuming too much total fat can also lead to weight gain and an increased risk of chronic diseases. However, as mentioned above, some types of fat are considered healthy when consumed in moderation.

Saturated fat: Saturated fat is generally considered less healthy than unsaturated fat, as it can increase LDL (bad) cholesterol levels and increase the risk of heart disease. However, recent research has questioned the link between saturated fat and heart disease.

Trans fat: Trans fats are considered the unhealthiest type of fat, as they not only increase LDL cholesterol levels but also decrease HDL (good) cholesterol levels. Trans fats are often found in processed foods and should be avoided.

Cholesterol: Dietary cholesterol can increase blood cholesterol levels, which can increase the risk of heart disease. However, the impact of dietary cholesterol on heart health is not as clear-cut as it once was thought to be.

Sodium: Consuming too much sodium can increase blood pressure and increase the risk of heart disease and stroke. The recommended daily intake of sodium is no more than 2,300 milligrams (mg), or even less if you have certain health conditions.

Carbohydrates: Carbohydrates provide the body with energy but consuming too many refined carbohydrates (such as sugar and white flour) can lead to weight gain and an increased risk of chronic diseases.

Fiber: Fiber is important for digestive health and can help lower cholesterol levels and improve blood sugar control. Most people don't consume enough fiber in their diet.

Sugar: Consuming too much sugar can lead to weight gain and an increased risk of chronic diseases such as type 2 diabetes and heart disease.

Protein: Protein is important for building and repairing tissues in the body. Consuming too much protein can lead to weight gain, while not consuming enough can lead to muscle loss.

Vitamin A: Vitamin A is important for vision, immune function, and skin health.

Vitamin C: Vitamin C is important for immune function, skin health, and wound healing.

Calcium: Calcium is important for bone health and muscle function.

Salad: Salads are generally considered a healthy food choice, as they are often low in calories and high in fiber and other nutrients. However, the nutritional content of a salad varies widely depending on the ingredients and dressings used.

Data Source: https://www.kaggle.com/datasets/ulrikthygepedersen/fastfood-nutrition

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Section I: Data Overview

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[1]: The top 10 rows of the Dataset for the Analysis

```
SELECT Top 10 * FROM fastfood;
```

100 %

Results | Messages

	ID	Restaurant	Menu	Calories	CaloriesFat	TotalFat	Saturated_Fat	TransFat	Cholesterol	Sodium	Carbohydrates	Fiber	Sugar	Protein	Vitami0	VitaminC	Calcium	Salad
1	1	Mcdo0lds	Artisan Grilled Chicken Sandwich	380	60	7	2	00:00:00.0000000	95	1110	44	03:00:00.0000000	11	37	4	20	20	0
2	2	Mcdo0lds	Single Bacon Smokehouse Burger	840	410	45	17	01:50:00.0000000	130	1580	62	02:00:00.0000000	18	46	6	20	20	0
3	3	Mcdo0lds	Double Bacon Smokehouse Burger	1130	600	67	27	03:00:00.0000000	220	1920	63	03:00:00.0000000	18	70	10	20	50	0
4	4	Mcdo0lds	Grilled Bacon Smokehouse Chicken Sandwich	750	280	31	10	00:50:00.0000000	155	1940	62	02:00:00.0000000	18	55	6	25	20	0
5	5	Mcdo0lds	Crispy Bacon Smokehouse Chicken Sandwich	920	410	45	12	00:50:00.0000000	120	1980	81	04:00:00.0000000	18	46	6	20	20	0
6	6	Mcdo0lds	Big Mac	540	250	28	10	01:00:00.0000000	80	950	46	03:00:00.0000000	9	25	10	2	15	0
7	7	Mcdo0lds	Cheeseburger	300	100	12	5	00:50:00.0000000	40	680	33	02:00:00.0000000	7	15	10	2	10	0
8	8	Mcdo0lds	Classic Chicken Sandwich	510	210	24	4	00:00:00.0000000	65	1040	49	03:00:00.0000000	6	25	0	4	2	0
9	9	Mcdo0lds	Double Cheeseburger	430	190	21	11	01:00:00.0000000	85	1040	35	02:00:00.0000000	7	25	20	4	15	0
10	10	Mcdo0lds	Double Quarter Pounder® with Cheese	770	400	45	21	02:50:00.0000000	175	1290	42	03:00:00.0000000	10	51	20	6	20	0

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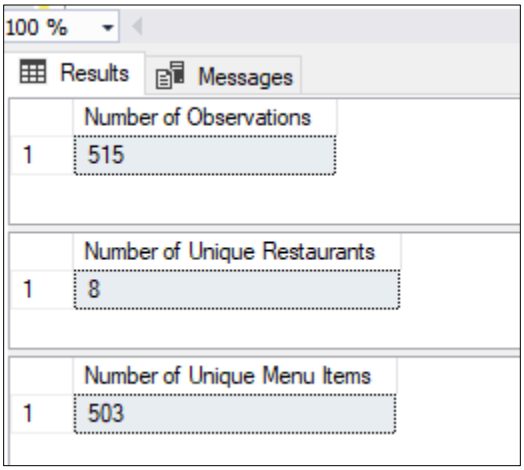
[2]: How many rows, unique Restaurants and unique Menu Items are in the dataset?

```
SELECT COUNT(*) [Number of Observations]
FROM fastfood;
       (SELECT COUNT(DISTINCT(Restaurant)) [Number of Unique Restaurants]
       FROM fastfood);
SELECT COUNT(DISTINCT(Menu)) [Number of Unique Menu Items]
FROM fastfood;
```



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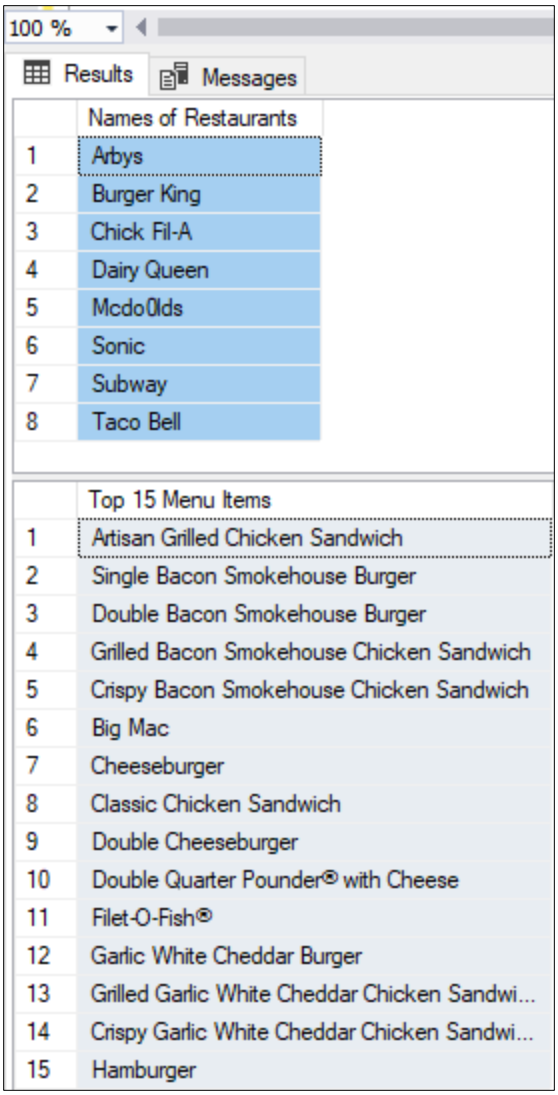
[2b]: What are the names of the Restaurants; list the top 15 Menu items produced by these Restaurants?

```
SELECT DISTINCT(Restaurant) AS [Names of Restaurants]
FROM fastfood;
SELECT Top 15 Menu AS [Top 15 Menu Items]
FROM fastfood;
```



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Results | Messages

	Names of Restaurants
1	Arbys
2	Burger King
3	Chick Fil-A
4	Dairy Queen
5	Mcdo0lds
6	Sonic
7	Subway
8	Taco Bell

	Top 15 Menu Items
1	Artisan Grilled Chicken Sandwich
2	Single Bacon Smokehouse Burger
3	Double Bacon Smokehouse Burger
4	Grilled Bacon Smokehouse Chicken Sandwich
5	Crispy Bacon Smokehouse Chicken Sandwich
6	Big Mac
7	Cheeseburger
8	Classic Chicken Sandwich
9	Double Cheeseburger
10	Double Quarter Pounder® with Cheese
11	Filet-O-Fish®
12	Garlic White Cheddar Burger
13	Grilled Garlic White Cheddar Chicken Sandwi...
14	Crispy Garlic White Cheddar Chicken Sandwi...
15	Hamburger

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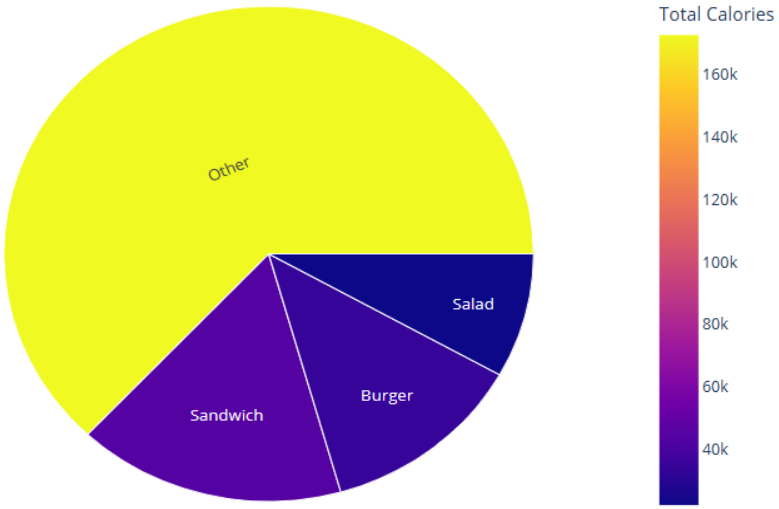
[2c]: What is the change in total calories across different types of menu items (e.g., burgers, sandwiches, salads):

```
SELECT [Menu Type], SUM(Calories) AS [Total Calories],
RANK() OVER (ORDER BY SUM(Calories) DESC) AS Rank
FROM (
  SELECT
    Menu,
    CASE
      WHEN Menu LIKE '%burger%' THEN 'Burger'
      WHEN Menu LIKE '%sandwich%' THEN 'Sandwich'
      WHEN Menu LIKE '%salad%' THEN 'Salad'
      ELSE 'Other'
    END AS [Menu Type],
    Calories
  FROM fastfood
) AS MenuTypeCalories
GROUP BY [Menu Type]
ORDER BY Rank;
```

100 %

Results | Messages

	Menu Type	Total Calories	Rank
1	Other	172300	1
2	Sandwich	44760	2
3	Burger	34150	3
4	Salad	22210	4



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[2d]: What are the menu items that meet different nutritional criteria (e.g., low-fat, low-sugar)?

```
SELECT
  SUM(CASE WHEN TotalFat <= 10 THEN 1 ELSE 0 END) AS LowFat,
  SUM(CASE WHEN Sugar <= 5 THEN 1 ELSE 0 END) AS LowSugar,
  SUM(CASE WHEN Protein >= 20 THEN 1 ELSE 0 END) AS HighProtein
FROM fastfood;
```

100 %

Results | Messages

	LowFat	LowSugar	HighProtein
1	82	227	330

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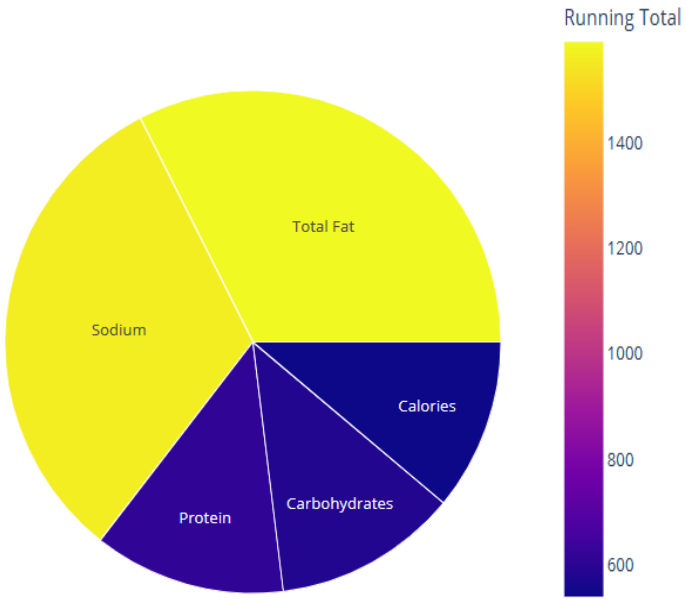
[2e]: What is the breakdown of calories for specific menu items, such as “Big Mac’ in terms of Calories, Total Fat, Protein, etc.?

```
WITH calories_breakdown AS (
  SELECT
    'Calories' AS nutrient, Calories AS value
  FROM fastfood
  WHERE Menu = 'Big Mac'
  UNION ALL
  SELECT
    'Total Fat' AS nutrient, TotalFat AS value
  FROM fastfood
  WHERE Menu = 'Big Mac'
  UNION ALL
  SELECT
    'Protein' AS nutrient, Protein AS value
  FROM fastfood
  WHERE Menu = 'Big Mac'
  UNION ALL
  SELECT
    'Carbohydrates' AS nutrient, Carbohydrates AS value
  FROM fastfood
  WHERE Menu = 'Big Mac'
  UNION ALL
  SELECT
    'Sodium' AS nutrient, Sodium AS value
  FROM fastfood
  WHERE Menu = 'Big Mac'
)
SELECT
  nutrient,
 SUM(value) OVER (ORDER BY nutrient) AS [Running Total]
FROM calories_breakdown;
```

100 %

Results | Messages

	nutrient	Running Total
1	Calories	540
2	Carbohydrates	586
3	Protein	611
4	Sodium	1561
5	Total Fat	1589



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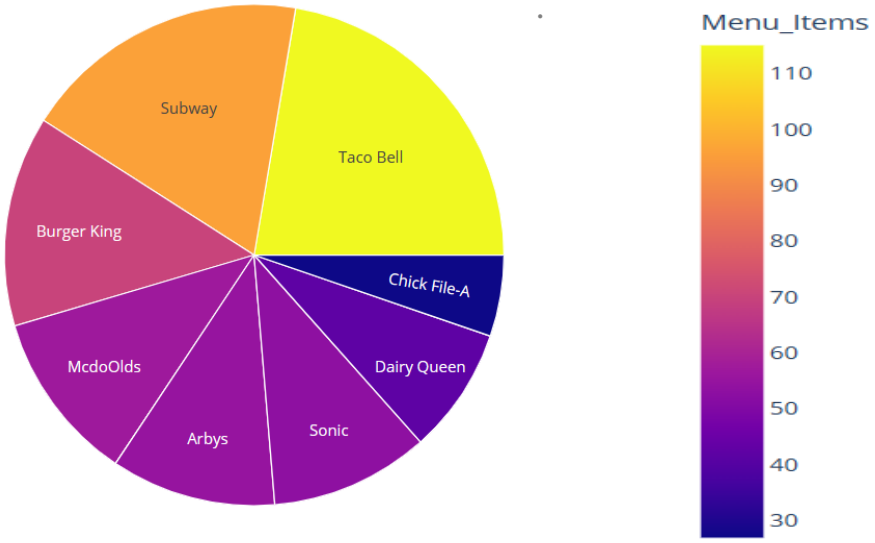
[3]: How many menu items are produced in each Restaurant?

```
SELECT Restaurant, COUNT(*) as [Number of Menu items],
RANK() OVER (ORDER BY Count(Menu) DESC) AS Rank
FROM fastfood
GROUP BY Restaurant
ORDER BY Rank;
```

