Nutrition Facts for McDonald's Menu

1st Challenge Presented by Group 1

i'm lovin' it™

Group Members

Agung Besti

0151425121-13

Alifia Listu Samatha

151425120-30

Anindya Widi

151425120-44

Overview of the Challenge

McDonald's Data Content

This dataset provides a nutrition analysis of every menu item on the US McDonald's menu, including breakfast, beef burgers, chicken and fish sandwiches, fries, salads, soda, coffee and tea, milkshakes, and desserts.

5 Questions to Answer !

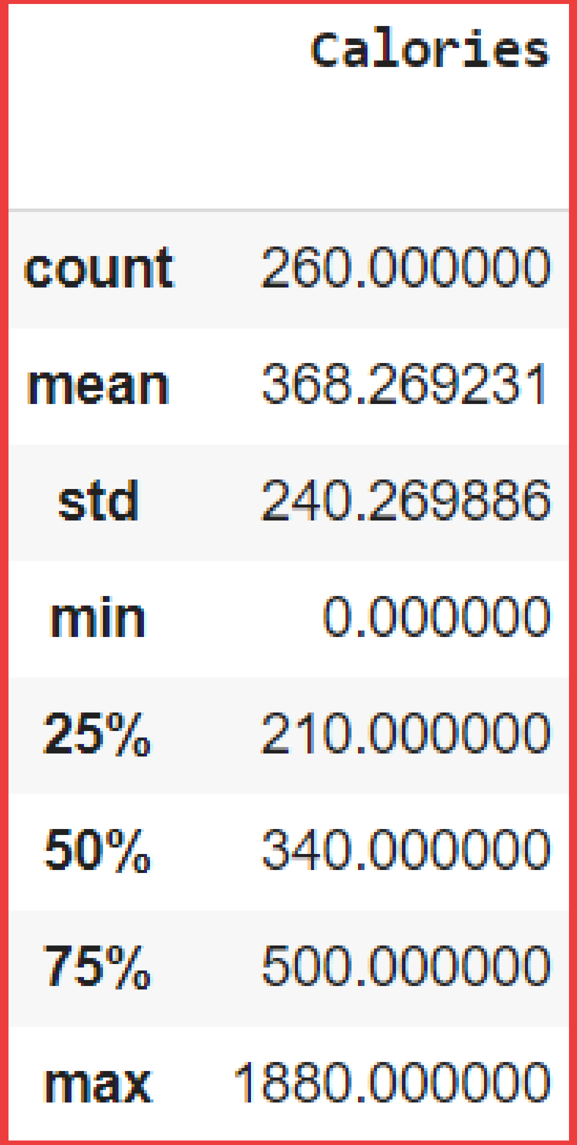
- How many calories does the average McDonald's value meal contain?
- How much do beverages, like soda or coffee, contribute to the overall caloric intake?
- Does ordered grilled chicken instead of crispy increase a sandwich's nutritional value?
- What about ordering egg whites instead of whole eggs?
- What is the least number of items could you order from the menu to meet one day's nutritional requirements?

QUESTION 1:

How many calories does the average McDonald's Value Meal Content?

df.describe()

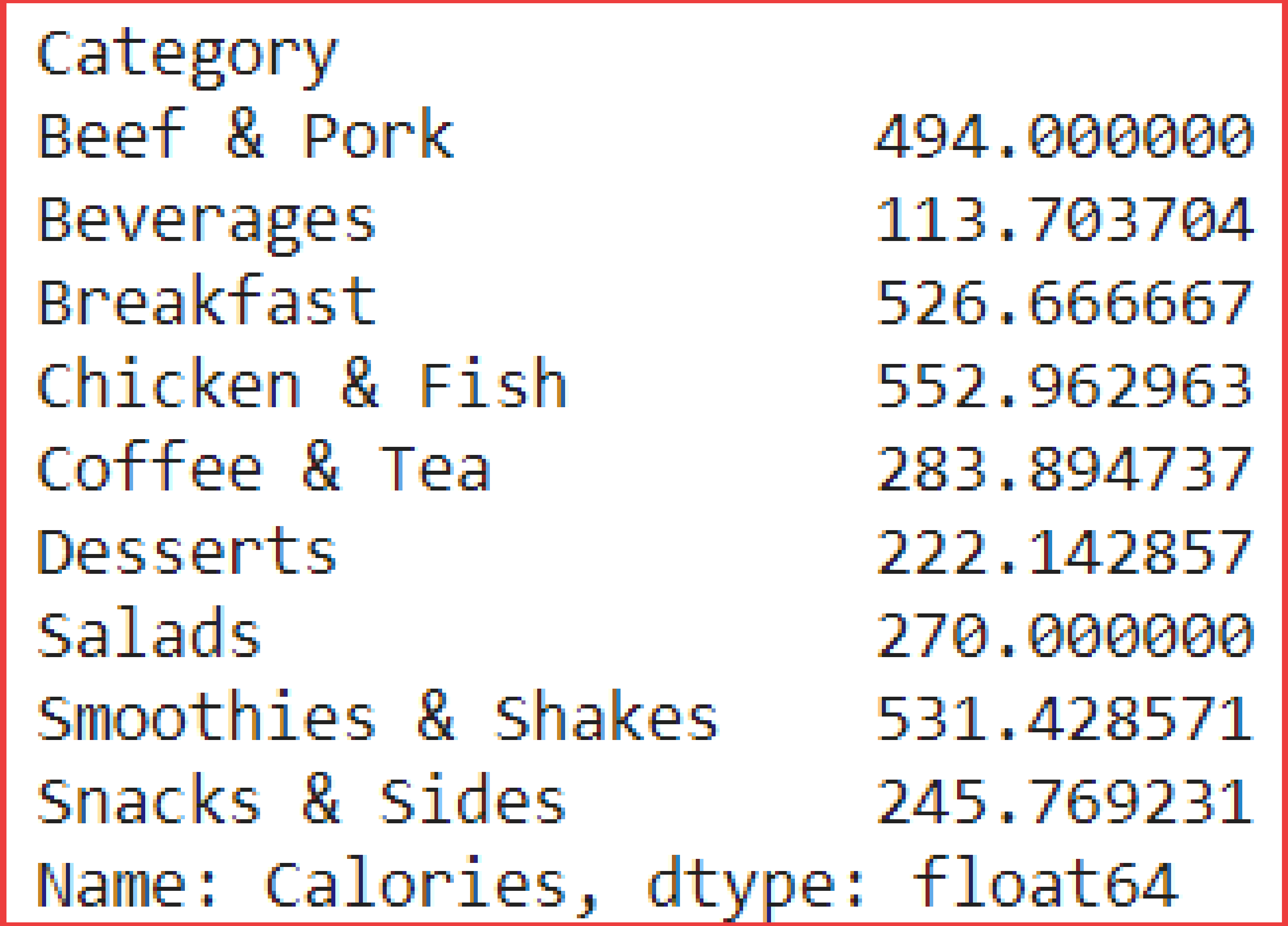
with this method we could see the mean or average calories for each columns.



	Calories
count	260.000000
mean	368.269231
std	240.269886
min	0.000000
25%	210.000000
50%	340.000000
75%	500.000000
max	1880.000000

df.groupby(['Category'])['Calories'].mean()

with this method we could see the average calories for each unique category in the menu.



