McDonald project

September 4, 2024

[9]:
```
import pandas as pd
import os
os.getcwd()
```

[9]:
```
'C:\\Users\\Avantikka'
```

[11]:
```
# Reading file in csv using pandas
df= pd.read_csv(r"C:\Users\Avantikka\Jupyter\Python\Nutrical Dataset.csv")
```

[7]:
```
type(df)
```

[7]:
```
pandas.core.frame.DataFrame
```

[9]:
```
df
```

[9]:

	Category	Item	Serving Size	Calories	Calories from Fat	Total Fat	\
0	Breakfast	Egg McMuffin	4.8 oz (136 g)	300	120	13.0	
1	Breakfast	Egg White Delight	4.8 oz (135 g)	250	70	8.0	
2	Breakfast	Sausage McMuffin	3.9 oz (111 g)	370	200	23.0	
3	Breakfast	Sausage McMuffin with Egg	5.7 oz (161 g)	450	250	28.0	
4	Breakfast	Sausage McMuffin with Egg Whites	5.7 oz (161 g)	400	210	23.0	
..	…	…	…	…	…	…	
255	Smoothies & Shakes	McFlurry with Oreo Cookies (Small)	10.1 oz (285 g)	510	150	17.0	
256	Smoothies & Shakes	McFlurry with Oreo Cookies (Medium)	13.4 oz (381 g)	690	200	23.0	
257	Smoothies & Shakes	McFlurry with Oreo Cookies (Snack)	6.7 oz (190 g)	340	100	11.0	
258	Smoothies & Shakes	McFlurry with Reese's Peanut Butter Cups (Medium)					
259	Smoothies & Shakes	McFlurry with Reese's Peanut Butter Cups (Snack)					

```
258  14.2 oz (403 g)       810                290       32.0
259   7.1 oz (202 g)       410                150       16.0

     Total Fat (% Daily Value)  Saturated Fat  Saturated Fat (% Daily Value)  \
0                            20            5.0                             25
1                            12            3.0                             15
2                            35            8.0                             42
3                            43           10.0                             52
4                            35            8.0                             42
..                          ...            ...                            ...
255                          26            9.0                             44
256                          35           12.0                             58
257                          17            6.0                             29
258                          50           15.0                             76
259                          25            8.0                             38

     Trans Fat  …  Carbohydrates  Carbohydrates (% Daily Value)  \
0          0.0  …              31                             10
1          0.0  …              30                             10
2          0.0  …              29                             10
3          0.0  …              30                             10
4          0.0  …              30                             10
..         ...  ...           ...                            ...
255        0.5  …              80                             27
256        1.0  …             106                             35
257        0.0  …              53                             18
258        1.0  …             114                             38
259        0.0  …              57                             19

     Dietary Fiber  Dietary Fiber (% Daily Value)  Sugars  Protein  \
0                4                             17       3       17
1                4                             17       3       18
2                4                             17       2       14
3                4                             17       2       21
4                4                             17       2       21
..             ...                            ...     ...      ...
255              1                              4      64       12
256              1                              5      85       15
257              1                              2      43        8
258              2                              9     103       21
259              1                              5      51       10

     Vitamin A (% Daily Value)  Vitamin C (% Daily Value)  \
0                            10                          0
1                             6                          0
2                             8                          0
3                            15                          0
```

```
4                              6                          0
..                           …                        …
255                           15                         0
256                           20                         0
257                           10                         0
258                           20                         0
259                           10                         0

     Calcium (% Daily Value)  Iron (% Daily Value)
0                         25                    15
1                         25                     8
2                         25                    10
3                         30                    15
4                         25                    10
..                       …                     …
255                       40                     8
256                       50                    10
257                       25                     6
258                       60                     6
259                       30                     4

[260 rows x 24 columns]
```