100 %

Results | Messages

	Restaurant	No. of Menu items	Rank
1	Taco Bell	115	1
2	Subway	96	2
3	Burger King	70	3
4	McdoOlds	57	4
5	Arbys	55	5
6	Sonic	53	6
7	Dairy Queen	42	7
8	Chick Fil-A	27	8



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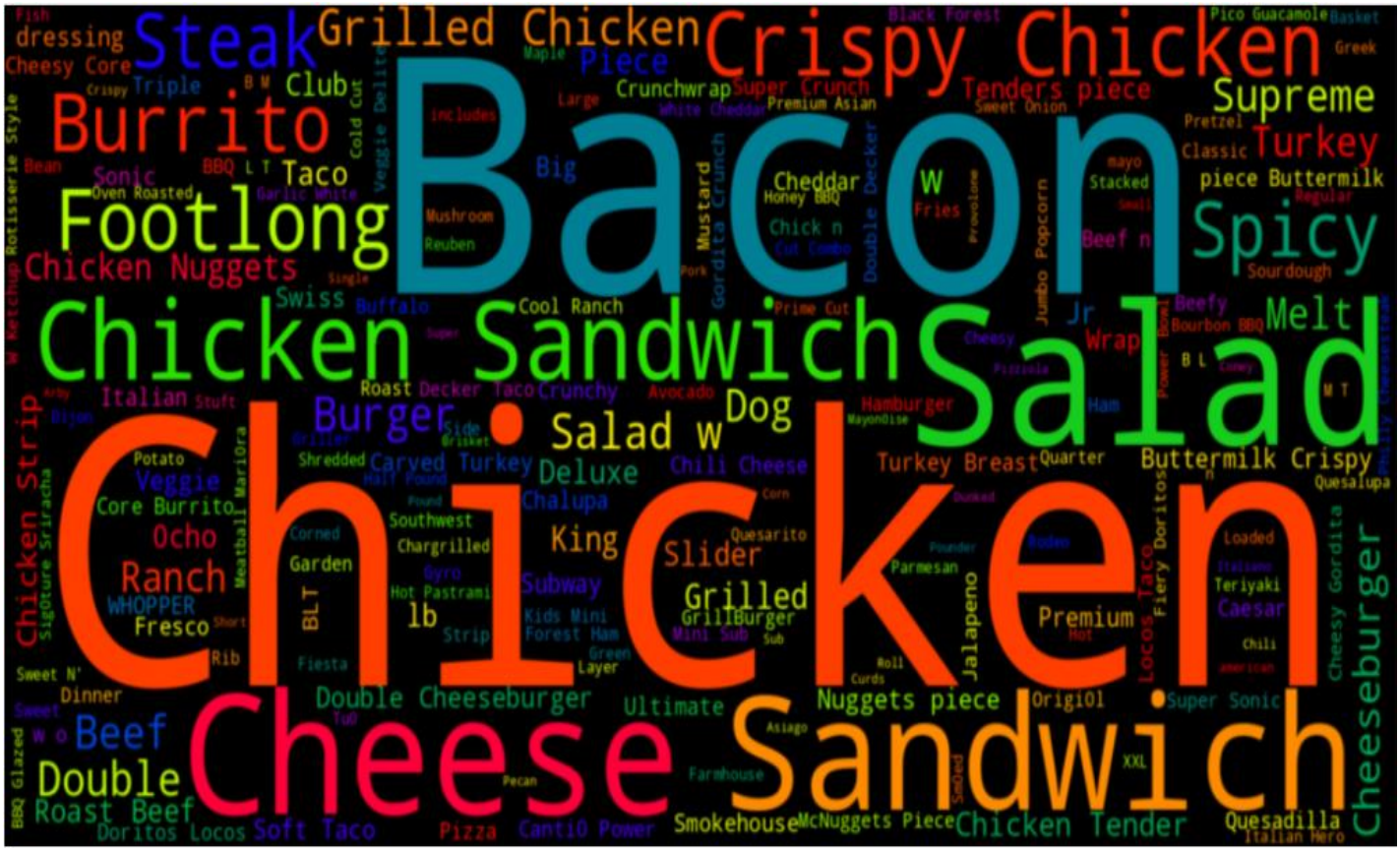
[3b]:Which of these Menu Items appears most (WordCroud)across Restaurants?



[See Python Codes at the bottom]

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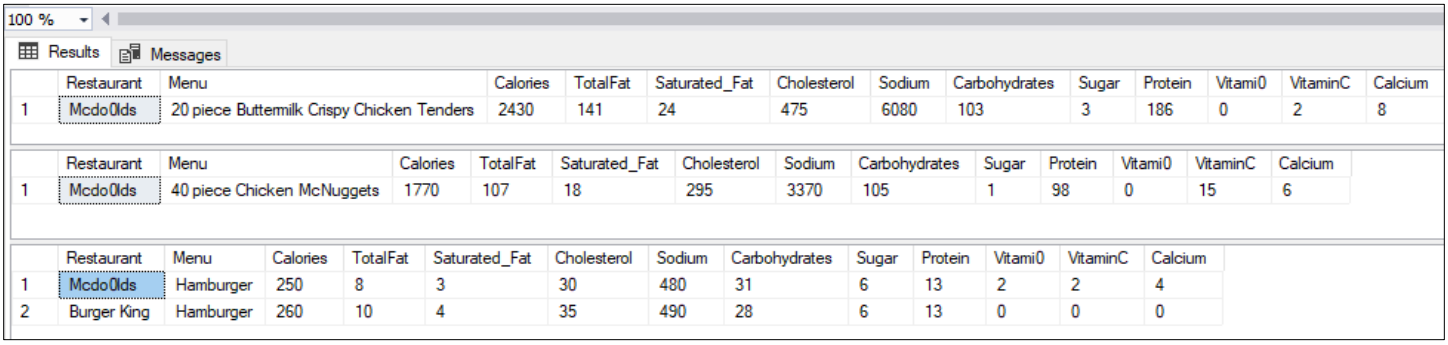
[4]: What Nutritional values do you get when you eat the following menu items?

a. 20-piece Buttermilk Crispy Chicken Tenders b. 40-piece Chicken McNuggets c. Hamburger

```
SELECT Restaurant,Menu,
       Calories, TotalFat, Saturated_Fat, Cholesterol,
       Sodium, Carbohydrates,  Sugar, Protein,
       Vitami0, VitaminC, Calcium
FROM fastfood
WHERE Menu = '20 piece Buttermilk Crispy Chicken Tenders'
SELECT Restaurant,Menu,
       Calories, TotalFat, Saturated_Fat, Cholesterol,
       Sodium, Carbohydrates,  Sugar, Protein,
       Vitami0, VitaminC, Calcium
FROM fastfood
WHERE Menu ='40 piece Chicken McNuggets';
SELECT Restaurant,Menu,
       Calories, TotalFat, Saturated_Fat, Cholesterol,
       Sodium, Carbohydrates,  Sugar, Protein,
       Vitami0, VitaminC, Calcium
FROM fastfood
WHERE Menu ='Hamburger';
```



100 %

Results | Messages

	Restaurant	Menu	Calories	TotalFat	Saturated_Fat	Cholesterol	Sodium	Carbohydrates	Sugar	Protein	Vitami0	VitaminC	Calcium
1	Mcdo0lds	20 piece Buttermilk Crispy Chicken Tenders	2430	141	24	475	6080	103	3	186	0	2	8

	Restaurant	Menu	Calories	TotalFat	Saturated_Fat	Cholesterol	Sodium	Carbohydrates	Sugar	Protein	Vitami0	VitaminC	Calcium
1	Mcdo0lds	40 piece Chicken McNuggets	1770	107	18	295	3370	105	1	98	0	15	6

	Restaurant	Menu	Calories	TotalFat	Saturated_Fat	Cholesterol	Sodium	Carbohydrates	Sugar	Protein	Vitami0	VitaminC	Calcium
1	Mcdo0lds	Hamburger	250	8	3	30	480	31	6	13	2	2	4
2	Burger King	Hamburger	260	10	4	35	490	28	6	13	0	0	0

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[4b]: What is the percentage recommended daily intake for each menu item? List the top 15 Menu Items.

Calories:2000-2500 kcal/day for men and 1600-2000 kcal/day for women
sugar: no more than 6 teaspoons (25 grams) per day for women and 9 teaspoons (38 grams) per day for men
Calcium: ranges from 1,000 to 1,300 milligrams per day for adults
Vitamin A: RDI is 900 micrograms (mcg) per day for men and 700 mcg per day for women.
Vitamin C: RDI is 90 milligrams (mg) per day for men and 75 mg per day for women.
Sodium: less than 2,300 milligrams per day for most adults and less than 1,500 milligrams per day for individuals with high blood pressure, kidney disease,
Data Source: https://www.kaggle.com/datasets/ulrikthygepedersen/fastfood-nutrition

```
SELECT Top 15
Menu,
       (Calories/2500)*100 AS [% Calories Daily Recom],
       (Sugar/25)*100 AS [% Sugar Daily Recom],
       (Calcium/1300)*100 AS [% Calcium Daily Recom],
       (Vitami0/900)*100 AS [% VitaminA Daily Recom],
       (VitaminC/90)*100 AS [% VitaminC Daily Recom],
       (Sodium/2300)*100 AS [% Sodium Daily Recom],
RANK() OVER (ORDER BY ((Sodium/2300)*100) DESC) AS Rank
FROM fastfood
ORDER BY Rank;
```

100 %

Results | Messages

	Menu	% Calories Daily Recom	% Sugar Daily Recom	% Calcium Daily Recom	% VitaminA Daily Recom	% VitaminC Daily Recom	% Sodium Daily Recom	Rank
1	20 piece Buttermilk Crispy Chicken Tenders	97.2	12	0.615384615384615	0	2.22222222222222	264.347826086957	1
2	Buffalo Dunked Ultimate Chicken Sandwich	40	48	0	0	0	196.521739130435	2
3	10 piece Sweet N' Spicy Honey BBQ Glazed Tenders	64	348	0.769230769230769	0.888888888888889	44.4444444444444	193.478260869565	3
4	12 piece Buttermilk Crispy Chicken Tenders	60.4	8	0.461538461538462	0	2.22222222222222	163.913043478261	4
5	30 piece Chicken Nuggets	38.8	4	0.769230769230769	0	22.2222222222222	159.130434782609	5
6	Footlong Corned Beef Reuben	37.6	96	3.07692307692308	2.22222222222222	77.7777777777778	153.913043478261	6
7	6 Piece Chicken Strip Basket w/ Country Gravy	50.4	16	0.769230769230769	0.222222222222222	0	152.173913043478	7
8	40 piece Chicken McNuggets	70.8	4	0.461538461538462	0	16.6666666666667	146.521739130435	8
9	Half Pound French Dip & Swiss	30	12	0	0	0	145.652173913043	9
10	10 piece Buttermilk Crispy Chicken Tenders	48.4	16	0.307692307692308	0	0	140.434782608696	10
11	Footlong Carved Turkey & Bacon w/ Cheese	45.6	64	6.15384615384615	2.22222222222222	44.4444444444444	139.130434782609	11
12	Footlong Spicy Italian	38.4	64	4.61538461538462	1.77777777777778	44.4444444444444	132.173913043478	12
13	Turkey, Bacon & Guacamole Wrap	32.4	24	2.30769230769231	1.11111111111111	33.3333333333333	129.130434782609	13
14	Footlong Turkey Italiano Melt (with Provolone)	39.2	64	6.92307692307692	2.22222222222222	44.4444444444444	128.695652173913	14
15	Footlong Italian Hero	44	72	6.15384615384615	2.22222222222222	44.4444444444444	127.826086956522	15

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[4c]: What is the maximum Sodium in each menu items; list the top 15 menu items and their corresponding maximum Cholesterol, Calories Fat, Calories, Total Fat and Saturated Fat (Rank by Sodium)?

```
SELECT Top 15
Menu,
       MAX(Cholesterol) AS [Max Cholesterol],
       MAX(CaloriesFat) AS [Max CaloriesFat],
       MAX(Calories) AS [Max Calories],
       MAX(TotalFat) AS [Max TotalFat],
       MAX(Saturated_Fat) AS [Max Saturated Fat],
       MAX(Sodium) AS [Max Sodium],
RANK() OVER (ORDER BY MAX(Sodium) DESC) AS Rank
FROM fastfood
GROUP BY  Menu
ORDER BY Rank;
```

100 %

Results | Messages | Execution plan

	Menu	Max Cholesterol	Max CaloriesFat	Max Calories	Max TotalFat	Max Saturated Fat	Max Sodium	Rank
1	20 piece Buttermilk Crispy Chicken Tenders	475	1270	2430	141	24	6080	1
2	Buffalo Dunked Ultimate Chicken Sandwich	125	550	1000	61	12	4520	2
3	10 piece Sweet N' Spicy Honey BBQ Glazed Tenders	265	600	1600	66	10	4450	3
4	12 piece Buttermilk Crispy Chicken Tenders	295	790	1510	88	15	3770	4
5	30 piece Chicken Nuggets	285	414	970	46	2.5	3660	5
6	Footlong Corned Beef Reuben	170	260	940	30	9	3540	6
7	6 Piece Chicken Strip Basket w/ Country Gravy	120	590	1260	66	11	3500	7
8	40 piece Chicken McNuggets	295	960	1770	107	18	3370	8
9	Half Pound French Dip & Swiss	150	330	750	36	17	3350	9
10	10 piece Buttermilk Crispy Chicken Tenders	240	630	1210	70	12	3230	10
11	Footlong Carved Turkey & Bacon w/ Cheese	140	460	1140	52	14	3200	11
12	Footlong Spicy Italian	100	440	960	48	18	3040	12
13	Turkey, Bacon & Guacamole Wrap	75	380	810	42	13	2970	13
14	Footlong Turkey Italiano Melt (with Provolone)	100	420	980	48	18	2960	14
15	Triple Decker Sandwich	155	459	1030	51	17	2940	15