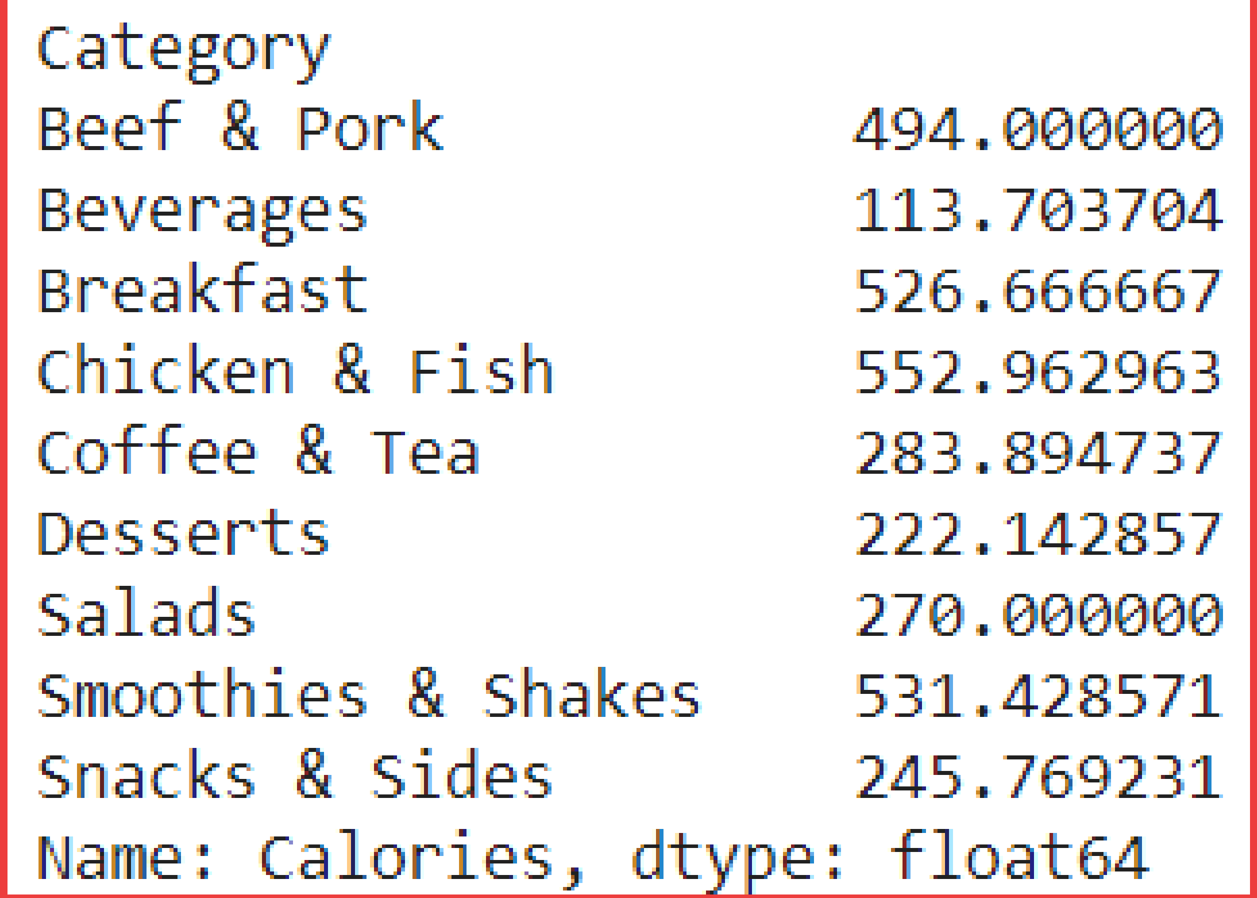
```
Category
Beef & Pork           494.000000
Beverages             113.703704
Breakfast             526.666667
Chicken & Fish        552.962963
Coffee & Tea          283.894737
Desserts              222.142857
Salads                270.000000
Smoothies & Shakes    531.428571
Snacks & Sides        245.769231
Name: Calories, dtype: float64
```

```
mcd_meal = df.set_index('Category')
mcd_meal = mcd_meal.drop(['Beverages', 'Coffee & Tea', 'Smoothies & Shakes'],axis=0)
```

drop beverages columns because we want to know the average calories of the meal.

```
mcd_meal_avgcal = mcd_meal.groupby(['Category'])['Calories'].mean()
mcd_meal_avgcal
```

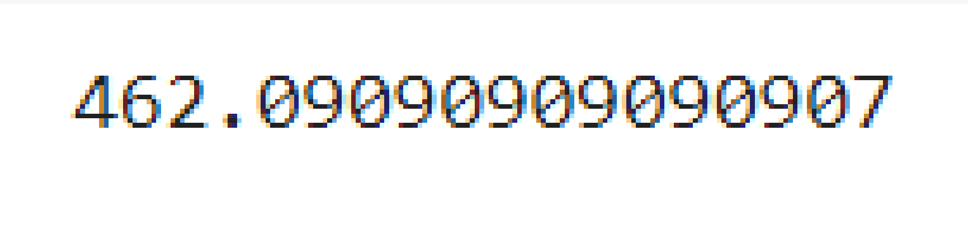
with this method we could see the mean for each unique category in the menu without the beverages.



```
Category
Beef & Pork           494.000000
Beverages             113.703704
Breakfast             526.666667
Chicken & Fish        552.962963
Coffee & Tea          283.894737
Desserts              222.142857
Salads                270.000000
Smoothies & Shakes    531.428571
Snacks & Sides        245.769231
Name: Calories, dtype: float64
```

```
mcd_meal['Calories'].mean()
```

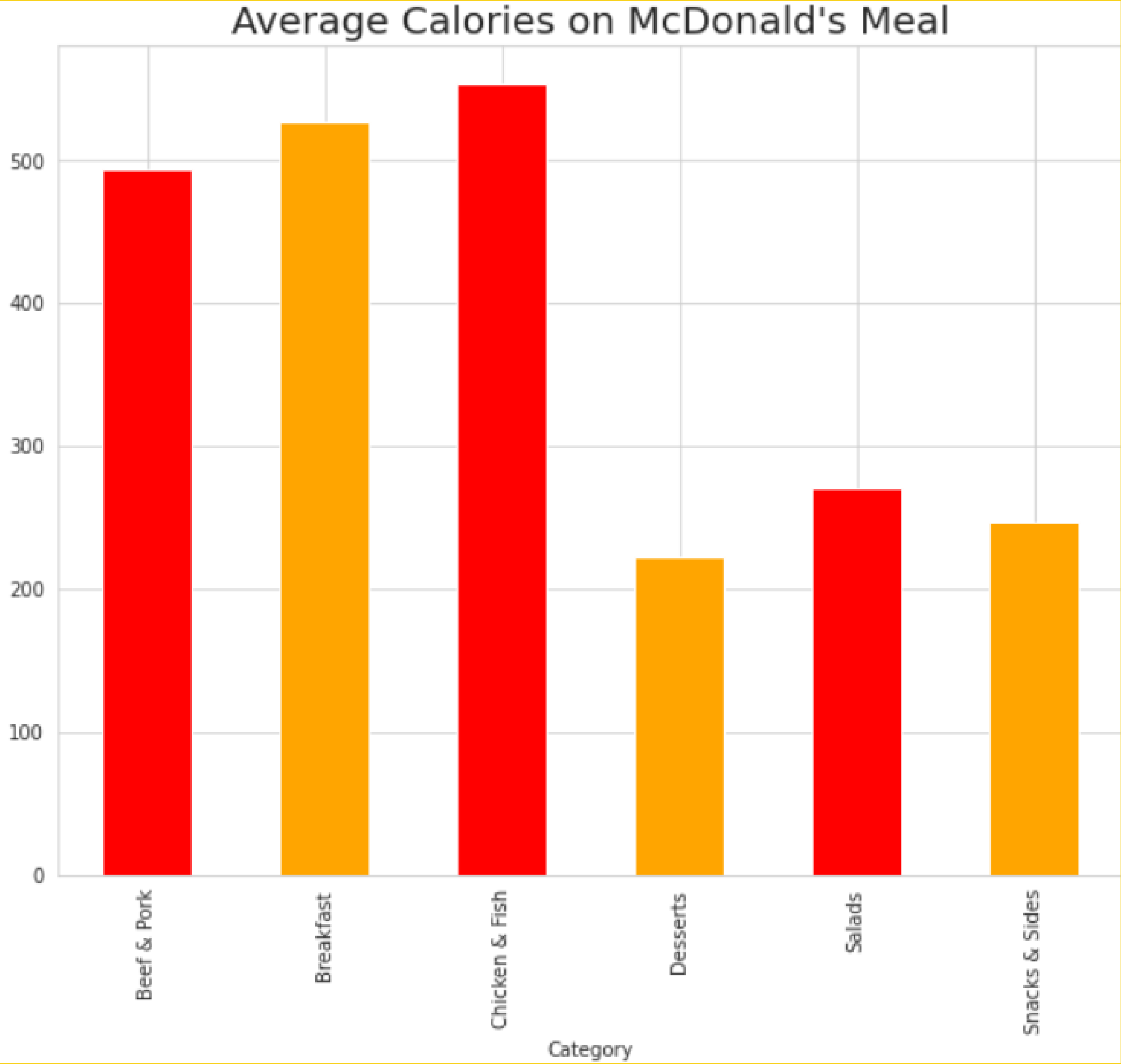
with this method we could see the overall calories in McDonald's meal.



```
462.09090909090907
```