[17]:
```
# Checking for missing values in the dataframe
df.isnull()
```

[17]:
```
     Category   Item  Serving Size  Calories  Calories from Fat  Total Fat  \
0       False  False         False     False              False      False
1       False  False         False     False              False      False
2       False  False         False     False              False      False
3       False  False         False     False              False      False
4       False  False         False     False              False      False
..        …    …             …         …                  …          …
255     False  False         False     False              False      False
256     False  False         False     False              False      False
257     False  False         False     False              False      False
258     False  False         False     False              False      False
259     False  False         False     False              False      False

     Total Fat (% Daily Value)  Saturated Fat  Saturated Fat (% Daily Value)  \
0                        False          False                          False
1                        False          False                          False
2                        False          False                          False
3                        False          False                          False
4                        False          False                          False
..                         …              …                              …
255                      False          False                          False
```

```
256                    False          False                           False
257                    False          False                           False
258                    False          False                           False
259                    False          False                           False

     Trans Fat  …  Carbohydrates  Carbohydrates (% Daily Value)  \
0        False  …           False                          False
1        False  …           False                          False
2        False  …           False                          False
3        False  …           False                          False
4        False  …           False                          False
..         …  …              …                              …
255      False  …           False                          False
256      False  …           False                          False
257      False  …           False                          False
258      False  …           False                          False
259      False  …           False                          False

     Dietary Fiber  Dietary Fiber (% Daily Value)  Sugars  Protein  \
0            False                          False   False    False
1            False                          False   False    False
2            False                          False   False    False
3            False                          False   False    False
4            False                          False   False    False
..             …                              …       …        …
255          False                          False   False    False
256          False                          False   False    False
257          False                          False   False    False
258          False                          False   False    False
259          False                          False   False    False

     Vitamin A (% Daily Value)  Vitamin C (% Daily Value)  \
0                        False                      False
1                        False                      False
2                        False                      False
3                        False                      False
4                        False                      False
..                         …                          …
255                      False                      False
256                      False                      False
257                      False                      False
258                      False                      False
259                      False                      False

     Calcium (% Daily Value)  Iron (% Daily Value)
0                      False                 False
1                      False                 False
```

```
2                    False                False
3                    False                False
4                    False                False
..                     …                  …
255                  False                False
256                  False                False
257                  False                False
258                  False                False
259                  False                False

[260 rows x 24 columns]
```

[25]:
```
#Checking data types of each columns
df.dtypes
```

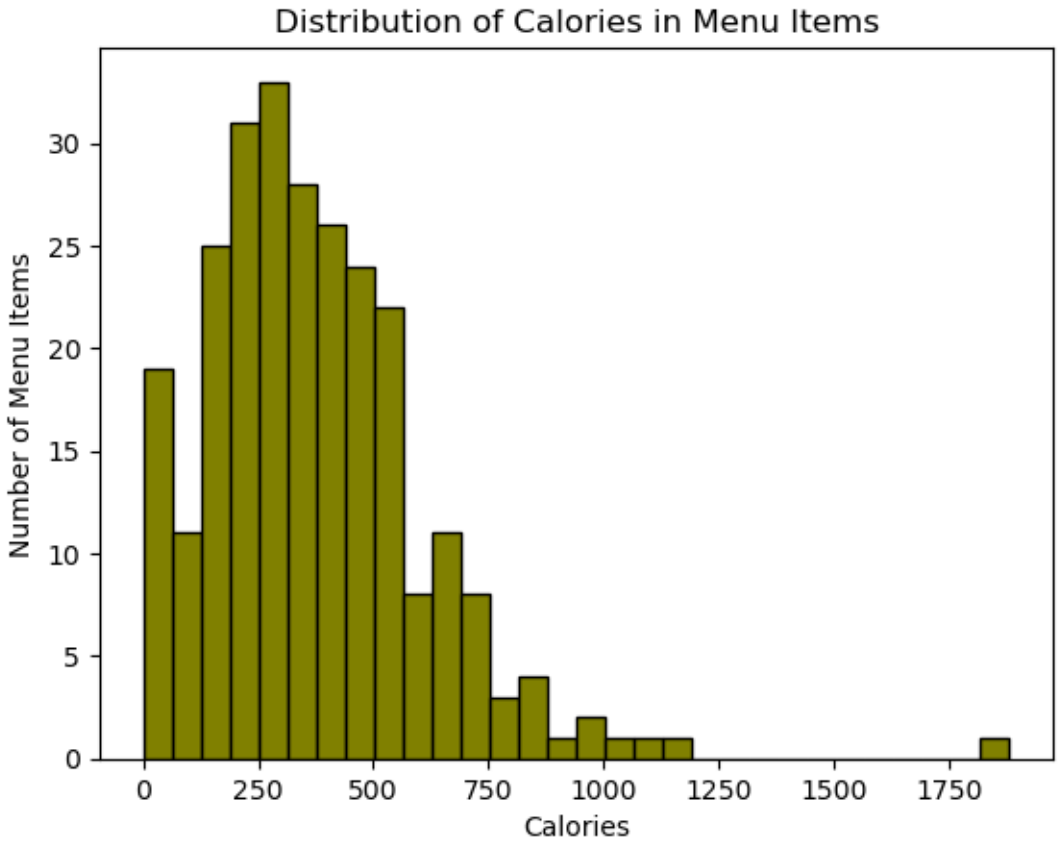
[25]:
```
Category                          object
Item                              object
Serving Size                      object
Calories                           int64
Calories from Fat                  int64
Total Fat                        float64
Total Fat (% Daily Value)          int64
Saturated Fat                    float64
Saturated Fat (% Daily Value)      int64
Trans Fat                        float64
Cholesterol                        int64
Cholesterol (% Daily Value)        int64
Sodium                             int64
Sodium (% Daily Value)             int64
Carbohydrates                      int64
Carbohydrates (% Daily Value)      int64
Dietary Fiber                      int64
Dietary Fiber (% Daily Value)      int64
Sugars                             int64
Protein                            int64
Vitamin A (% Daily Value)          int64
Vitamin C (% Daily Value)          int64
Calcium (% Daily Value)            int64
Iron (% Daily Value)               int64
dtype: object
```