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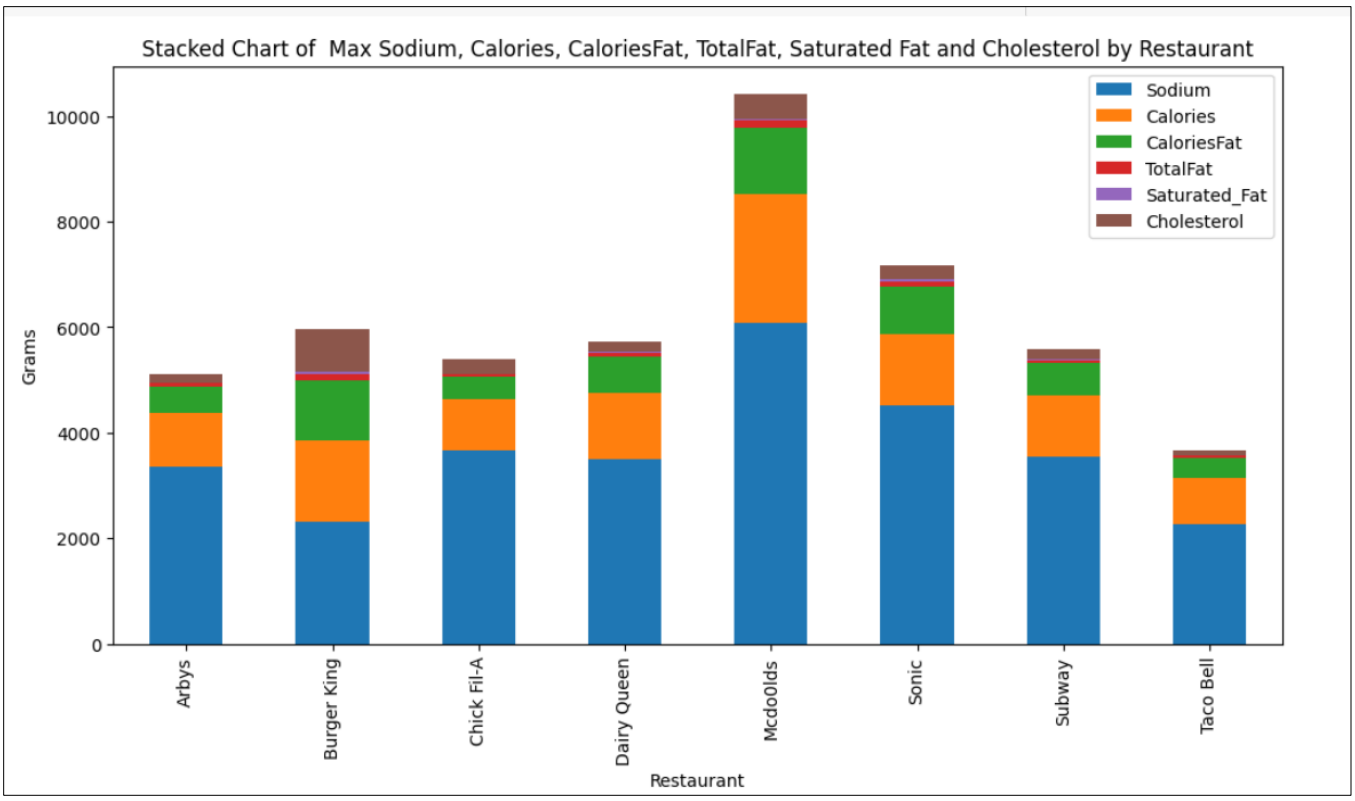
[4c]: What is the maximum Sodium used by each restaurant; list the corresponding maximum Cholesterol, Calories Fat, Calories, Total Fat and Saturated Fat in their Menu Items (Rank by Sodium)?

```
SELECT Top 15
 Restaurant,
       MAX(Cholesterol) AS [Max Cholesterol],
    MAX(CaloriesFat) AS [Max CaloriesFat],
       MAX(Calories) AS [Max Calories],
       MAX(TotalFat) AS [Max TotalFat],
       MAX(Saturated_Fat) AS [Max Saturated Fat],
       MAX(Sodium) AS [Max Sodium],
RANK() OVER (ORDER BY MAX(Sodium) DESC) AS Rank
FROM fastfood
GROUP BY  Restaurant
ORDER BY Rank;
```

100 % | Results | Messages | Execution plan

	Restaurant	Max Cholesterol	Max CaloriesFat	Max Calories	Max TotalFat	Max Saturated Fat	Max Sodium	Rank
1	Mcdo0lds	475	1270	2430	141	27	6080	1
2	Sonic	260	900	1350	100	36	4520	2
3	Chick Fil-A	285	423	970	47	16	3660	3
4	Subway	190	620	1160	62	22	3540	4
5	Dairy Queen	180	670	1260	75	43	3500	5
6	Arbys	155	495	1030	59	17	3350	6
7	Burger King	805	1134	1550	126	47	2310	7
8	Taco Bell	85	380	880	42	14	2260	8



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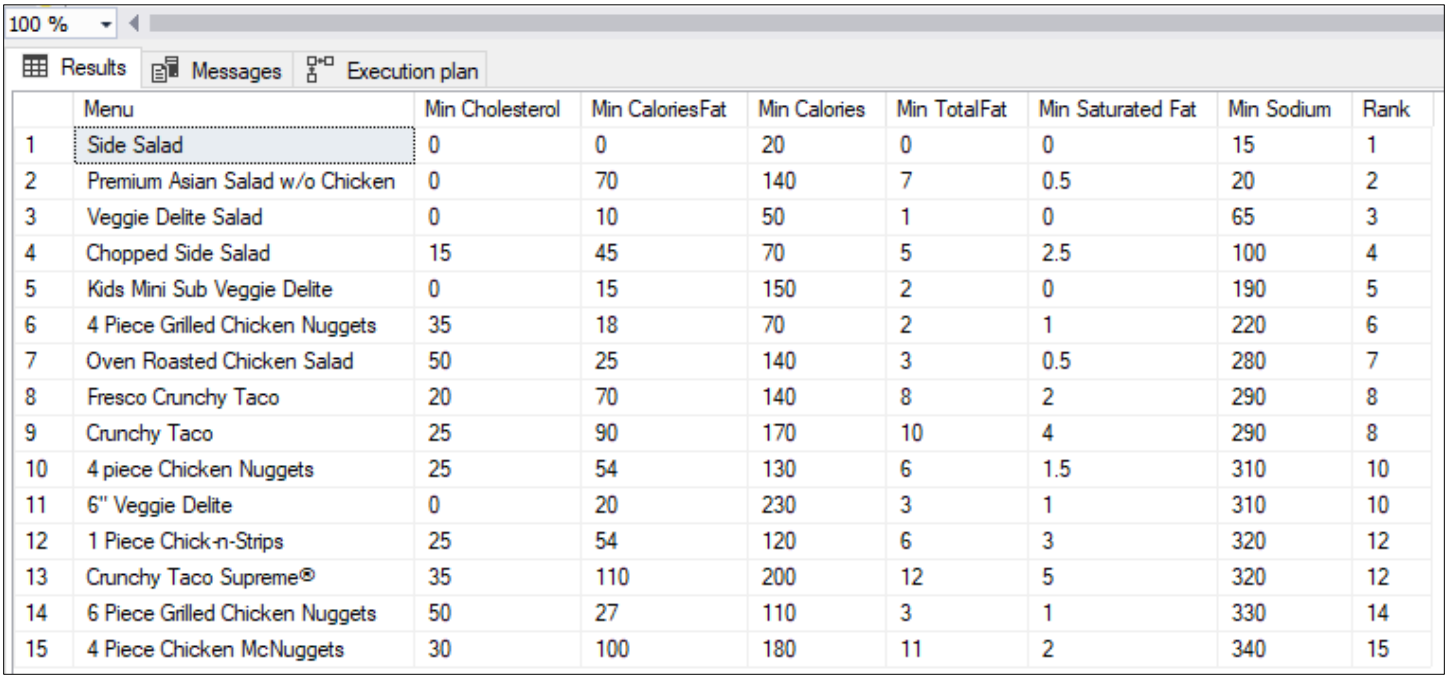
[5]: What is the minimum Sodium in each menu items; list the top 15 Menu items and their corresponding minimum Cholesterol, Calories Fat, Calories, Total Fat and Saturated Fat (Rank by Sodium)?

```
SELECT Top 15
Menu,
       MIN(Cholesterol) AS [Min Cholesterol],
       MIN(CaloriesFat) AS [Min CaloriesFat],
       MIN(Calories) AS [Min Calories],
       MIN(TotalFat) AS [Min TotalFat],
       MIN(Saturated_Fat) AS [Min Saturated Fat],
       MIN(Sodium) AS [Min Sodium],
RANK() OVER (ORDER BY MIN(Sodium) ASC) AS Rank
FROM fastfood
GROUP BY  Menu
ORDER BY Rank;
```



100 %

Results | Messages | Execution plan

	Menu	Min Cholesterol	Min CaloriesFat	Min Calories	Min TotalFat	Min Saturated Fat	Min Sodium	Rank
1	Side Salad	0	0	20	0	0	15	1
2	Premium Asian Salad w/o Chicken	0	70	140	7	0.5	20	2
3	Veggie Delite Salad	0	10	50	1	0	65	3
4	Chopped Side Salad	15	45	70	5	2.5	100	4
5	Kids Mini Sub Veggie Delite	0	15	150	2	0	190	5
6	4 Piece Grilled Chicken Nuggets	35	18	70	2	1	220	6
7	Oven Roasted Chicken Salad	50	25	140	3	0.5	280	7
8	Fresco Crunchy Taco	20	70	140	8	2	290	8
9	Crunchy Taco	25	90	170	10	4	290	8
10	4 piece Chicken Nuggets	25	54	130	6	1.5	310	10
11	6" Veggie Delite	0	20	230	3	1	310	10
12	1 Piece Chick-n-Strips	25	54	120	6	3	320	12
13	Crunchy Taco Supreme®	35	110	200	12	5	320	12
14	6 Piece Grilled Chicken Nuggets	50	27	110	3	1	330	14
15	4 Piece Chicken McNuggets	30	100	180	11	2	340	15

==========

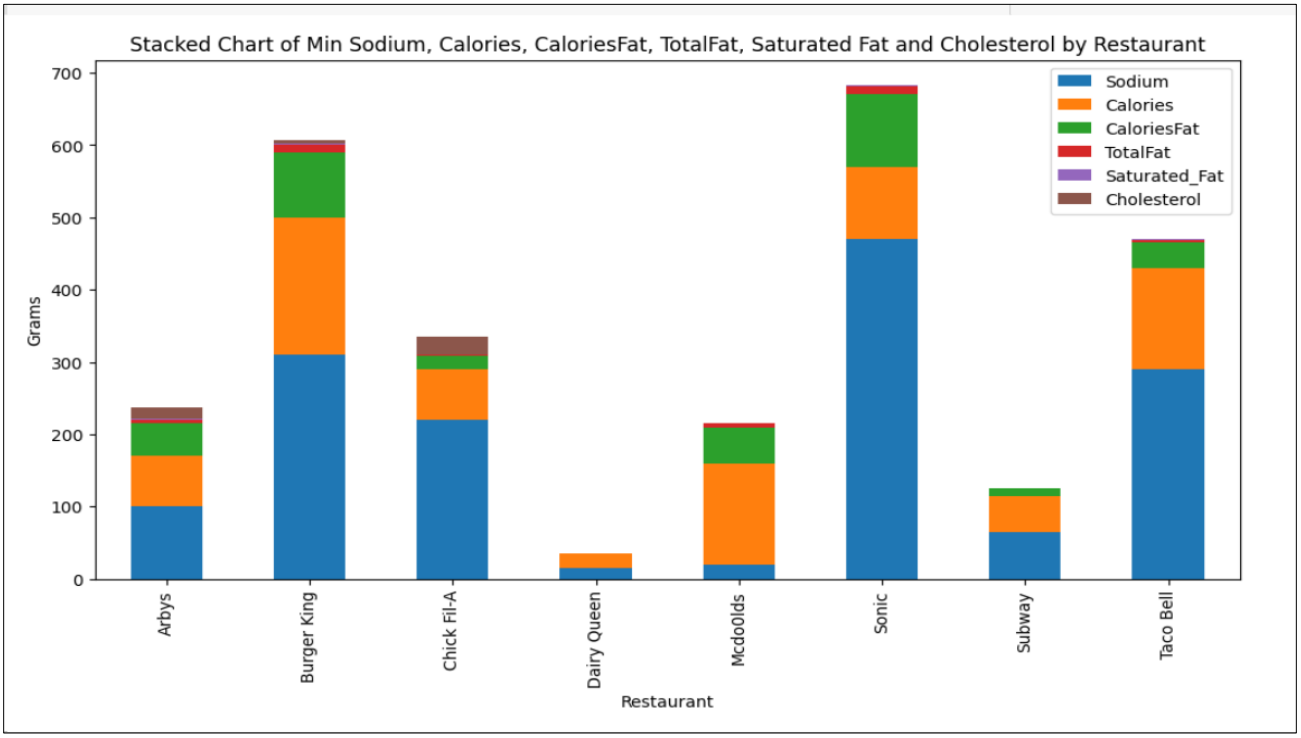
[5b]: What is the minimum Sodium used by each restaurant; list the corresponding minimum Cholesterol, Calories Fat, Calories, Total Fat and Saturated Fat in their Menu Items (Rank by Sodium)?

```
SELECT Top 15
 Restaurant,
    MIN(CaloriesFat) AS [Min CaloriesFat],
       MIN(Cholesterol) AS [Min Cholesterol],
       MIN(Calories) AS [Min Calories],
       MIN(TotalFat) AS [Min TotalFat],
       MIN(Saturated_Fat) AS [Min Saturated Fat],
       MIN(Sodium) AS [Min Sodium],
RANK() OVER (ORDER BY MIN(Sodium) ASC) AS Rank
FROM fastfood
GROUP BY  Restaurant
ORDER BY Rank;
```

100 %

Results | Messages | Execution plan

	Restaurant	Min CaloriesFat	Min Cholesterol	Min Calories	Min TotalFat	Min Saturated Fat	Min Sodium	Rank
1	Dairy Queen	0	0	20	0	0	15	1
2	Mcdo0lds	50	0	140	5	0.5	20	2
3	Subway	10	0	50	1	0	65	3
4	Arbys	45	15	70	5	1.5	100	4
5	Chick Fil-A	18	25	70	2	0	220	5
6	Taco Bell	35	0	140	4	1	290	6
7	Burger King	90	5	190	10	2	310	7
8	Sonic	100	0	100	11	2.5	470	8



==========

[6]: What is the maximum Protein in each Menu item, list their corresponding maximum Vitamin A, Vitamin C and Calcium (Rank by Proteins).

```
SELECT Top 15
Menu,
    MAX(Vitami0) AS [Max Vitamin A],
       MAX(VitaminC) AS [Max Vitamin C],
       MAX(Calcium) AS [Max Calcium],
       MAX(Protein) AS [Max Protein],
    RANK() OVER (ORDER BY MAX(Protein) DESC) AS Rank
FROM fastfood
GROUP BY Menu
ORDER BY Rank;
```

100 %

Results | Messages | Execution plan

	Menu	Max VitaminA	Max VitaminC	Max Calcium	Max Protein	Rank
1	20 piece Buttermilk Crispy Chicken Tenders	0	2	8	186	1
2	American Brewhouse King	0	0	0	134	2
3	12 piece Buttermilk Crispy Chicken Tenders	0	2	6	115	3
4	30 piece Chicken Nuggets	0	20	10	103	4
5	40 piece Chicken McNuggets	0	15	6	98	5
6	10 piece Sweet N' Spicy Honey BBQ Glazed Tenders	8	40	10	97	6
7	10 piece Buttermilk Crispy Chicken Tenders	0	0	4	94	7
8	Footlong Corned Beef Reuben	20	70	40	78	8
9	Footlong Big Philly Cheesesteak	30	40	100	76	9
10	Footlong Chicken & Bacon Ranch Melt	30	50	100	70	10
11	Double Bacon Smokehouse Burger	10	20	50	70	10
12	Super Sonic Bacon Double Cheeseburger (w/mayo)	15	6	40	67	12
13	Footlong Carved Turkey & Bacon w/ Cheese	20	40	80	66	13
14	Footlong Chicken Pizziola Melt	30	60	90	64	14
15	Super Sonic Double Cheeseburger W/ Ketchup	20	10	40	63	15