Visualization

with Bar Plot



From here, we know that chicken and fish has the highest average calories while desserts has the lowest average calories.

QUESTION 2:
How much do beverages, like soda or coffee, contribute to the overall caloric intake?

ASSUMPTION
DAILY CALORIC INTAKE = 2,000 CALORIES

```
df['% Overall Daily Calories Intake'] = df['Calories']/2000*100
```

insert new column (% Overall Daily Calories Intake) which values calculated from other column (Calories).

```
minuman = df.loc[df['Category'].isin(['Beverages','Coffee & Tea','Smoothies & Shakes'])]
minuman.head()
```

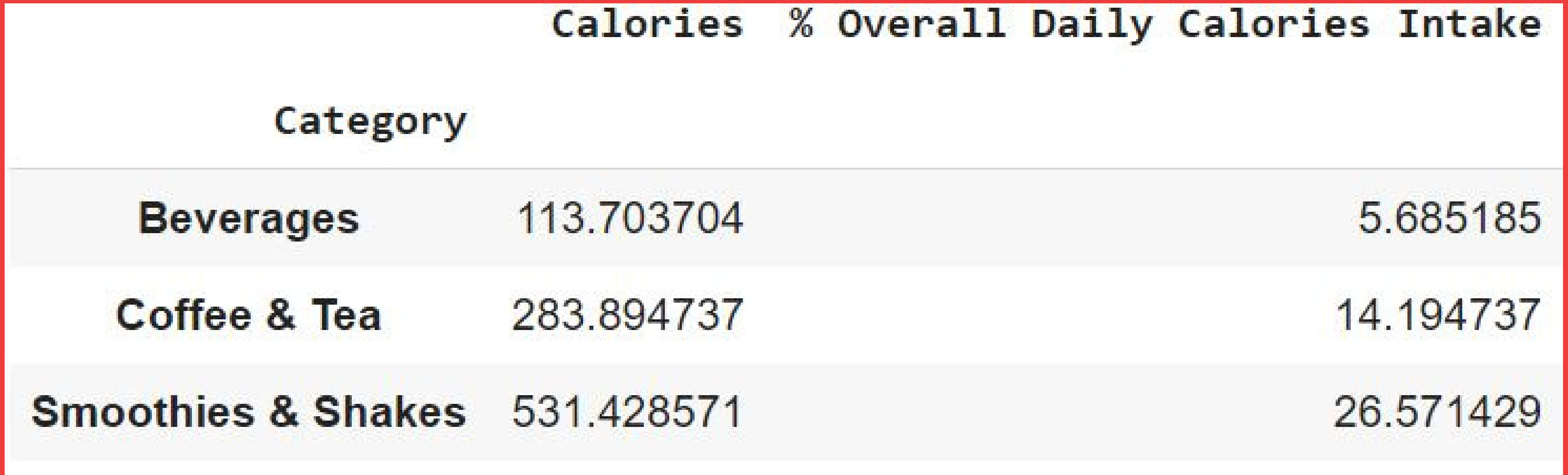
show only rows with beverages (Beverages, Coffee & Tea, Smoothies & Shakes) as its category.

```
minuman = minuman[['Category', 'Item', 'Calories', '% Overall Daily Calories Intake', 'Serving Size', ...]]
```

rearrange column by placing the new added column at the fourth place.

```
beve = minuman.groupby('Category')['Calories','% Overall Daily Calories Intake'].mean()
bev = pd.DataFrame(beve)
bev
```

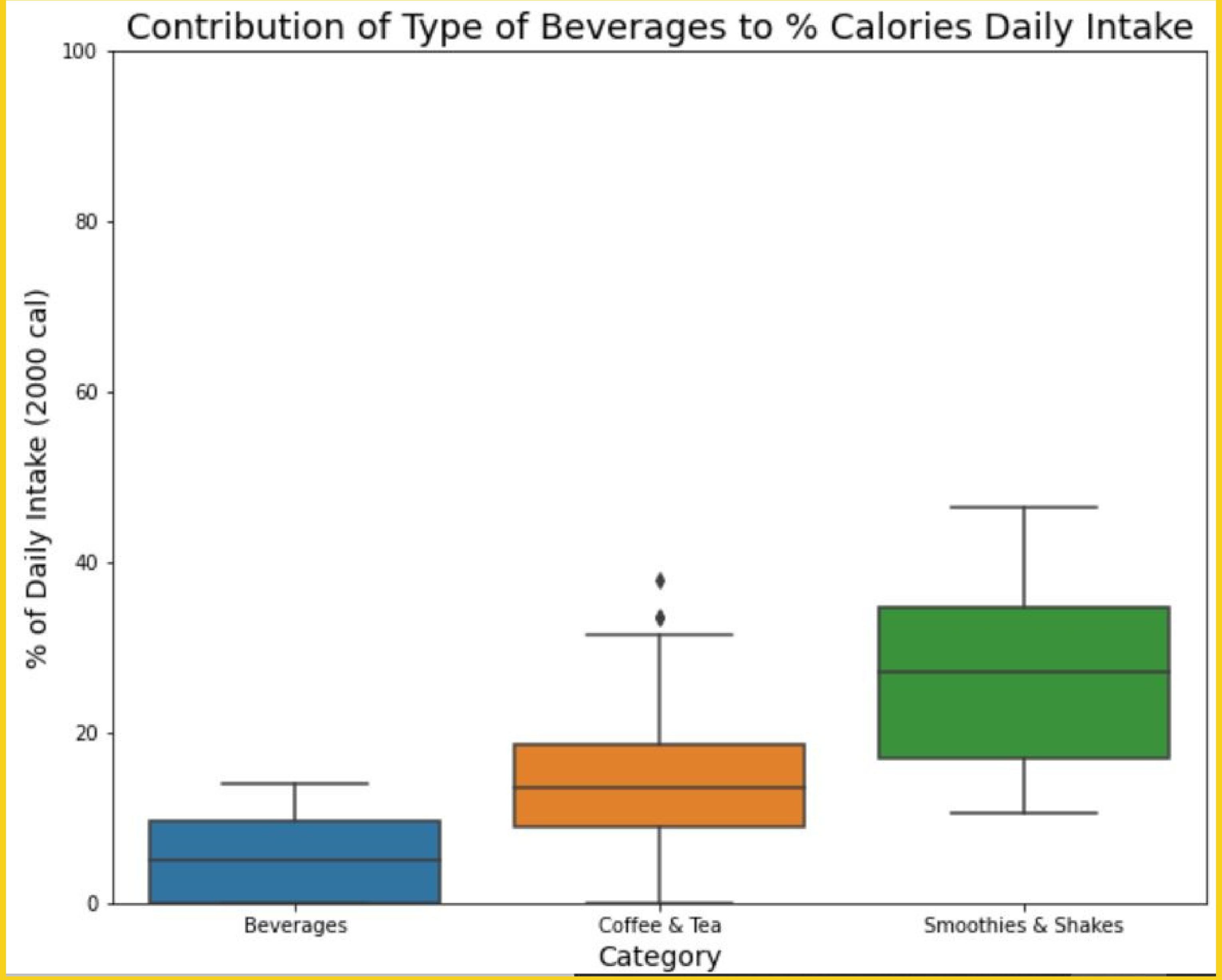
show summary of the 3 categories in average.



```
                      Calories  % Overall Daily Calories Intake
          Category
       Beverages    113.703704                         5.685185
      Coffee & Tea  283.894737                        14.194737
Smoothies & Shakes  531.428571                        26.571429
```