[52]:
```
calories_stats = df['Calories'].describe()
print(calories_stats)
```

```
count     260.000000
mean      368.269231
std       240.269886
min         0.000000
```

```
25%       210.000000
50%       340.000000
75%       500.000000
max      1880.000000
Name: Calories, dtype: float64
```

[13]:
```
# Analyze the distribution of calorie counts across menu items.
import matplotlib.pyplot as plt
plt.hist(df['Calories'], bins=30, color='olive', edgecolor='black')
plt.title('Distribution of Calories in Menu Items')
plt.xlabel('Calories')
plt.ylabel('Number of Menu Items')
plt.show()
```



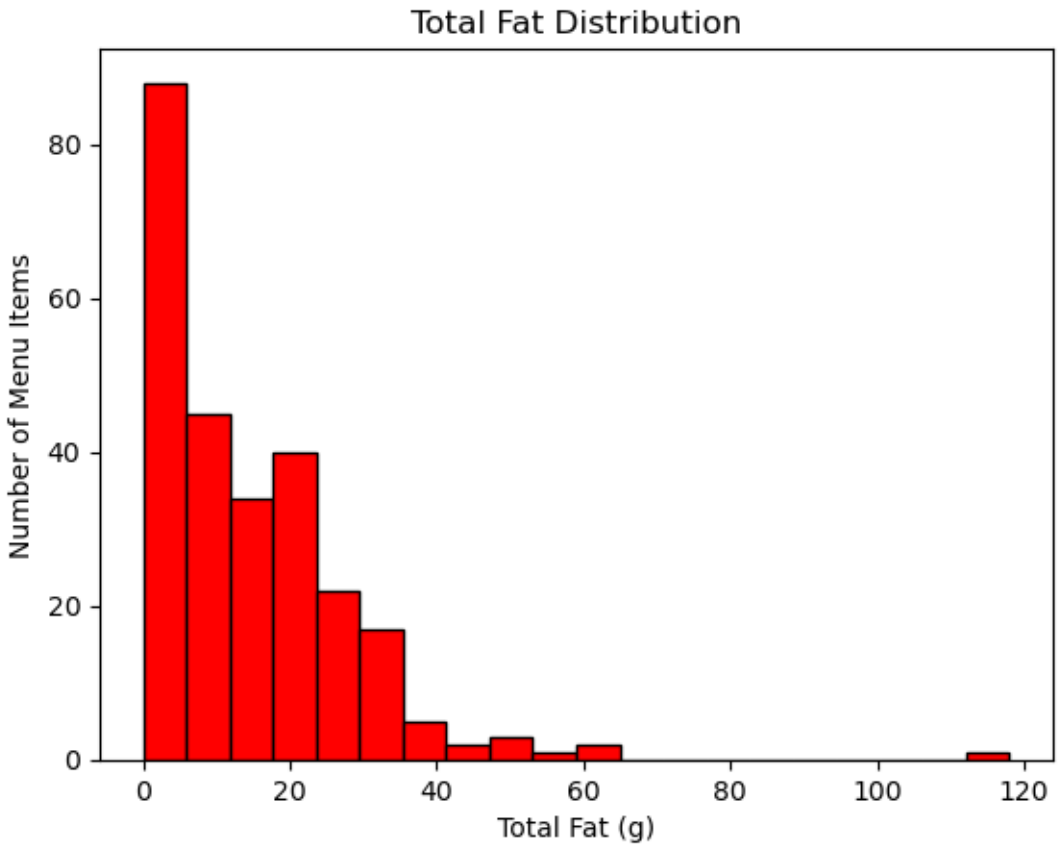
[70]:
```
#Explore the nutritional content (e.g., fat, protein, carbohydrates) of␣
 ↪different items.
# Descriptive statistics for Total Fat, Protein, and Carbohydrates
total_fat = df['Total Fat'].describe()
total_protein = df['Protein'].describe()
total_carbohydrates = df['Carbohydrates'].describe()
```