==========

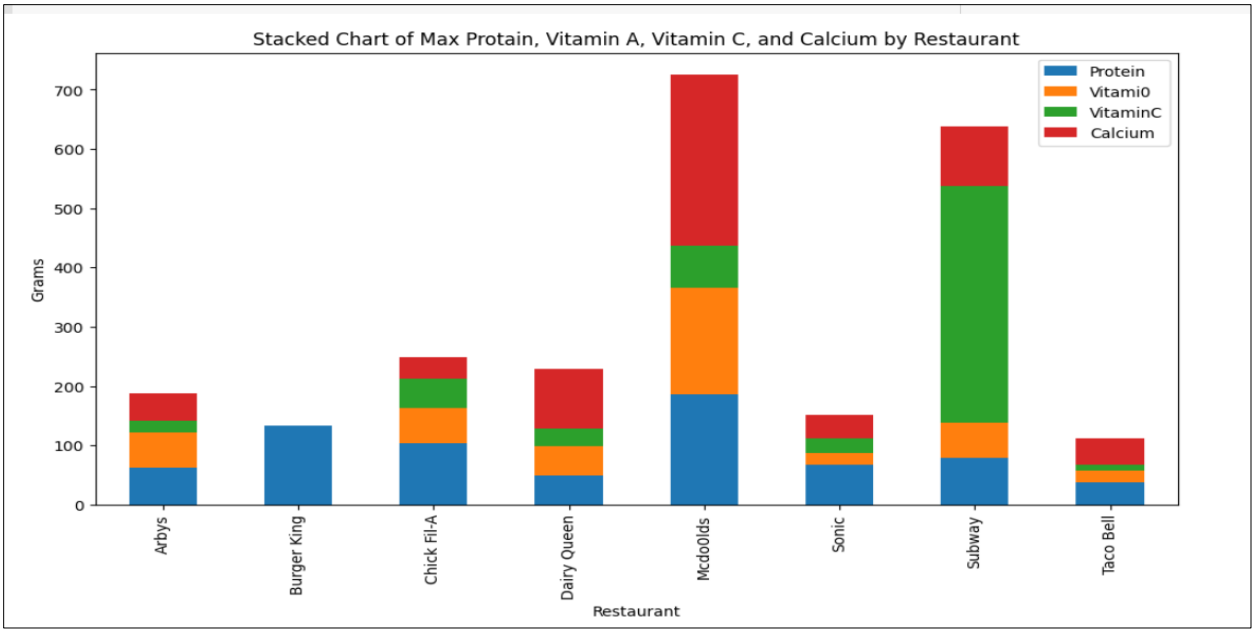
[6b]: What is the maximum Protein used by each Restaurant; list their corresponding maximum Vitamin A, Vitamin C and Calcium in their Menu Items (Rank by Proteins).

```
SELECT Top 20
Restaurant,
    MAX(Vitami0) AS [Max VitaminA],
       MAX(VitaminC) AS [Max VitaminC],
       MAX(Calcium) AS [Max Calcium],
       MAX(Protein) AS [Max Protein],
    RANK() OVER (ORDER BY MAX(Protein) DESC) AS Rank
FROM fastfood
GROUP BY Restaurant
ORDER BY Rank;
```

100 %

Results | Messages | Execution plan

	Restaurant	Max VitaminA	Max VitaminC	Max Calcium	Max Protein	Rank
1	Mcdolds	180	70	290	186	1
2	Burger King	0	0	0	134	2
3	Chick Fil-A	60	50	35	103	3
4	Subway	60	400	100	78	4
5	Sonic	20	25	40	67	5
6	Arbys	60	20	45	62	6
7	Dairy Queen	50	30	100	49	7
8	Taco Bell	20	10	45	37	8



==========

[6b]: What is the average Sodium Content? Which menu items exceeds the average contents?

```
Select  FLOOR(AVG(Sodium)) As [Avg Sodium Content]
from fastfood;

SELECT Top 15
       Menu,
       FLOOR(AVG(Sodium)) AS [Menu exceeds avg Sodium Content]
FROM fastfood
WHERE Sodium > (Select  AVG(Sodium)from fastfood)
GROUP BY Menu;
```

100 %

Results | Messages | Execution plan

	Avg Sodium Content
1	1246

	Menu	Menu exceeds avg Sodium Content
1	0cho Fries Bellgrande	1420
2	1/2 lb. FlameThrower® GrillBurger	1610
3	1/2 lb. GrillBurger with Cheese	1280
4	1/2 lb.* Cheesy Potato Burrito	1360
5	1/2 lb.* Combo Burrito	1320
6	1/4 lb. Bacon Cheese GrillBurger	1250
7	10 piece Buttermilk Crispy Chicken Tenders	3230
8	10 piece Sweet N' Spicy Honey BBQ Glazed Tenders	4450
9	12 piece Buttermilk Crispy Chicken Tenders	3770
10	12 piece Chicken Nuggets	1460
11	20 piece Buttermilk Crispy Chicken Tenders	6080
12	20 Piece Chicken McNuggets	1680
13	20 Piece Chicken Nuggets	1530
14	3 Piece Super Crunch Chicken Strip Dinner	2160
15	30 piece Chicken Nuggets	3660

==========

[6c]: Summary Statistics for all the Nutritional Content *[Python Codes at the bottom]*

	count	mean	std	min	25%	50%	75%	max
Calories	515.000000	530.912621	282.436147	20.000000	330.000000	490.000000	690.000000	2430.000000
CaloriesFat	515.000000	238.813592	166.407510	0.000000	120.000000	210.000000	310.000000	1270.000000
TotalFat	515.000000	26.590291	18.411876	0.000000	14.000000	23.000000	35.000000	141.000000
Saturated_Fat	515.000000	8.153398	6.418811	0.000000	4.000000	7.000000	11.000000	47.000000
TransFat	515.000000	0.465049	0.839644	0.000000	0.000000	0.000000	1.000000	8.000000
Cholesterol	515.000000	72.456311	63.160406	0.000000	35.000000	60.000000	95.000000	805.000000
Sodium	515.000000	1246.737864	689.954278	15.000000	800.000000	1110.000000	1550.000000	6080.000000
Carbohydrates	515.000000	45.664078	24.883342	0.000000	28.500000	44.000000	57.000000	156.000000
Fiber	515.000000	4.040777	3.066114	0.000000	2.000000	3.000000	5.000000	17.000000
Sugar	515.000000	7.262136	6.761301	0.000000	3.000000	6.000000	9.000000	87.000000
Protein	515.000000	27.836893	17.709409	0.000000	15.500000	24.000000	36.000000	186.000000
Vitami0	515.000000	11.021359	25.718045	0.000000	0.000000	2.000000	15.000000	180.000000
VitaminC	515.000000	11.945631	25.533547	0.000000	0.000000	2.000000	15.000000	400.000000
Calcium	515.000000	14.718447	23.123513	0.000000	0.000000	6.000000	25.000000	290.000000

==========

[6d]: Summary Quantiles for all the Nutritional Content *[Python Codes at the bottom]*

index	0.250000	0.500000	0.600000	0.750000	0.900000	0.950000	0.990000
Calories	330.000000	490.000000	560.000000	690.000000	886.000000	1033.000000	1340.200000
CaloriesFat	120.000000	210.000000	245.800000	310.000000	431.200000	570.900000	788.600000
TotalFat	14.000000	23.000000	27.000000	35.000000	48.000000	61.300000	87.860000
Saturated_Fat	4.000000	7.000000	8.000000	11.000000	15.000000	21.000000	32.000000
TransFat	0.000000	0.000000	0.000000	1.000000	1.500000	2.000000	3.930000
Cholesterol	35.000000	60.000000	70.000000	95.000000	130.000000	175.000000	282.200000
Sodium	800.000000	1110.000000	1274.000000	1550.000000	2050.000000	2420.000000	3534.400000
Carbohydrates	28.500000	44.000000	47.400000	57.000000	82.600000	94.000000	117.160000
Fiber	2.000000	3.000000	4.000000	5.000000	9.000000	10.000000	14.000000
Sugar	3.000000	6.000000	7.000000	9.000000	14.000000	16.000000	33.440000
Protein	15.500000	24.000000	29.000000	36.000000	46.600000	56.300000	96.580000
Vitami0	0.000000	2.000000	6.000000	15.000000	25.000000	50.000000	180.000000
VitaminC	0.000000	2.000000	6.000000	15.000000	40.000000	50.000000	70.000000
Calcium	0.000000	6.000000	10.000000	25.000000	40.000000	60.000000	88.600000

==========

Section II: Individual Nutrients Comparison by Restaurants

==========

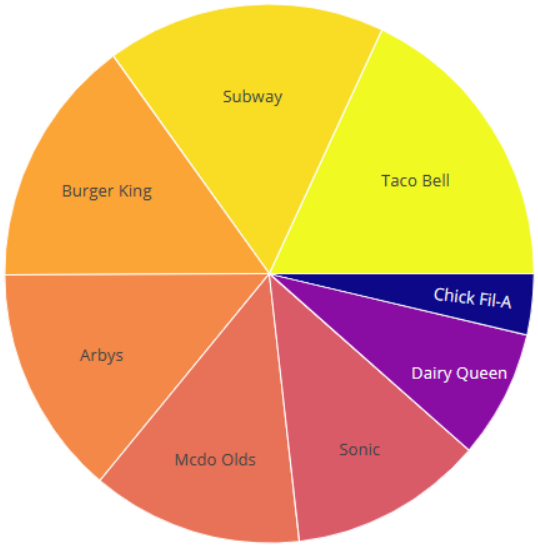
[7]: Comparison of Total Calories across Restaurants

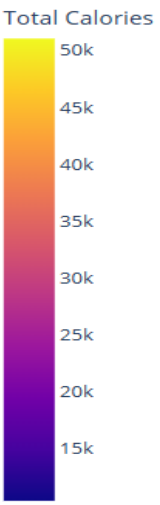
```
SELECT Restaurant, SUM(Calories) AS [Total Calories],
RANK() OVER (ORDER BY SUM(Calories) DESC) AS Rank
FROM fastfood
GROUP BY Restaurant
ORDER BY Rank;
```

100 %

Results | Messages | Execution plan

	Restaurant	Total Calories	Rank
1	Taco Bell	51020	1
2	Subway	48290	2
3	Burger King	42600	3
4	Mcdo0lds	36500	4
5	Sonic	33480	5
6	Arbys	29300	6
7	Dairy Queen	21850	7
8	Chick Fil-A	10380	8





==========

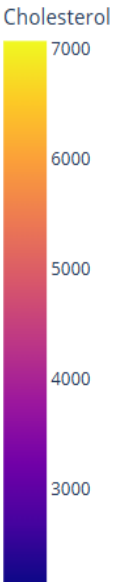
[7b]: Comparison of Total Cholesterol across Restaurants

```
SELECT Restaurant, SUM(Cholesterol) AS [Total Cholesterol],
RANK() OVER (ORDER BY SUM(Cholesterol) DESC) AS Rank
FROM fastfood
GROUP BY Restaurant
ORDER BY Rank;
```

100 %

Results | Messages | Execution plan

	Restaurant	Total Cholesterol	Rank
1	Burger King	7060	1
2	Mcdo0lds	6255	2
3	Subway	5885	3
4	Sonic	4610	4
5	Taco Bell	4490	5
6	Arbys	3875	6
7	Dairy Queen	3005	7
8	Chick Fil-A	2135	8



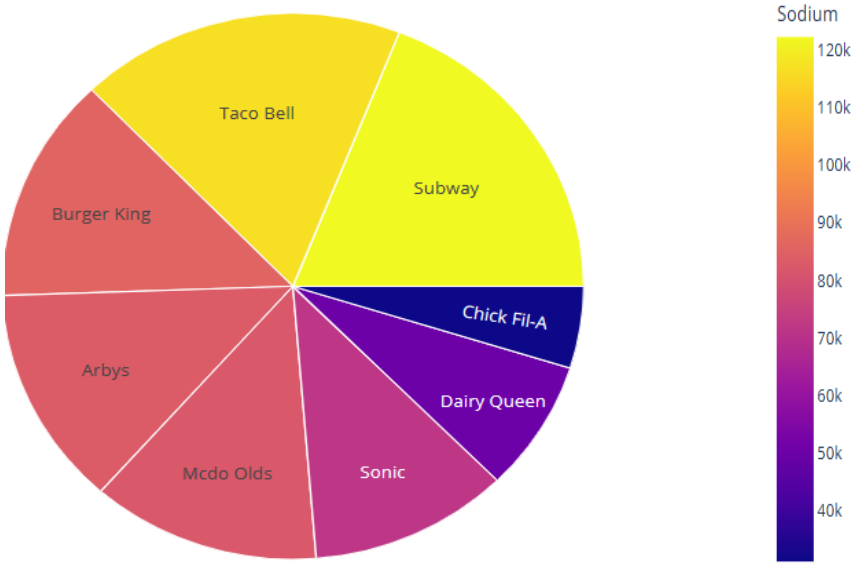
==========

[7c]: Comparison of Total Sodium across Restaurants

```
SELECT Restaurant, SUM(Sodium) AS [Total Sodium],
RANK() OVER (ORDER BY SUM(Sodium) DESC) AS Rank
FROM fastfood
GROUP BY Restaurant
ORDER BY Rank;
```

100 % | Results | Messages | Execution plan

	Restaurant	Total Sodium	Rank
1	Subway	122205	1
2	Taco Bell	116600	2
3	Burger King	85650	3
4	Arbys	83340	4
5	Mcdo0lds	81960	5
6	Sonic	71590	6
7	Dairy Queen	49635	7
8	Chick Fil-A	31090	8



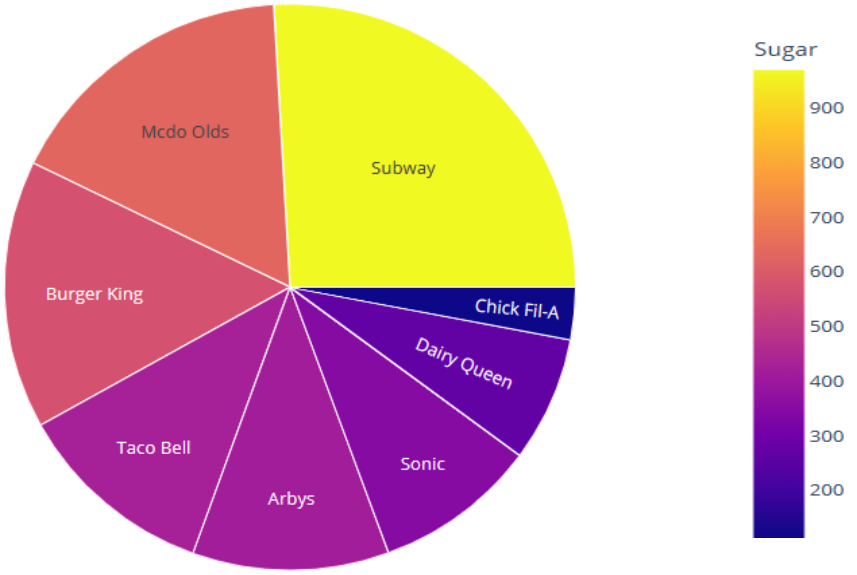
==========

[7d]: Comparison of Total Sugar across Restaurants

```
SELECT Restaurant, SUM(Sugar) AS [Total Sugar],
RANK() OVER (ORDER BY SUM(Sugar) DESC) AS Rank
FROM fastfood
GROUP BY Restaurant
ORDER BY Rank;
```

100 % | Results | Messages | Execution plan

	Restaurant	Total Sugar	Rank
1	Subway	969	1
2	Mcdo0lds	631	2
3	Burger King	573	3
4	Taco Bell	426	4
5	Arbys	416	5
6	Sonic	346	6
7	Dairy Queen	267	7
8	Chick Fil-A	112	8