Visualization

with Box Plot



From the graph, we can conclude that Smoothies & Shakes is category with greatest contributions to the % Daily Intake compared to other two beverage categories.

QUESTION 3:
Does ordered grilled chicken instead of crispy increase a sandwich's nutritional value?

```
df_chicken = df[df['Item'].str.contains('Chicken', regex=False)]
```

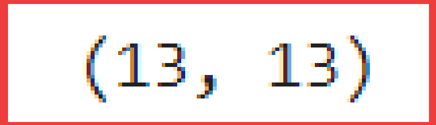
Choose from the 'Item' column where the string contain 'Chicken' in it, because we want to see the menu with chicken.

```
df_chicken_nut = df_chicken.drop(['Category', 'Serving Size', 'Calories', 'Calories from Fat',
'Total Fat', 'Total Fat (% Daily Value)', 'Saturated Fat', 'Saturated Fat (% Daily Value)', 'Trans Fat',
'Cholesterol', 'Cholesterol (% Daily Value)','% Overall Daily Calories Intake'], axis=1)
```

Drop column that is not a part of nutrition value.

```
df_grilledchicken_nut = df_chicken_nut[df_wholeegg_nut['Item'].str.contains('Grilled', regex=False)]
df_grilledhicken_nut.shape
```

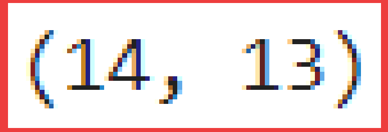
Choose from the 'Item' column wher the string contain 'Grilled' in it for menu with grilled chicken.



```
(13, 13)
```

```
df_crispychicken_nut = df_chicken_nut[df_wholeegg_nut['Item'].str.contains('Crispy', regex=False)]
df_crispychicken_nut.shape
```

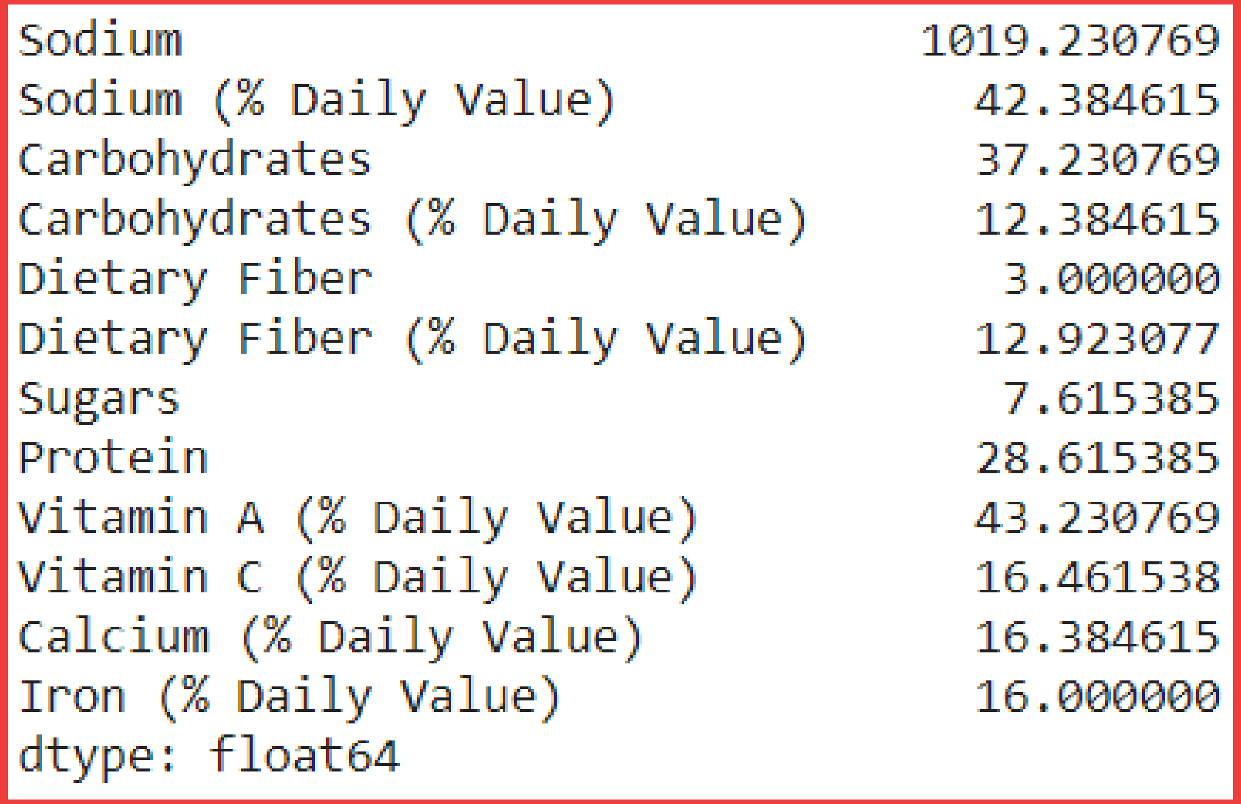
Choose from the 'Item' column wher the string contain 'Crispy' in it for menu with crispy chicken.



```
(14, 13)
```

df_grilledchicken_nut.mean()

the average nutrition in grilled chicken.