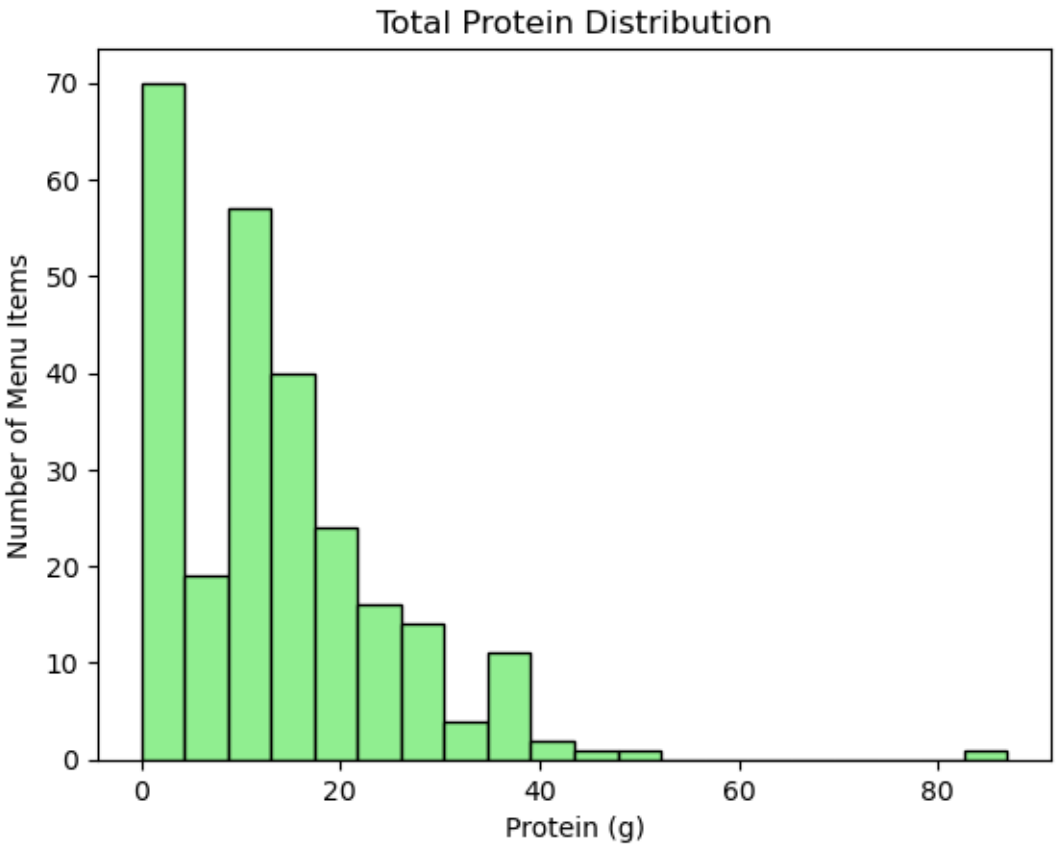
```
print(total_fat)
print(total_protein)
print(total_carbohydrates)
```