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==========

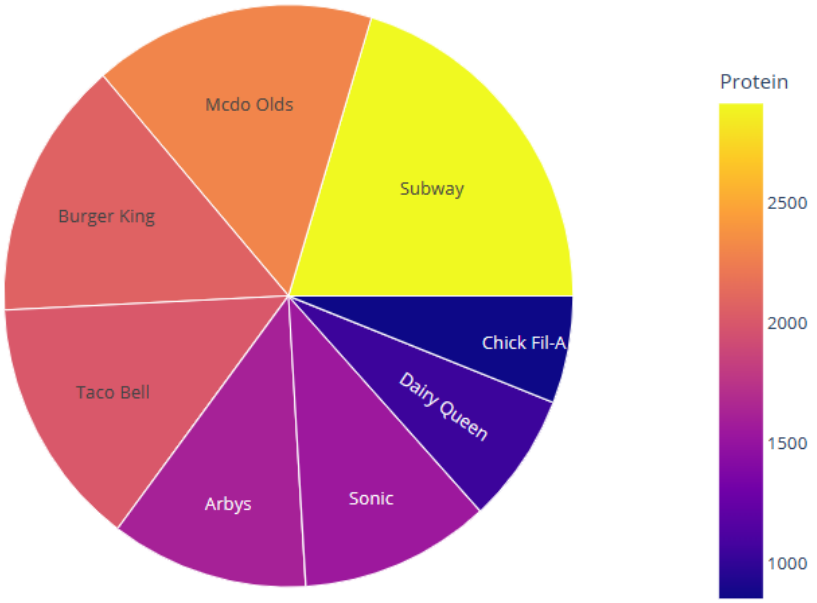
[7e]: Comparison of Total Protein across Restaurants

```
SELECT Restaurant, SUM(Protein) AS [Total Protein],
RANK() OVER (ORDER BY SUM(Protein) DESC) AS Rank
FROM fastfood
GROUP BY Restaurant
ORDER BY Rank;
```

100 %

Results | Messages | Execution plan

	Restaurant	Total Protein	Rank
1	Subway	2910	1
2	Mcdo0lds	2297	2
3	Burger King	2071	3
4	Taco Bell	2003	4
5	Arbys	1609	5
6	Sonic	1547	6
7	Dairy Queen	1043	7
8	Chick Fil-A	856	8



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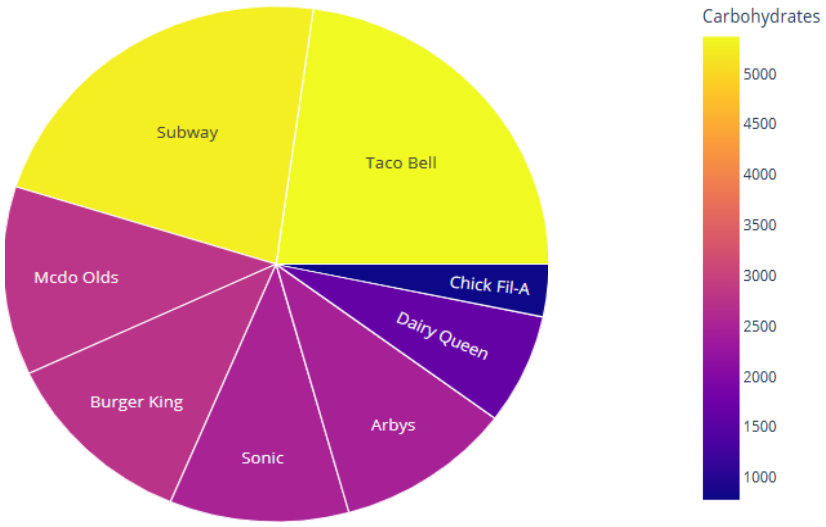
[7d]: Comparison of Total Carbohydrates across Restaurants

```
SELECT Restaurant, SUM(Carbohydrates) AS [Total Carbohydrates],
RANK() OVER (ORDER BY SUM(Carbohydrates) DESC) AS Rank
FROM fastfood
GROUP BY Restaurant
ORDER BY Rank;
```

100 %

Results | Messages | Execution plan

	Restaurant	Total Carbohydrates	Rank
1	Taco Bell	5363	1
2	Subway	5253	2
3	Mcdo0lds	2781	3
4	Burger King	2752	4
5	Sonic	2502	5
6	Arbys	2468	6
7	Dairy Queen	1625	7
8	Chick Fil-A	773	8



==========

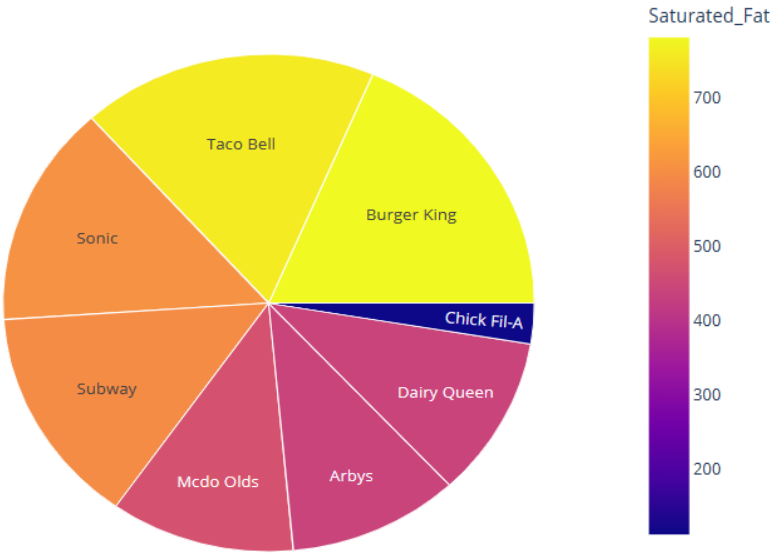
[7f]: Comparison of Total Saturated Fat across Restaurants

```
SELECT Restaurant, FLOOR(SUM(Saturated_Fat)) AS [Total Saturated_Fat],
RANK() OVER (ORDER BY SUM(Saturated_Fat) DESC) AS Rank
FROM fastfood
GROUP BY Restaurant
ORDER BY Rank;
```

100 %

Results | Messages

	Restaurant	Total Saturated_Fat	Rank
1	Burger King	780	1
2	Taco Bell	758	2
3	Sonic	605	3
4	Subway	595	4
5	Mcdo0lds	472	5
6	Arbys	438	6
7	Dairy Queen	438	6
8	Chick Fil-A	111	8



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Section III: Additional Multivariate SQL Analysis/Queries

==========

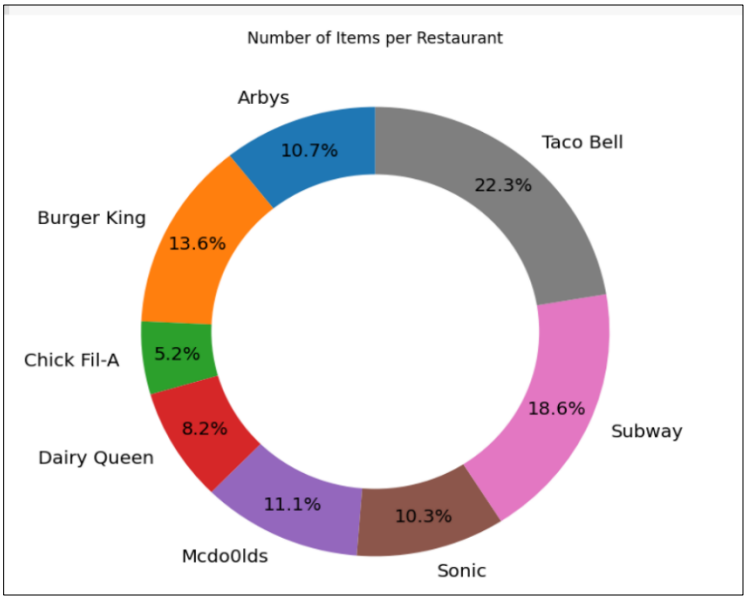
[8]: How many Menu items does each Restaurant have? *[See Python Codes at the bottom]*

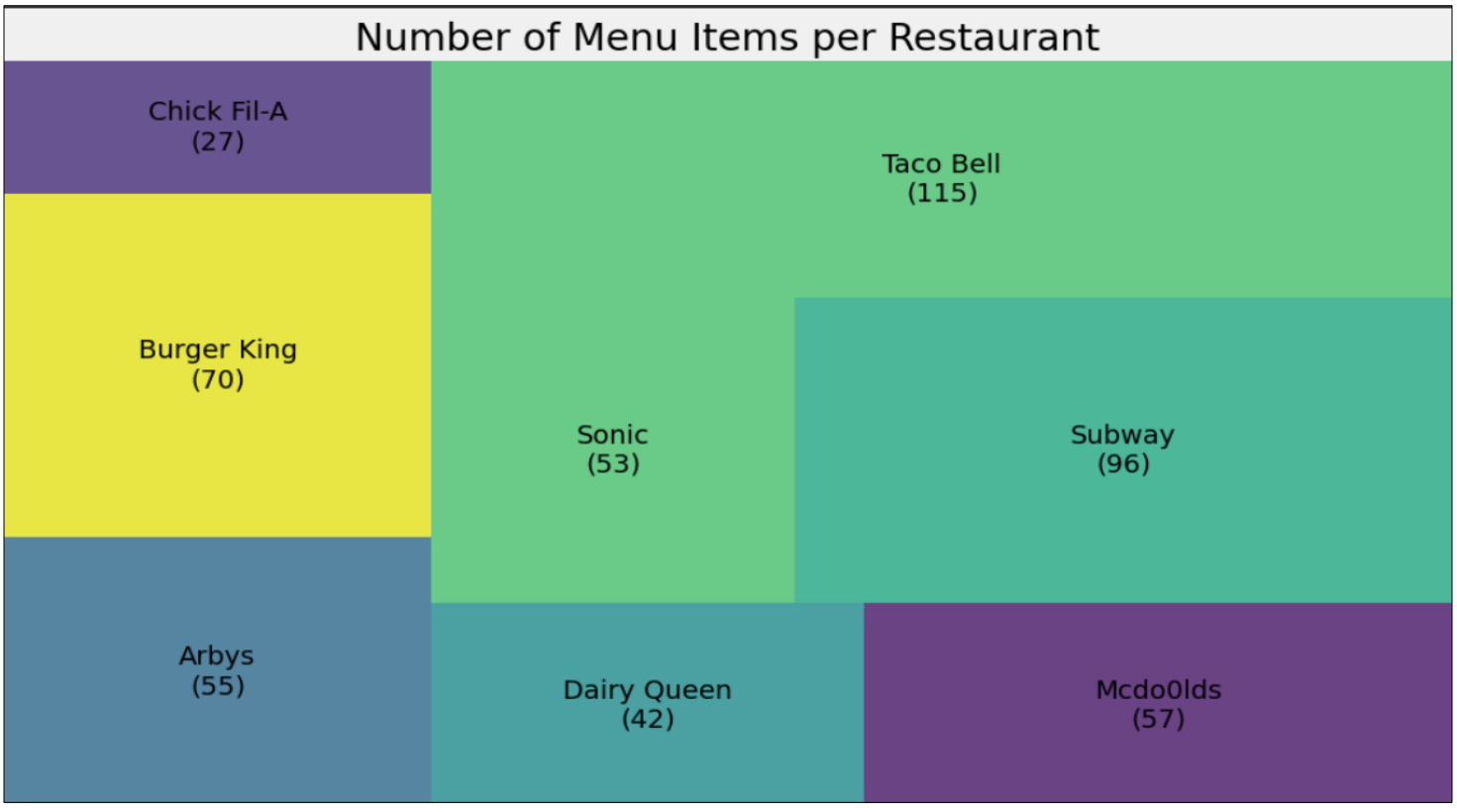
```
SELECT Restaurant, COUNT(*) as [Number of items],
RANK() OVER (ORDER BY Count(Menu) DESC) AS Rank
FROM fastfood
GROUP BY Restaurant
ORDER BY Rank;
```

100 %

Results | Messages

	Restaurant	Number of items	Rank
1	Taco Bell	115	1
2	Subway	96	2
3	Burger King	70	3
4	Mcdo0lds	57	4
5	Arbys	55	5
6	Sonic	53	6
7	Dairy Queen	42	7
8	Chick Fil-A	27	8





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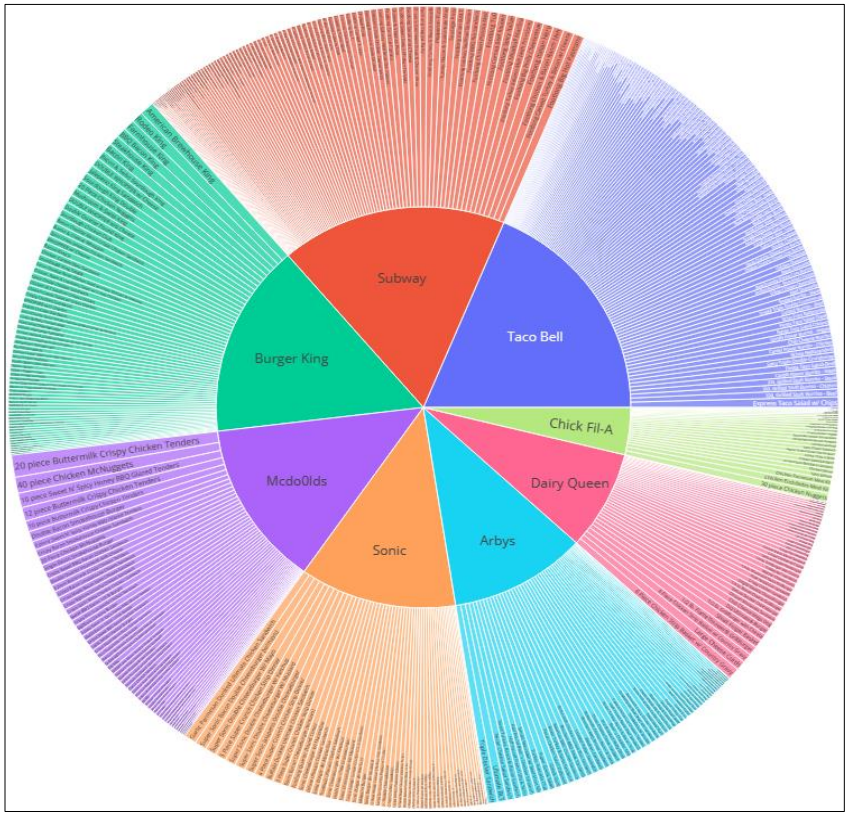
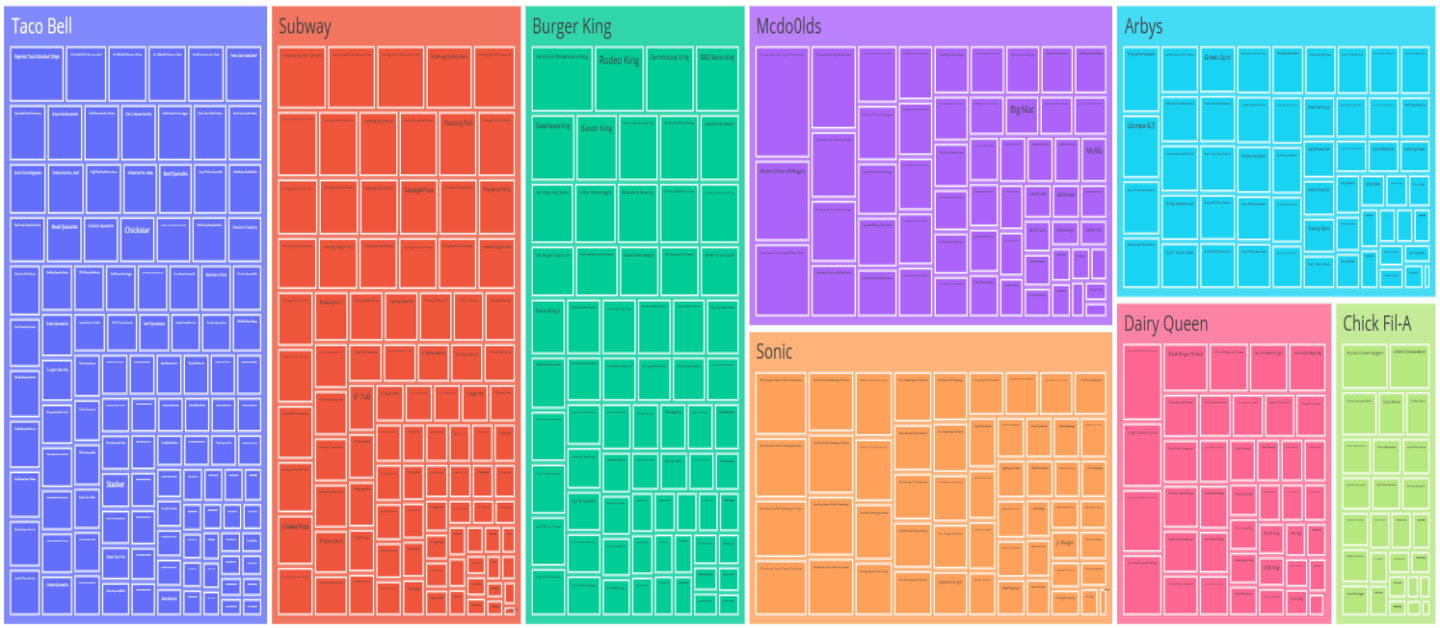
[8b]: A chart showing all the Restaurants and their corresponding menu items