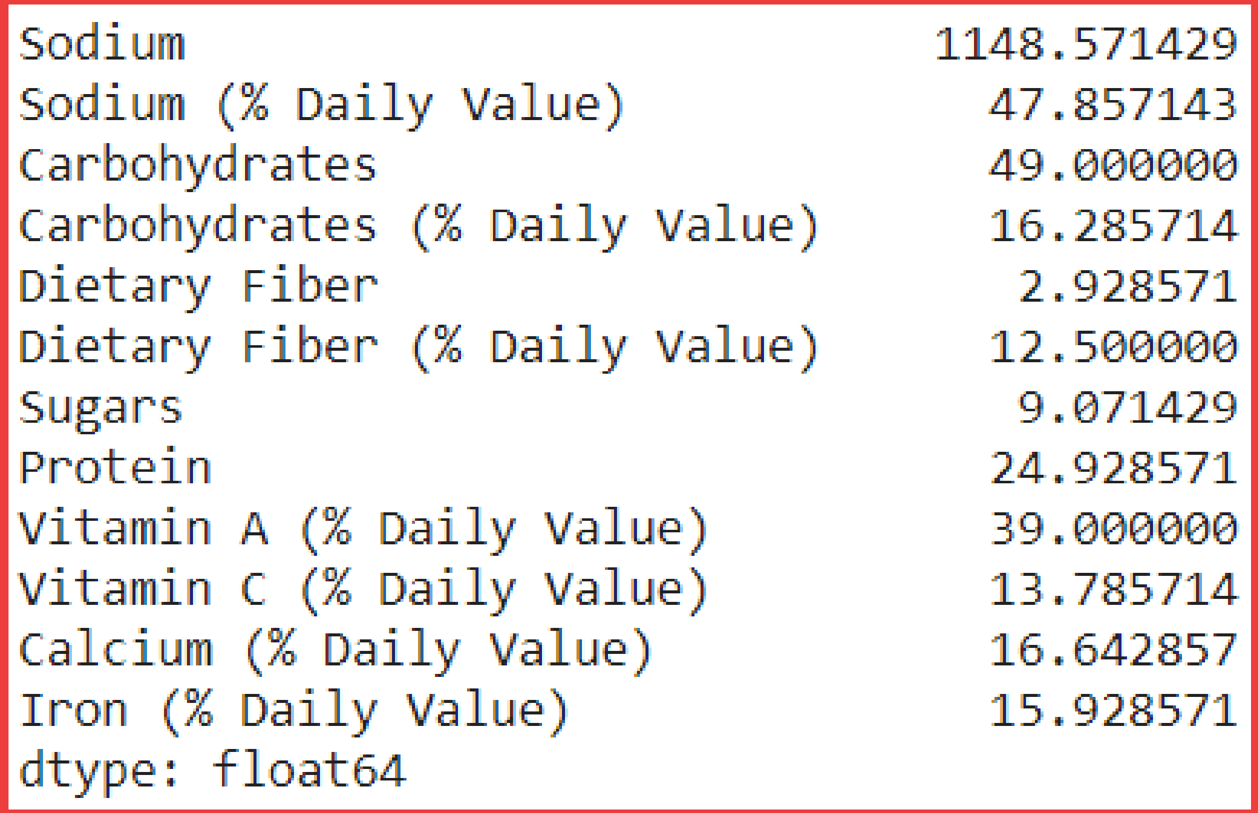


```
Sodium                           1019.230769
Sodium (% Daily Value)             42.384615
Carbohydrates                      37.230769
Carbohydrates (% Daily Value)      12.384615
Dietary Fiber                       3.000000
Dietary Fiber (% Daily Value)      12.923077
Sugars                              7.615385
Protein                            28.615385
Vitamin A (% Daily Value)          43.230769
Vitamin C (% Daily Value)          16.461538
Calcium (% Daily Value)            16.384615
Iron (% Daily Value)               16.000000
dtype: float64
```

grilledchicken.round()

df_crispychicken_nut.mean()

the average nutrition in crispy chicken.

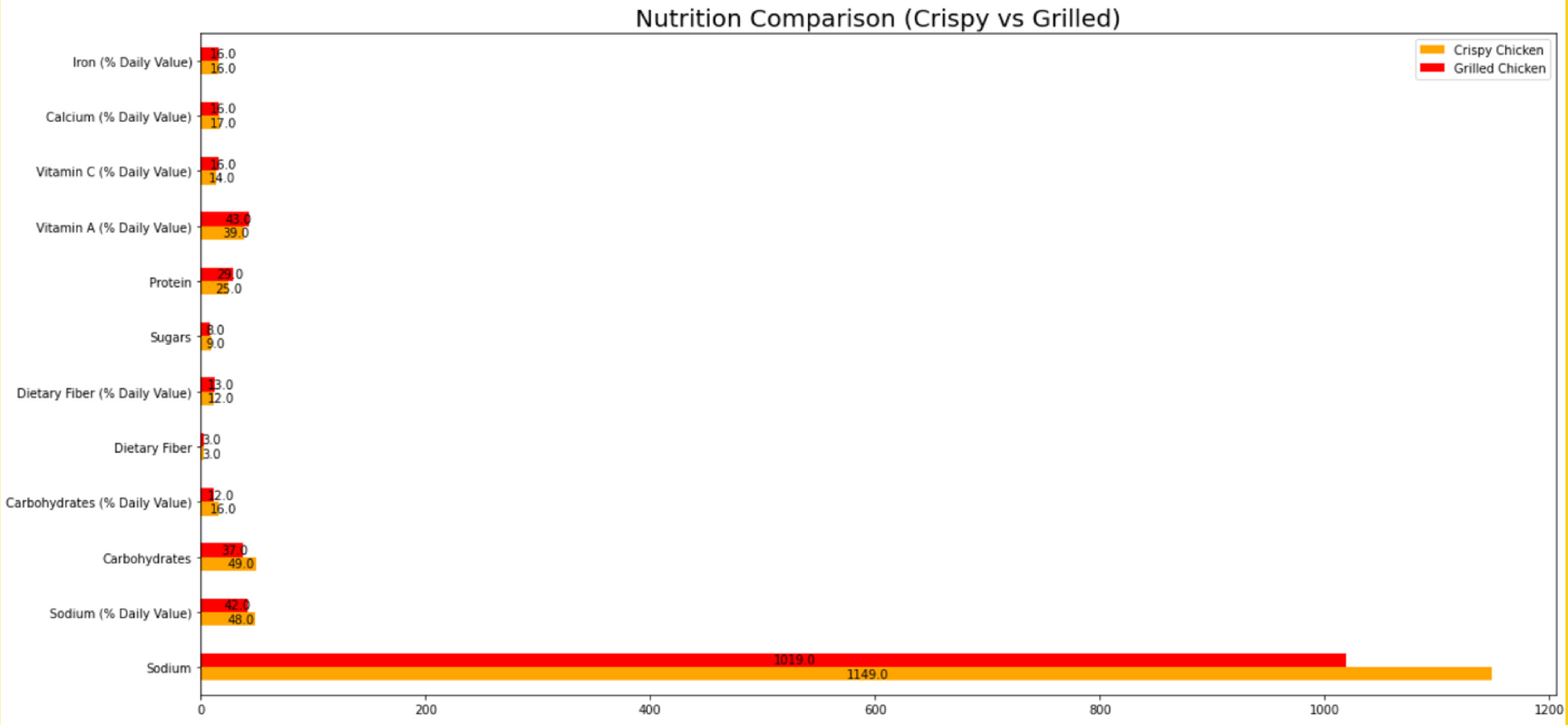


```
Sodium                           1148.571429
Sodium (% Daily Value)             47.857143
Carbohydrates                      49.000000
Carbohydrates (% Daily Value)      16.285714
Dietary Fiber                       2.928571
Dietary Fiber (% Daily Value)      12.500000
Sugars                              9.071429
Protein                            24.928571
Vitamin A (% Daily Value)          39.000000
Vitamin C (% Daily Value)          13.785714
Calcium (% Daily Value)            16.642857
Iron (% Daily Value)               15.928571
dtype: float64
```

crispychicken.round()

Visualization

with Horizontal Bar Plot



From here, we know that ordering grilled chicken instead of crispy chicken increase the nutrition of the menu. 5/9 nutrition category in grilled chicken had higher nutriton than crispy chicken.