[8c]: A Tree-map showing all the Restaurants and their corresponding menu items

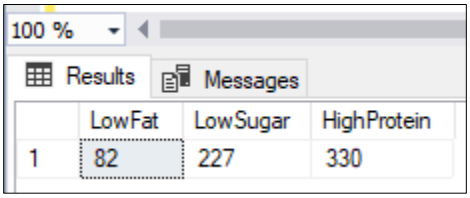


[See Python Codes at the bottom]

==========

[9]: What is the percentage menu items that meet different nutritional criteria (e.g., low-fat, low-sugar):

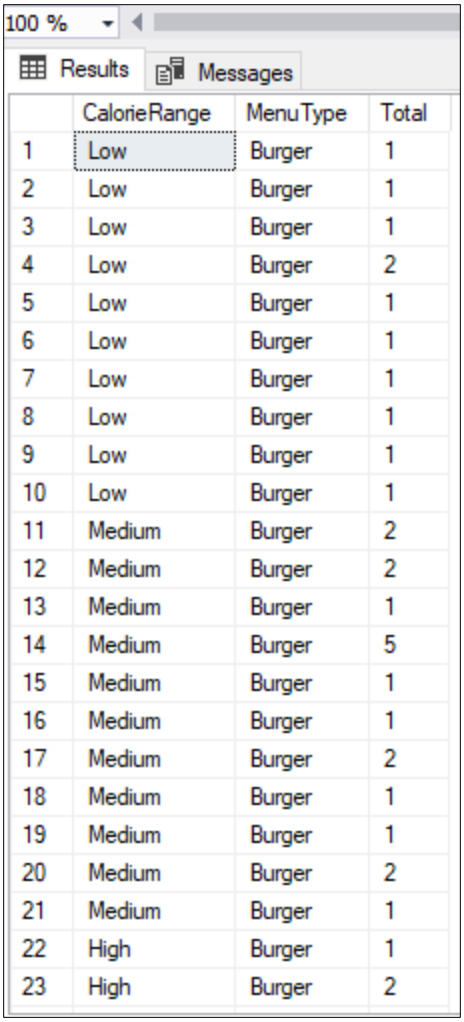
```sql
SELECT
  SUM(CASE WHEN TotalFat <= 10 THEN 1 ELSE 0 END) AS LowFat,
  SUM(CASE WHEN Sugar <= 5 THEN 1 ELSE 0 END) AS LowSugar,
  SUM(CASE WHEN Protein >= 20 THEN 1 ELSE 0 END) AS HighProtein
FROM fastfood;
```



==========

[10]: What is the distribution of different types of menu items by calorie range:

```sql
SELECT
  CASE
    WHEN Calories < 400 THEN 'Low'
    WHEN Calories BETWEEN 400 AND 600 THEN 'Medium'
    ELSE 'High'
  END AS [CalorieRange],
  MenuType,
  COUNT(*) AS Total
FROM (
  SELECT
    Menu,
    CASE
      WHEN Menu LIKE '%burger%' THEN 'Burger'
      WHEN Menu LIKE '%sandwich%' THEN 'Sandwich'
      WHEN Menu LIKE '%salad%' THEN 'Salad'
      ELSE 'Other'
    END AS MenuType,
    Calories
  FROM fastfood
) AS MenuTypeCalories
GROUP BY Calories, MenuType;
```



100 %

Results | Messages

	CalorieRange	MenuType	Total
1	Low	Burger	1
2	Low	Burger	1
3	Low	Burger	1
4	Low	Burger	2
5	Low	Burger	1
6	Low	Burger	1
7	Low	Burger	1
8	Low	Burger	1
9	Low	Burger	1
10	Low	Burger	1
11	Medium	Burger	2
12	Medium	Burger	2
13	Medium	Burger	1
14	Medium	Burger	5
15	Medium	Burger	1
16	Medium	Burger	1
17	Medium	Burger	2
18	Medium	Burger	1
19	Medium	Burger	1
20	Medium	Burger	2
21	Medium	Burger	1
22	High	Burger	1
23	High	Burger	2

==========

[11]: What is the distribution of calories and total fat content for each menu item:

```sql
SELECT
  Menu, Calories, TotalFat,
  CASE
    WHEN Calories < 400 AND TotalFat < 20 THEN 'Low-Low'
    WHEN Calories < 400 AND TotalFat BETWEEN 20 AND 40 THEN 'Low-Medium'
    WHEN Calories < 400 AND TotalFat > 40 THEN 'Low-High'
    WHEN Calories BETWEEN 400 AND 600 AND TotalFat < 20 THEN 'Medium-Low'
    WHEN Calories BETWEEN 400 AND 600 AND TotalFat BETWEEN 20 AND 40 THEN 'Medium-Medium'
    WHEN Calories BETWEEN 400 AND 600 AND TotalFat > 40 THEN 'Medium-High'
    WHEN Calories > 600 AND TotalFat < 20 THEN 'High-Low'
    WHEN Calories > 600 AND TotalFat BETWEEN 20 AND 40 THEN 'High-Medium'
    ELSE 'High-High'
  END AS CalFatRange
FROM fastfood;
```

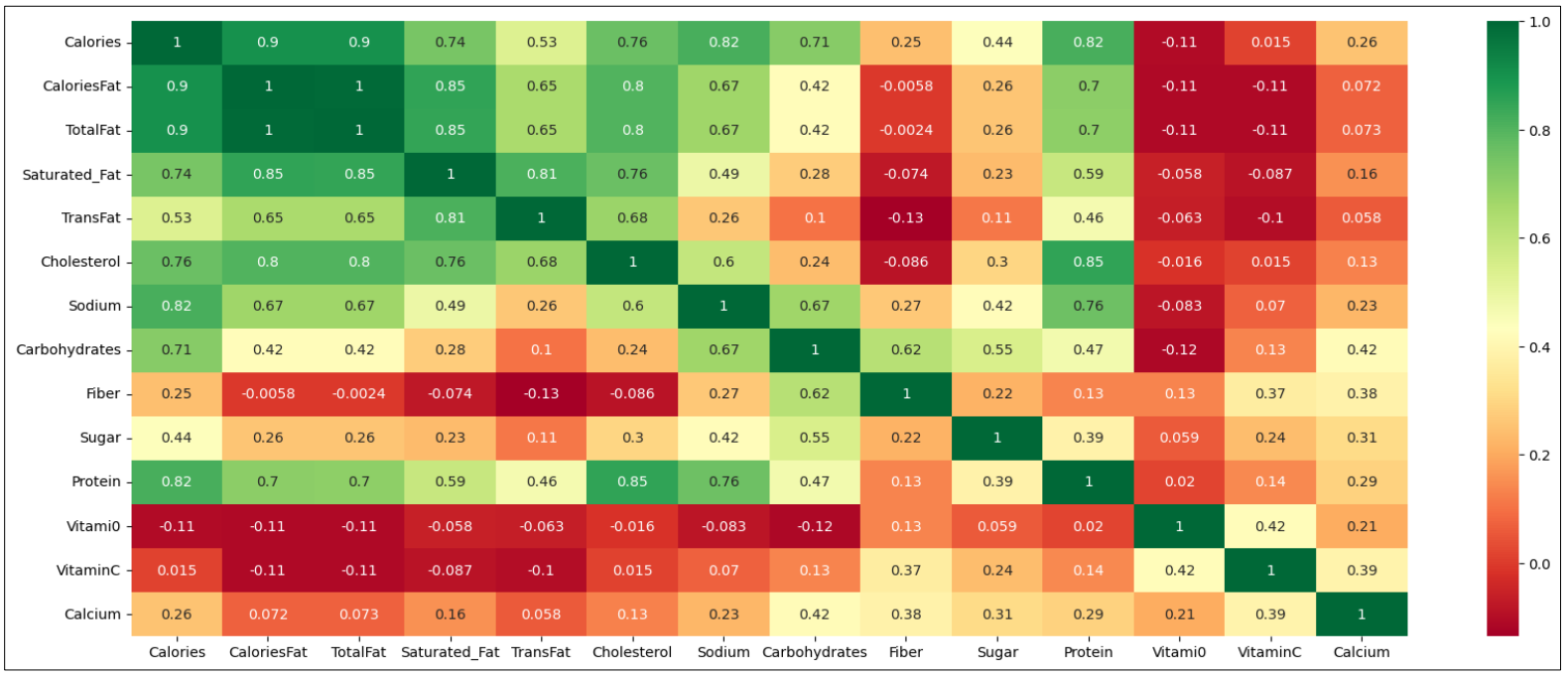
100 %

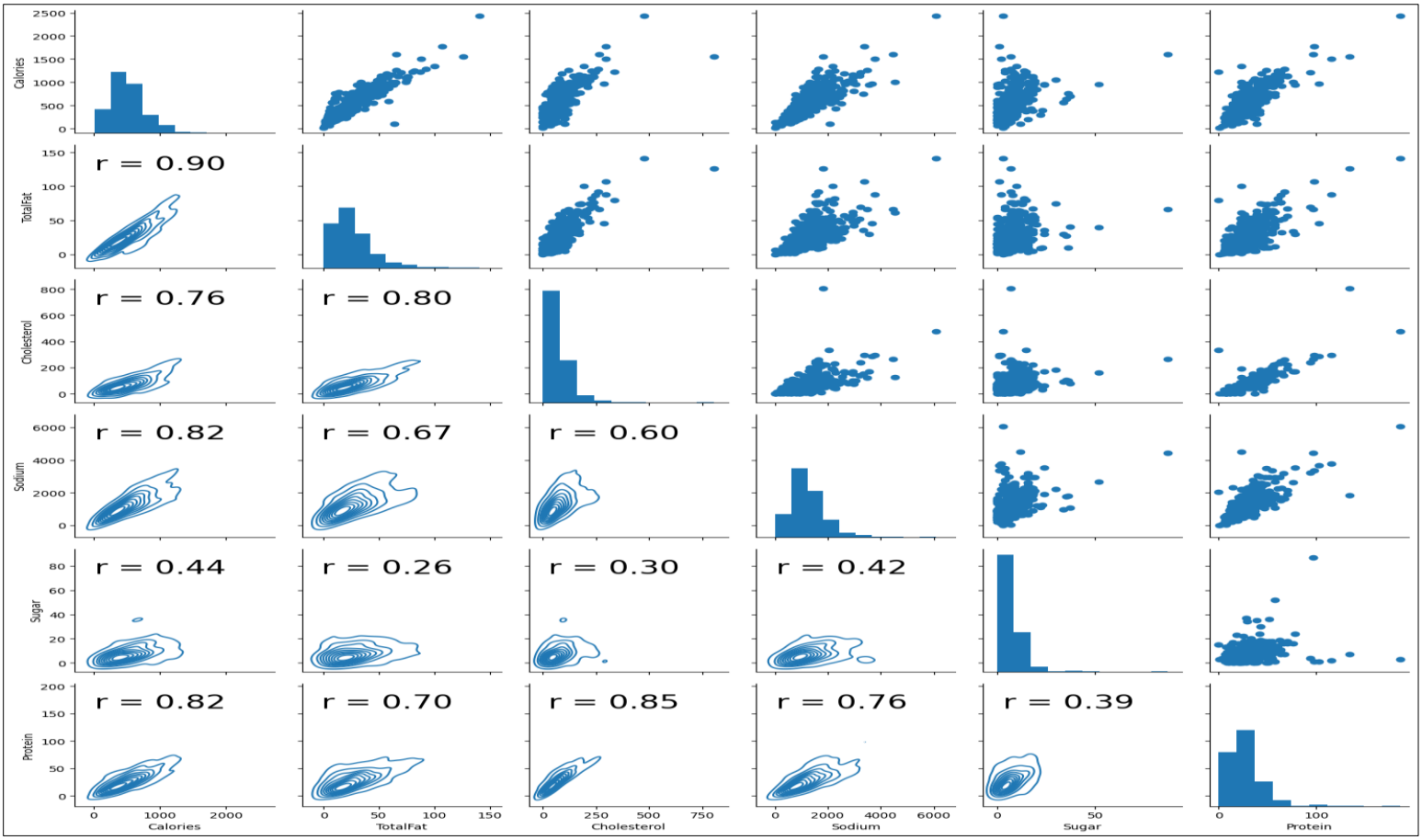
Results | Messages

	Menu	Calories	TotalFat	CalFatRange
1	Artisan Grilled Chicken Sandwich	380	7	Low-Low
2	Single Bacon Smokehouse Burger	840	45	High-High
3	Double Bacon Smokehouse Burger	1130	67	High-High
4	Grilled Bacon Smokehouse Chicken Sandwich	750	31	High-Medium
5	Crispy Bacon Smokehouse Chicken Sandwich	920	45	High-High
6	Big Mac	540	28	Medium-Medium
7	Cheeseburger	300	12	Low-Low
8	Classic Chicken Sandwich	510	24	Medium-Medium
9	Double Cheeseburger	430	21	Medium-Medium
10	Double Quarter Pounder® with Cheese	770	45	High-High
11	Filet-O-Fish®	380	18	Low-Low
12	Garlic White Cheddar Burger	620	34	High-Medium
13	Grilled Garlic White Cheddar Chicken Sandwich	530	20	Medium-Medium
14	Crispy Garlic White Cheddar Chicken Sandwich	700	34	High-Medium
15	Hamburger	250	8	Low-Low
16	Lobster Roll	290	5	Low-Low
17	Maple Bacon Dijon 1/4 lb Burger	640	36	High-Medium
18	Grilled Maple Bacon Dijon Chicken Sandwich	580	21	Medium-Medium
19	Crispy Maple Bacon Dijon Chicken Sandwich	740	35	High-Medium
20	McChicken	350	15	Low-Low
21	McDouble	380	18	Low-Low
22	McRib	480	22	Medium-Medium
23	Pico Guacamole 1/4 lb Burger	580	33	Medium-Medium

==========

[12]:What is the correlation between all the nutritional contents





[See Python Codes at the bottom]

==========

[13]: What the sum and the max nutrients content for the top 15 fatty foods for each menu item and restaurant:

```
SELECT Top 15
Restaurant, Menu,
       SUM(CaloriesFat) AS [Total Calories Fat],
       SUM(TotalFat) AS [Total Fat],
       SUM(Saturated_Fat) AS [Total Saturated Fat],
       MAX(TotalFat) AS [MAX Fat],
       MAX(Saturated_Fat) AS [MAX Saturated Fat],
       MAX(CaloriesFat) AS [MAX Calories Fat],
RANK() OVER (ORDER BY MAX(CaloriesFat) DESC) AS Rank
FROM fastfood
GROUP BY Restaurant, Menu
ORDER BY Rank;
```