- Dietary Fiber - Proteins - Vitamin A - Vitamin C - Iron

QUESTION 4:
What about ordering egg whites instead of whole eggs?

```
df_wholeegg = df[df['Item'].str.contains('Egg', regex=False)]
```

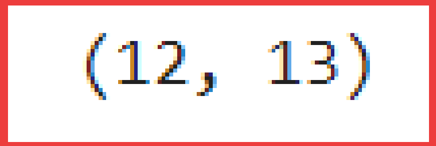
Choose from the 'Item' column where the string contain 'egg' in it, because we want to see the menu with eggs.

```
df_wholeegg_nut = df_wholeegg.drop(['Category', 'Serving Size', 'Calories', 'Calories from Fat',
'Total Fat', 'Total Fat (% Daily Value)', 'Saturated Fat', 'Saturated Fat (% Daily Value)', 'Trans Fat',
'Cholesterol', 'Cholesterol (% Daily Value)','% Overall Daily Calories Intake'], axis=1)
```

Drop column that is not a part of nutrition value.

```
df_eggwhites_nut = df_wholeegg_nut[df_wholeegg_nut['Item'].str.contains('Whites', regex=False)]
df_eggwhites_nut.shape
```

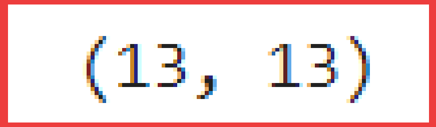
Choose from the 'Item' column wher the string contain 'whites' in it for menu with white eggs.



```
(12, 13)
```

```
df_egg_nut = df_wholeegg_nut[~df_wholeegg_nut['Item'].str.contains('Whites', regex=False)]
df_egg_nut.shape
```

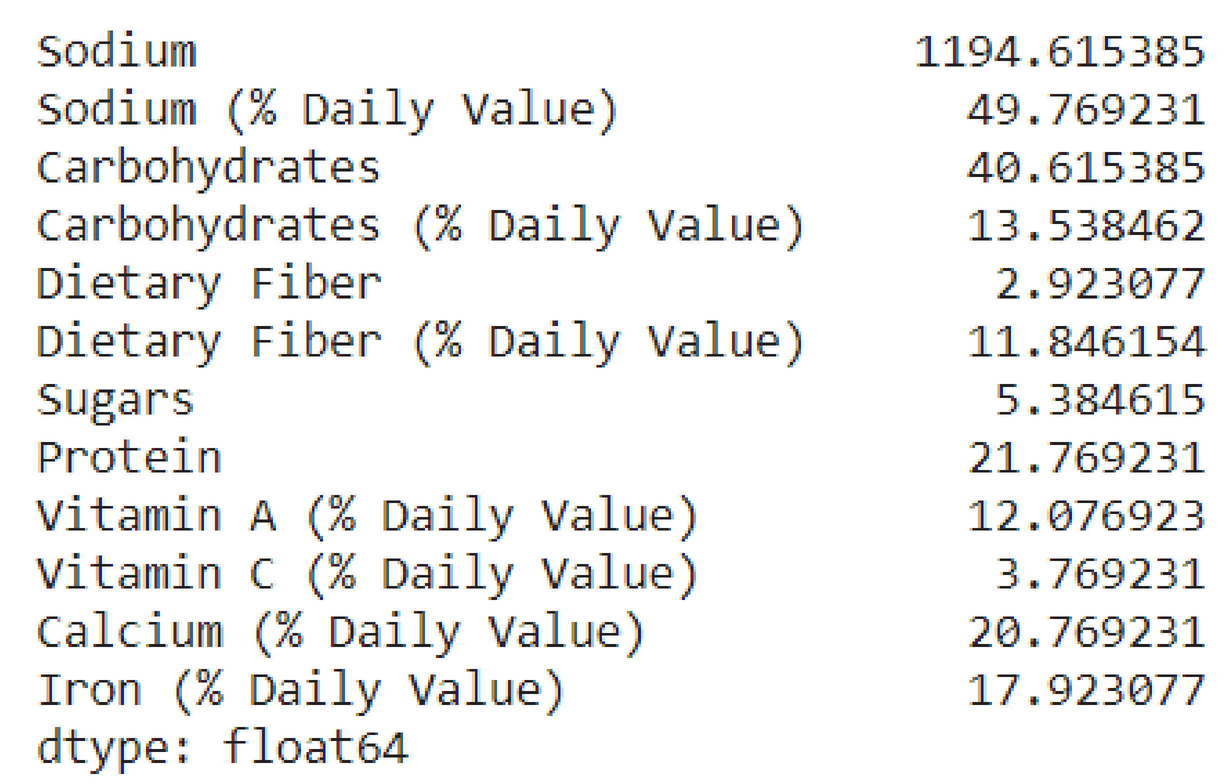
Choose from the 'Item' column where the string does not contain 'whites' in it for menu with whole eggs.



```
(13, 13)
```

df_egg_nut.mean()

the average nutrition in menu with whole eggs.

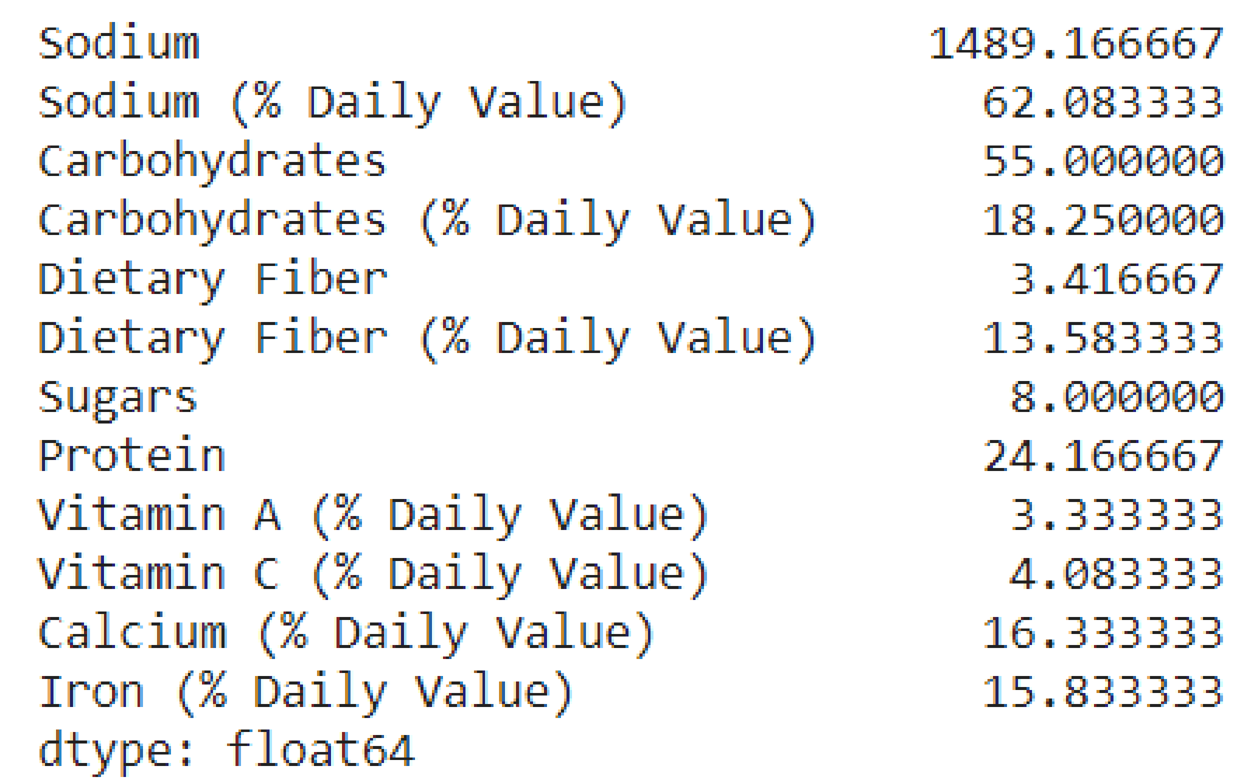


```
Sodium                          1194.615385
Sodium (% Daily Value)            49.769231
Carbohydrates                     40.615385
Carbohydrates (% Daily Value)     13.538462
Dietary Fiber                      2.923077
Dietary Fiber (% Daily Value)     11.846154
Sugars                             5.384615
Protein                           21.769231
Vitamin A (% Daily Value)         12.076923
Vitamin C (% Daily Value)          3.769231
Calcium (% Daily Value)           20.769231
Iron (% Daily Value)              17.923077
dtype: float64
```

wholeeggs.round()

df_eggwhites_nut.mean()

the average nutrition in menu with white eggs.

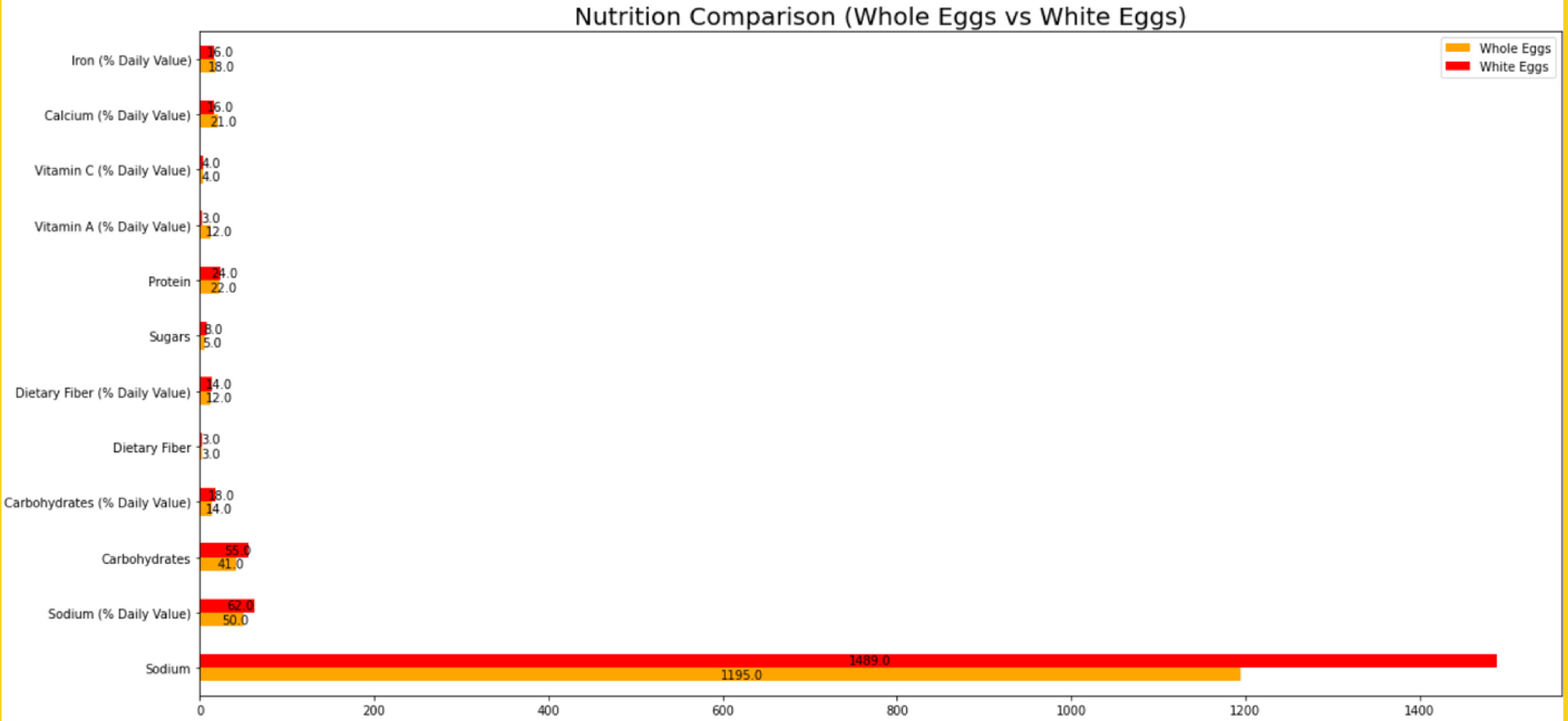


```
Sodium                          1489.166667
Sodium (% Daily Value)            62.083333
Carbohydrates                     55.000000
Carbohydrates (% Daily Value)     18.250000
Dietary Fiber                      3.416667
Dietary Fiber (% Daily Value)     13.583333
Sugars                             8.000000
Protein                           24.166667
Vitamin A (% Daily Value)          3.333333
Vitamin C (% Daily Value)          4.083333
Calcium (% Daily Value)           16.333333
Iron (% Daily Value)              15.833333
dtype: float64
```

whiteeggs.round()

Visualization

with Horizontal Bar Plot



from here, we know that ordering egg whites instead of whole eggs increase the nutrition of the menu. Apart from vitamin A, calcium, and iron, the nutritional value of white eggs is relatively higher than whole eggs.

QUESTION 5:

What is the least number of items could you order from the menu to meet one day's nutritional requirements?

ASSUMPTION

NUTRITIONAL REQUIREMENTS THAT SHOULD BE CONSIDERED -> ALL NUTRITIONS WHICH HAVE ‘% DAILY VALUE’ IN THE DATAFRAME

```
dailyValue_cols = [col for col in df.columns if 'Daily' in col]
dailyValue_cols.insert(0,'Item')
percent = df[dailyValue_cols]
```