100 %

Results | Messages

	Restaurant	Menu	Total Calories Fat	Total Fat	Total Saturated Fat	MAX Fat	MAX Saturated Fat	MAX Calories Fat	Rank
1	Mcdo0lds	20 piece Buttermilk Crispy Chicken Tenders	1270	141	24	141	24	1270	1
2	Burger King	American Brewhouse King	1134	126	47	126	47	1134	2
3	Mcdo0lds	40 piece Chicken McNuggets	960	107	18	107	18	960	3
4	Sonic	Garlic Parmesan Dunked Ultimate Chicken Sandwich	900	100	17	100	17	900	4
5	Sonic	Super Sonic Bacon Double Cheeseburger (w/mayo)	830	92	36	92	36	830	5
6	Mcdo0lds	12 piece Buttermilk Crispy Chicken Tenders	790	88	15	88	15	790	6
7	Sonic	Super Sonic Double Cheeseburger W/ Mayo	780	87	34	87	34	780	7
8	Burger King	Rodeo King	738	82	31	82	31	738	8
9	Burger King	Farmhouse King	720	80	28	80	28	720	9
10	Sonic	Super Sonic Double Cheeseburger W/ Mustard	680	76	32	76	32	680	10
11	Sonic	Super Sonic Jalapeno Double Cheeseburger	680	76	32	76	32	680	10
12	Sonic	Super Sonic Double Cheeseburger W/ Ketchup	680	76	32	76	32	680	10
13	Burger King	BBQ Bacon King	675	75	29	75	29	675	13
14	Dairy Queen	Large Cheese Curds	670	75	43	75	43	670	14
15	Burger King	Steakhouse King	666	74	24	74	24	666	15

[14]. What is the distribution of total fat content across different types of menu items?

```
SELECT
  CASE
    WHEN Menu LIKE '%burger%' THEN 'Burger'
    WHEN Menu LIKE '%sandwich%' THEN 'Sandwich'
    WHEN Menu LIKE '%salad%' THEN 'Salad'
    ELSE 'Other'
  END AS MenuType,
  TotalFat
FROM fastfood;
```

100 %

Results | Messages

	MenuType	TotalFat
1	Sandwich	7
2	Burger	45
3	Burger	67
4	Sandwich	31
5	Sandwich	45
6	Other	28
7	Burger	12
8	Sandwich	24
9	Burger	21
10	Other	45
11	Other	18
12	Burger	34
13	Sandwich	20
14	Sandwich	34
15	Burger	8

==========

[15]: What are the average nutrients for the top 20 menu items for each restaurant:

```
SELECT Top 20
Restaurant, Menu,
       AVG(Calories) AS [Avg Calories],
       AVG(TotalFat) AS [AvgTotal Fat],
       AVG(Cholesterol) AS [AvgCholesterol],
       AVG(Saturated_Fat) AS [avg Saturated Fat],
       AVG(CaloriesFat) AS [Avg Calories Fat],
       AVG(Protein) AS [Avg Protein],
       AVG(Sodium) AS [Avg Sodium],
RANK() OVER (ORDER BY AVG(Sodium) DESC) AS Rank
FROM fastfood
GROUP BY Restaurant, Menu
ORDER BY Rank;
```

100 %

Results | Messages

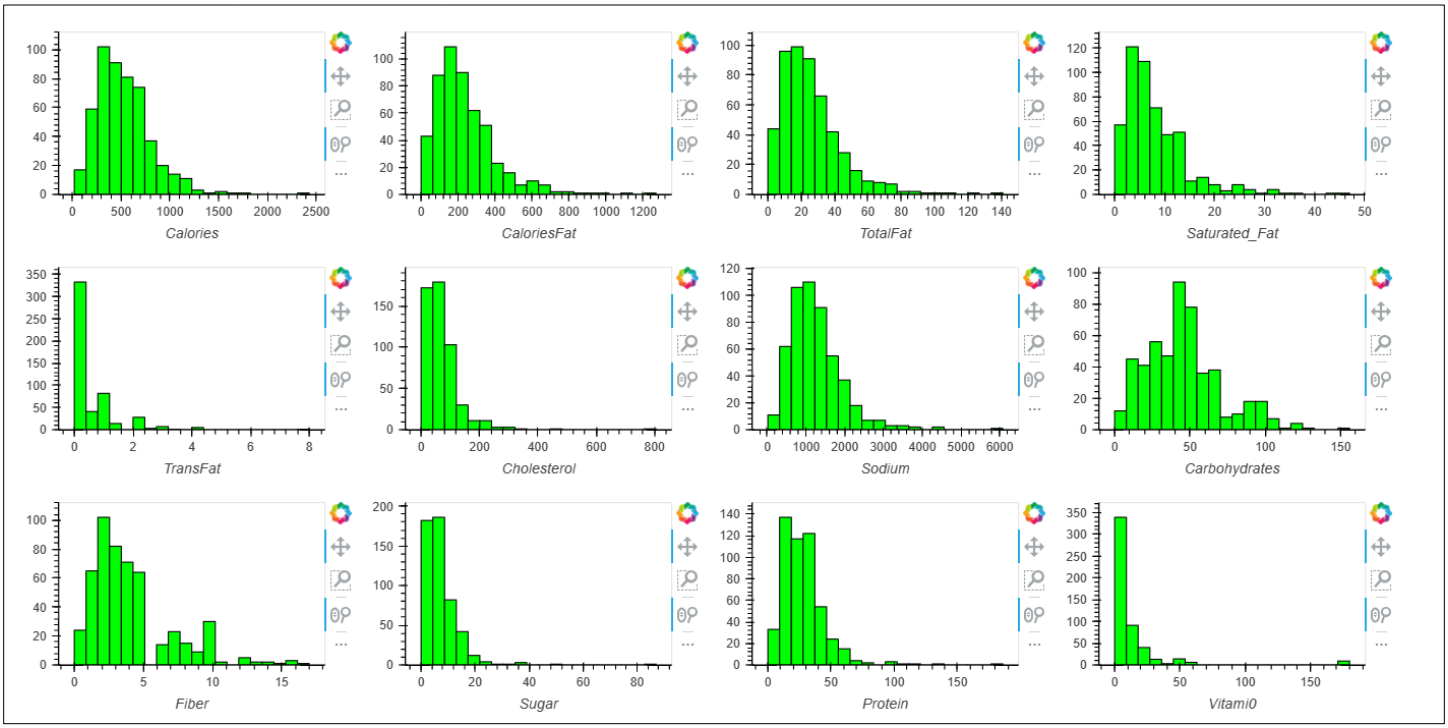
	Restaurant	Menu	Avg Calories	AvgTotal Fat	AvgCholesterol	avg Saturated Fat	Avg Calories Fat	Avg Protein	Avg Sodium	Rank
1	Mcdo0lds	20 piece Buttermilk Crispy Chicken Tenders	2430	141	475	24	1270	186	6080	1
2	Sonic	Buffalo Dunked Ultimate Chicken Sandwich	1000	61	125	12	550	23	4520	2
3	Mcdo0lds	10 piece Sweet N' Spicy Honey BBQ Glazed Tenders	1600	66	265	10	600	97	4450	3
4	Mcdo0lds	12 piece Buttermilk Crispy Chicken Tenders	1510	88	295	15	790	115	3770	4
5	Chick Fil-A	30 piece Chicken Nuggets	970	46	285	2.5	414	103	3660	5
6	Subway	Footlong Corned Beef Reuben	940	30	170	9	260	78	3540	6
7	Dairy Queen	6 Piece Chicken Strip Basket w/ Country Gravy	1260	66	120	11	590	49	3500	7
8	Mcdo0lds	40 piece Chicken McNuggets	1770	107	295	18	960	98	3370	8
9	Arbys	Half Pound French Dip & Swiss	750	36	150	17	330	55	3350	9
10	Mcdo0lds	10 piece Buttermilk Crispy Chicken Tenders	1210	70	240	12	630	94	3230	10
11	Subway	Footlong Carved Turkey & Bacon w/ Cheese	1140	52	140	14	460	66	3200	11
12	Subway	Footlong Spicy Italian	960	48	100	18	440	40	3040	12
13	Subway	Turkey, Bacon & Guacamole Wrap	810	42	75	13	380	43	2970	13
14	Subway	Footlong Turkey Italiano Melt (with Provolone)	980	48	100	18	420	48	2960	14
15	Arbys	Triple Decker Sandwich	1030	51	155	17	459	62	2940	15
16	Subway	Footlong Big Hot Pastrami	1160	62	170	22	620	58	2940	15
17	Subway	Footlong Italian Hero	1100	58	150	20	520	52	2940	15
18	Dairy Queen	4 Piece Chicken Strip Basket w/ Country Gravy	1030	53	80	9	480	35	2780	18
19	Mcdo0lds	6 piece Sweet N' Spicy Honey BBQ Glazed Tenders	960	40	160	6	360	58	2670	19
20	Subway	Footlong Big Philly Cheesesteak	1000	34	170	18	300	76	2620	20

==========

[16]: What is the nature of the distribution of all the nutritional content across Restaurants

==========

[16a]: Histogram Showing the Distribution of the Nutritional Variables



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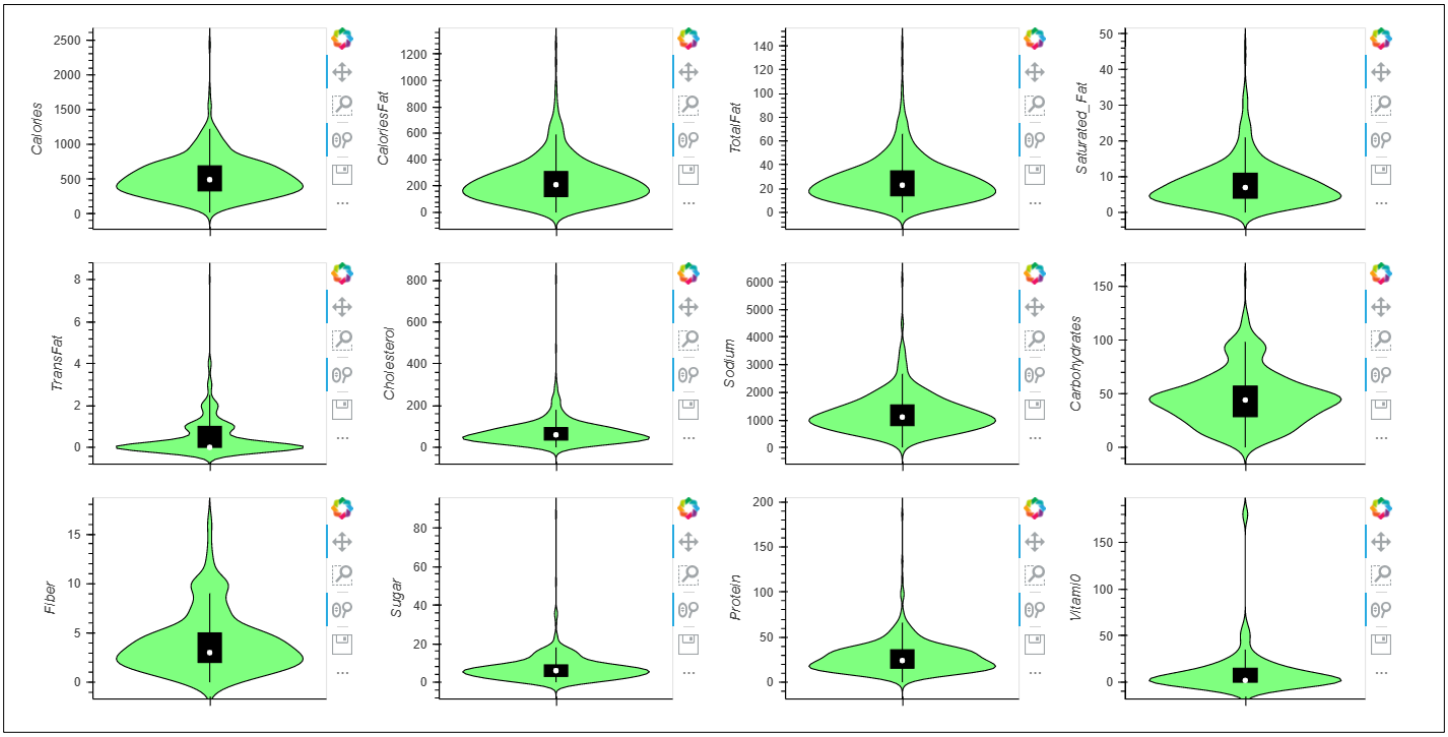
[16b]: Violin Plots Showing the Distribution of the Nutritional Variables



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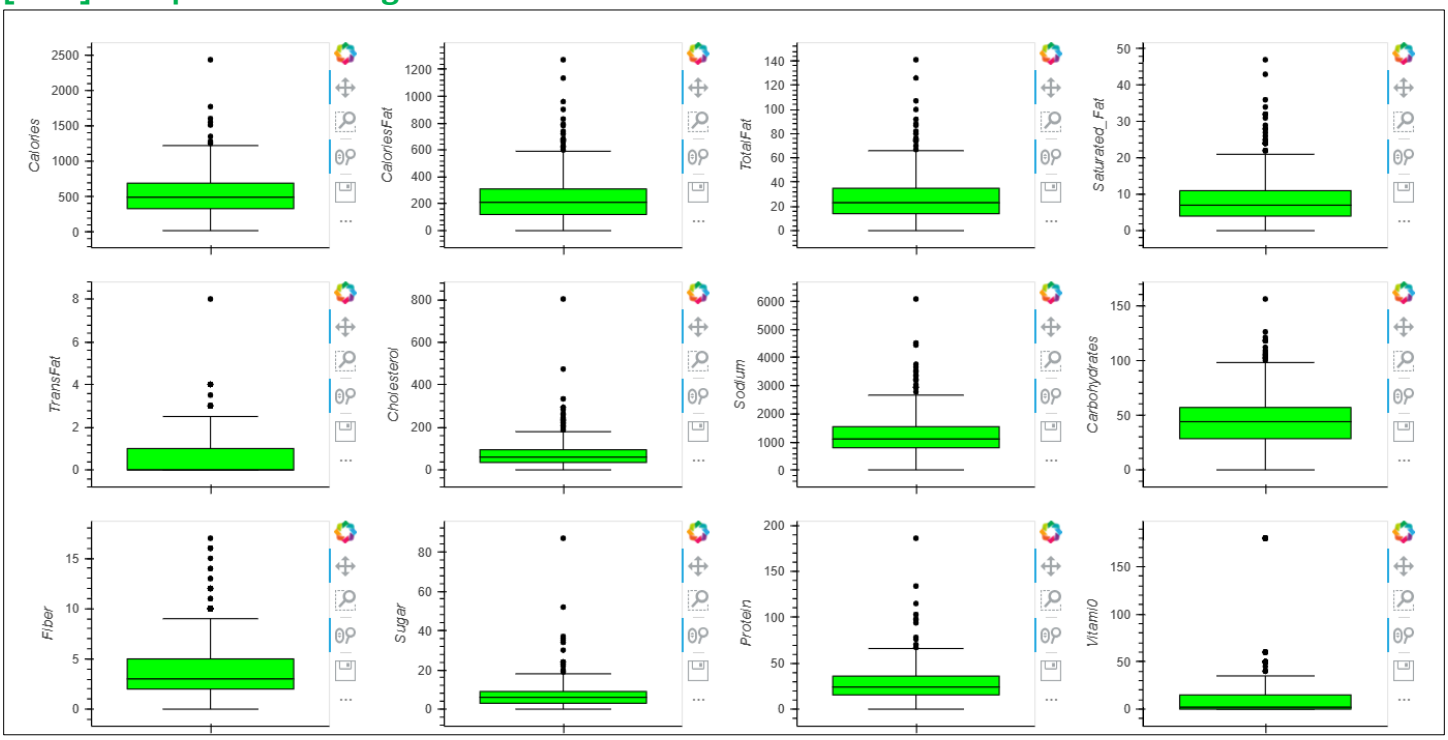
[16c]:Boxplot Showing the Distribution of the Nutritional Variables