select only ‘Items’ and ‘x % Daily Value’ columns

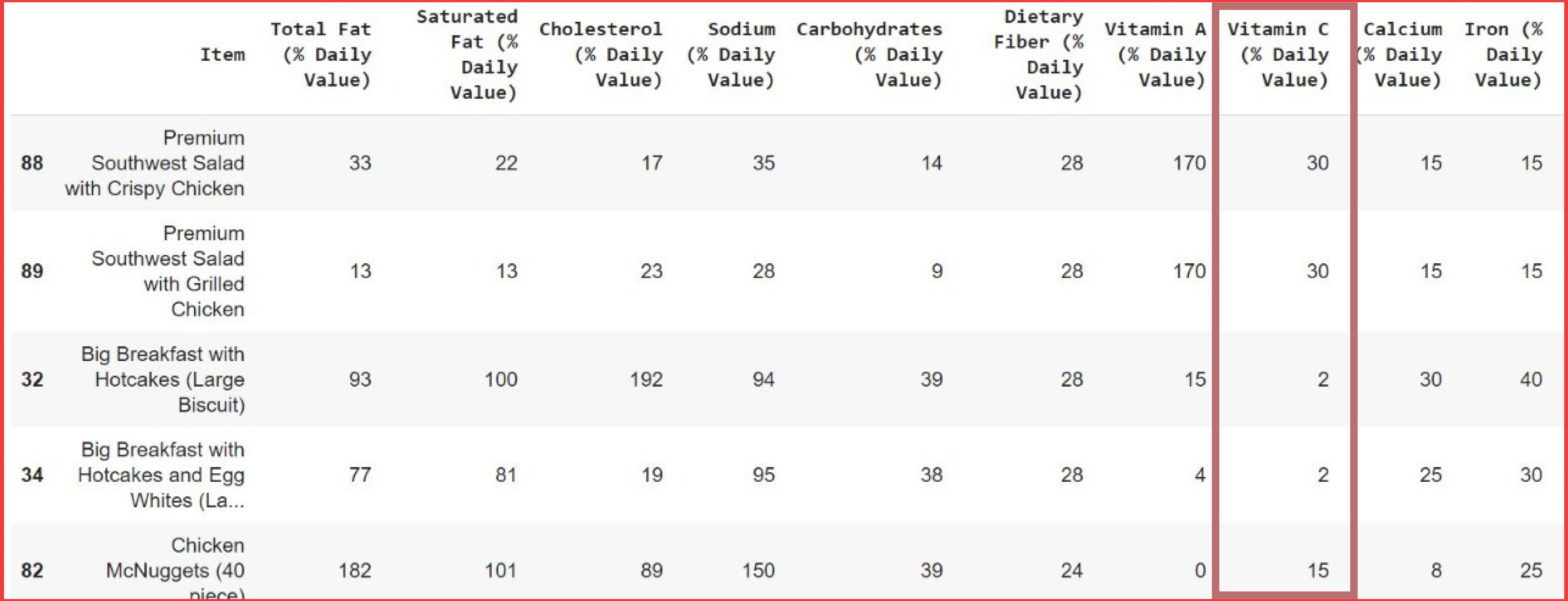
```
percent.describe()
```

Exploratory Data Analysis

From EDA we get that nutrition that play an important role is Dietary Fiber, because it has the lowest mean and max value, and then followed by Carbohydrate and Iron. Hence, Dietary Fiber should be prioritized first in the optimization to get minimum items which could fulfill one day’s nutritional req.

```
sortyby_diet = percent.sort_values(['Dietary Fiber (% Daily Value)', 'Vitamin C (% Daily Value)',
'Carbohydrates (% Daily Value)'], ascending=False)
minimum = sortyby_diet[:5]
```

multiple sorting with 5 rows as initial value. only Vitamin C hasn't reached 100% (fulfill) daily intake yet.



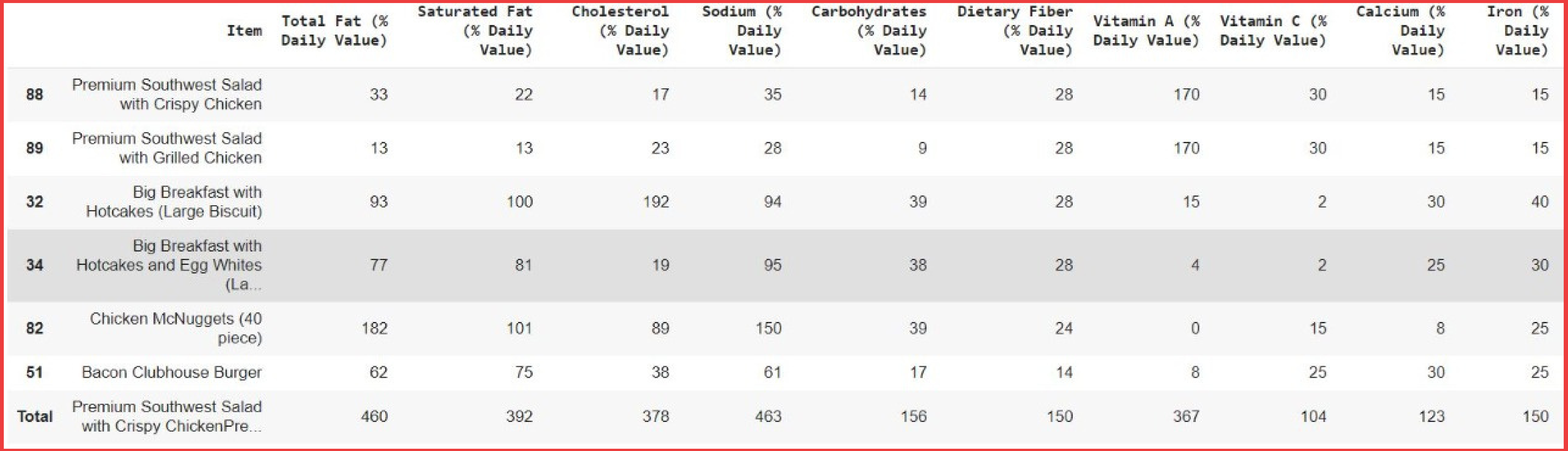
	Item	Total Fat (% Daily Value)	Saturated Fat (% Daily Value)	Cholesterol (% Daily Value)	Sodium (% Daily Value)	Carbohydrates (% Daily Value)	Dietary Fiber (% Daily Value)	Vitamin A (% Daily Value)	Vitamin C (% Daily Value)	Calcium (% Daily Value)	Iron (% Daily Value)
88	Premium Southwest Salad with Crispy Chicken	33	22	17	35	14	28	170	30	15	15
89	Premium Southwest Salad with Grilled Chicken	13	13	23	28	9	28	170	30	15	15
32	Big Breakfast with Hotcakes (Large Biscuit)	93	100	192	94	39	28	15	2	30	40
34	Big Breakfast with Hotcakes and Egg Whites (La...	77	81	19	95	38	28	4	2	25	30
82	Chicken McNuggets (40 piece)	182	101	89	150	39	24	0	15	8	25

```
cari = percent.loc[(percent['Vitamin C (% Daily Value)'] >= 25) &
(percent['Vitamin C (% Daily Value)'] <= 35)]
min_row = cari[:1]
```

sort Item which contain highest to lowest value of Vitamin C.

```
final = minimum.append(min_row, ignore_index=False)
final.loc['Total']= final.sum()
final
```

to show final table



	Item	Total Fat (% Daily Value)	Saturated Fat (% Daily Value)	Cholesterol (% Daily Value)	Sodium (% Daily Value)	Carbohydrates (% Daily Value)	Dietary Fiber (% Daily Value)	Vitamin A (% Daily Value)	Vitamin C (% Daily Value)	Calcium (% Daily Value)	Iron (% Daily Value)
88	Premium Southwest Salad with Crispy Chicken	33	22	17	35	14	28	170	30	15	15
89	Premium Southwest Salad with Grilled Chicken	13	13	23	28	9	28	170	30	15	15
32	Big Breakfast with Hotcakes (Large Biscuit)	93	100	192	94	39	28	15	2	30	40
34	Big Breakfast with Hotcakes and Egg Whites (La...	77	81	19	95	38	28	4	2	25	30
82	Chicken McNuggets (40 piece)	182	101	89	150	39	24	0	15	8	25
51	Bacon Clubhouse Burger	62	75	38	61	17	14	8	25	30	25
Total	Premium Southwest Salad with Crispy ChickenPre...	460	392	378	463	156	150	367	104	123	150

Yeppie! We have answered the whole questions! What about you?

THANKYOU