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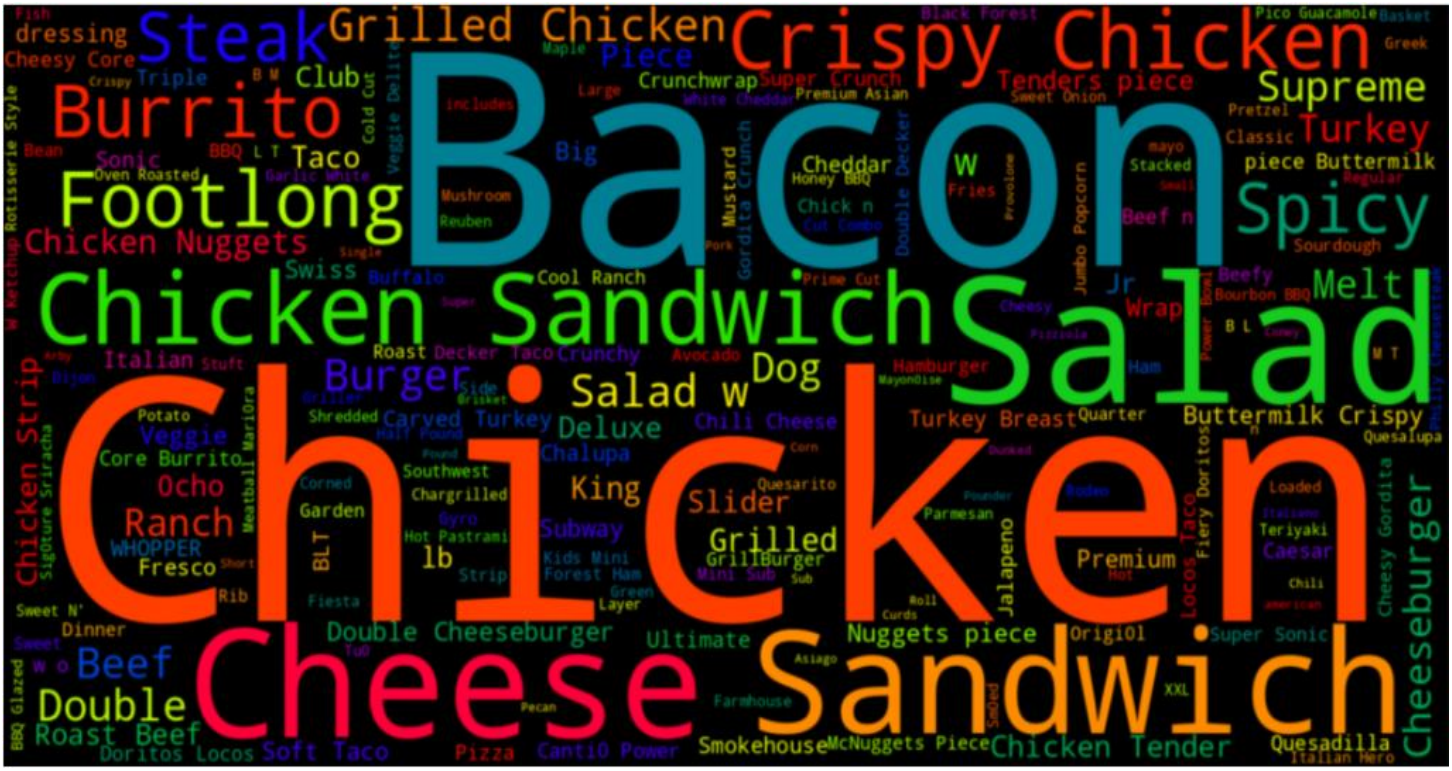
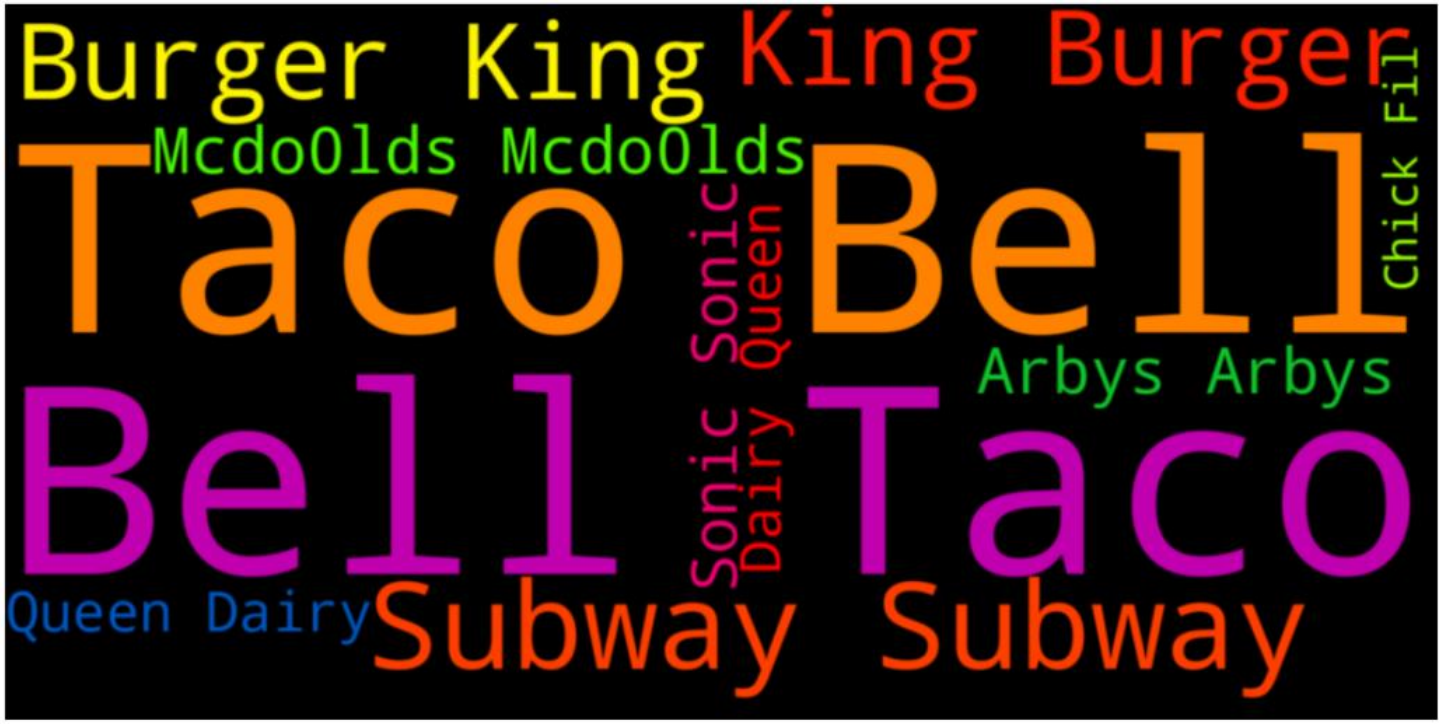
[17]: Which of these Menu Items appears most (WordCroud)across Restaurants?



==========

[17b]: Which of these Restaurants appears most (WordCroud)across Menu Items



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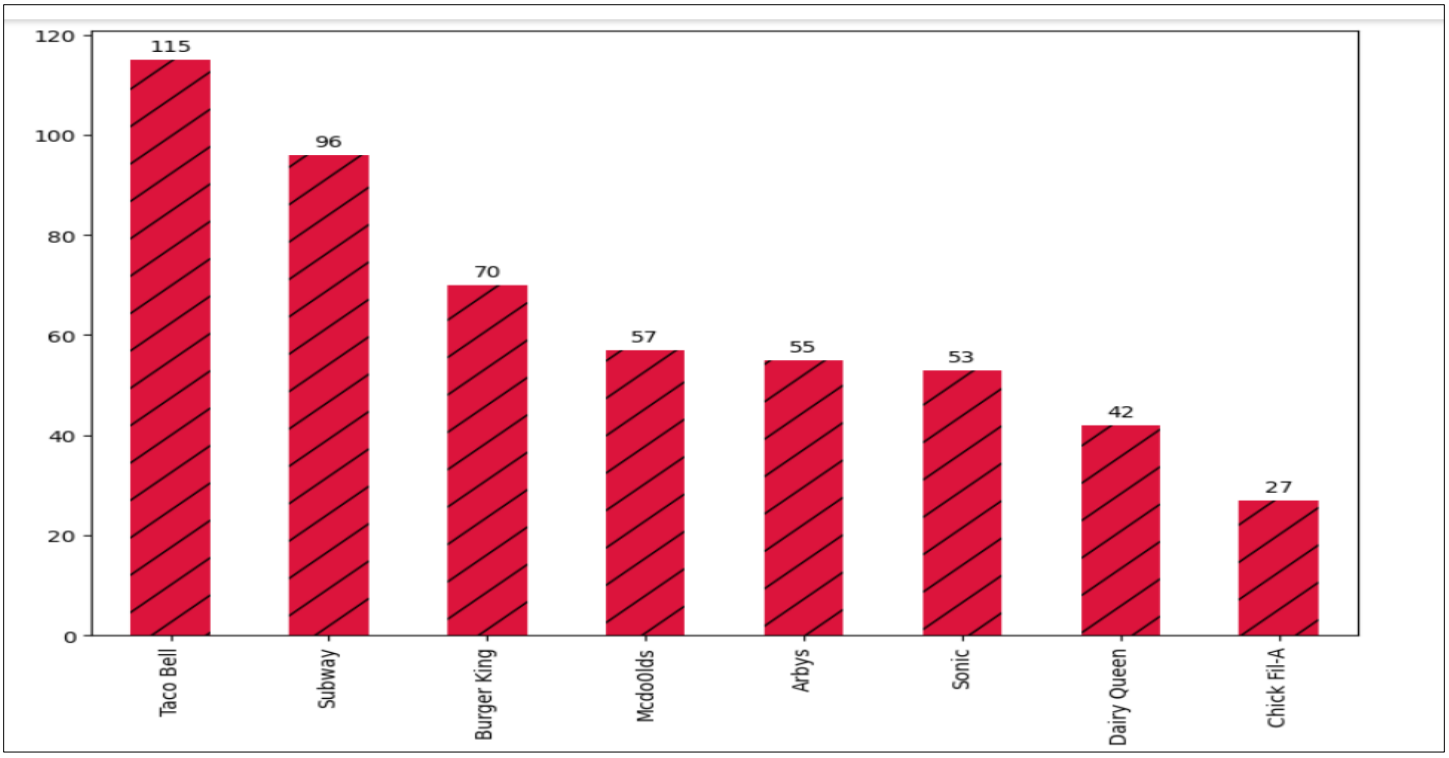
[17c]:How many Restaurants do we have across Menu Items



Appendix: Other Fancy SQL Queries to Try

==========

[18]. Pivot table showing the breakdown of menu categories by type of fat for all menu items:

```
SELECT
    CASE
        WHEN Salad = 1 THEN 'Salad'
        ELSE 'Non-salad'
    END AS Category,
    SUM(CASE WHEN Saturated_Fat > 0 THEN 1 ELSE 0 END) AS SaturatedFat,
    SUM(CASE WHEN TransFat > 0 THEN 1 ELSE 0 END) AS TransFat,
    SUM(CASE WHEN TotalFat - Saturated_Fat - TransFat > 0 THEN 1 ELSE 0 END) AS OtherFat
FROM fastfood
GROUP BY Category
```

==========

[19]Pivot table showing the difference in nutrient values between two specific menu items:

```
SELECT Menu, Calories, TotalFat, Saturated_Fat, TransFat,
       Cholesterol, Sodium, Carbohydrates, Fiber, Sugar, Protein
FROM fastfood
WHERE Menu IN ('Menu Item 1', 'Menu Item 2')
```

==========

[20]Pivot table showing the breakdown of calories by type of fat and menu category for each restaurant:

```
SELECT Restaurant, Menu, SUM(Calories) AS Calories,
       Saturated_Fat, TransFat, TotalFat,
       CASE
           WHEN Salad = 1 THEN 'Salad'
           ELSE 'Non-salad'
       END AS Salad
FROM fastfood
GROUP BY Restaurant, Menu, Salad
ORDER BY Restaurant, Salad, Calories DESC
```

==========

[21]:A pivot table showing the distribution of nutrient values for each restaurant:

```
SELECT Restaurant,
       MaX(Calories) AS AvgCalories,
       MAX(TotalFat) AS AvgTotalFat,
       MAX(Saturated_Fat) AS AvgSatFat,
       MaX(Cholesterol) AS AvgCholesterol,
       MAX(Sodium) AS AvgSodium,
       MAX(Carbohydrates) AS AvgCarbs,
       MAX(Fiber) AS AvgFiber,
       MAX(Sugar) AS AvgSugar,
       MAX(Protein) AS AvgProtein
FROM fastfood
GROUP BY Restaurant
```

==========

==========

[22]: A pivot table showing the connections between menu items based on their nutrient values:

```
WITH similarities AS (
  SELECT f1.Menu as menu1, f2.Menu as menu2,
         ABS(f1.Calories - f2.Calories) + ABS(f1.TotalFat - f2.TotalFat) + ABS(f1.Cholesterol -
f2.Cholesterol) as similarity_score
  FROM fastfood f1
  JOIN fastfood f2 ON f1.Menu != f2.Menu
  WHERE f1.Restaurant = '<selected restaurant>' AND f2.Restaurant = '<selected restaurant>'
)
SELECT menu1, menu2, similarity_score
FROM similarities
WHERE similarity_score > 0
ORDER BY similarity_score DESC;
```

==========

[23]: Pivot table showing the hierarchy of menu categories for a specific restaurant:

```
WITH RECURSIVE menu_hierarchy (id, menu, parent_id, level) AS (
  SELECT ID, Menu, NULL, 0
  FROM fastfood
  WHERE Restaurant = '<selected restaurant>' AND Parent IS NULL
  UNION ALL
  SELECT f.ID, f.Menu, f.Parent, mh.level + 1
  FROM fastfood f
  JOIN menu_hierarchy mh ON f.Parent = mh.id
)
SELECT id, menu, parent_id, level
FROM menu_hierarchy;
```

==========

[24]: Pivot table the flow of nutrients from different food groups to the final menu items:

```
SELECT Menu,
SUM(Calories) as total_calories,
SUM(Protein) as total_protein,
SUM(Fat) as total_fat
FROM (
  SELECT Menu, Calories, Protein, TotalFat + Saturated_Fat + TransFat as Fat
  FROM fastfood
) as nutrients
GROUP BY Menu;
```

==========

==========

[25]:Pivot table showing the nutrient values for a specific menu item compared to the average values across all menu items:

```
SELECT 'Selected Item' as item name,
       Calories, CaloriesFat, TotalFat, Saturated_Fat, TransFat, Cholesterol, Sodium, Carbohydrates,
Fiber, Sugar, Protein, VitaminA, VitaminC, Calcium
FROM fastfood
WHERE Menu = '<selected menu item>'
UNION
SELECT 'Average' as item name,
       MAX(Calories),
          MAX(CaloriesFat),
          AVG(TotalFat),
          AVG(Saturated_Fat),
          AVG(TransFat),
          AVG(Cholesterol),
          AVG(Sodium),
          AVG(Carbohydrates),
          AVG(Fiber),
          AVG(Sugar),
          AVG(Protein),
          AVG(Vitami0),
          AVG(VitaminC),
          AVG(Calcium)
FROM fastfood;
```

==========

To access the full Python notebook with detailed comments for each chart and table in the analysis, click on the link here: [Hayford GitHub Data Science Certification Projects]

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