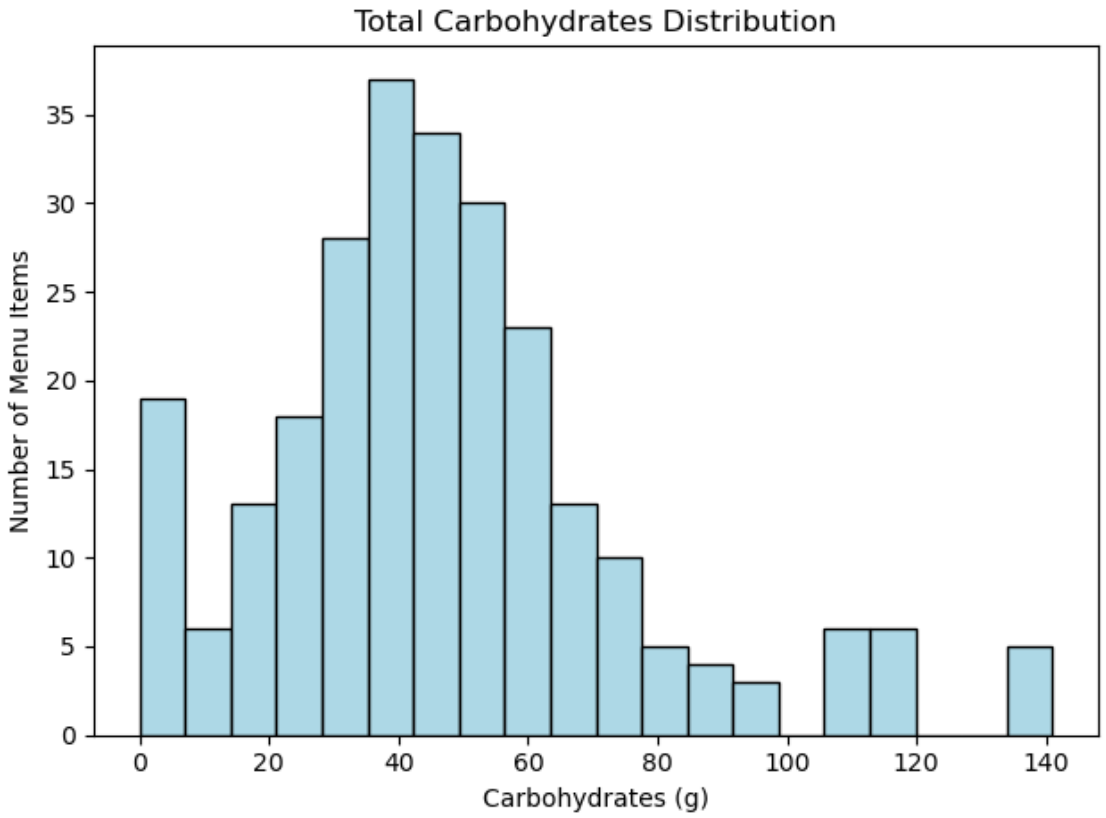
```
count    260.000000
mean      14.165385
std       14.205998
min        0.000000
25%        2.375000
50%       11.000000
75%       22.250000
max      118.000000
Name: Total Fat, dtype: float64
count    260.000000
mean      13.338462
std       11.426146
min        0.000000
25%        4.000000
50%       12.000000
75%       19.000000
max       87.000000
Name: Protein, dtype: float64
count    260.000000
mean      47.346154
std       28.252232
min        0.000000
25%       30.000000
50%       44.000000
75%       60.000000
max      141.000000
Name: Carbohydrates, dtype: float64
```

[90]:
```
# Plot histograms for Total Fat, Protein, and Carbohydrates

# Total Fat distribution
plt.hist(df['Total Fat'], bins=20, color='red', edgecolor='black')
plt.title('Total Fat Distribution')
plt.xlabel('Total Fat (g)')
plt.ylabel('Number of Menu Items')
plt.show()

# Protein distribution
plt.hist(df['Protein'], bins=20, color='lightgreen', edgecolor='black')
plt.title('Total Protein Distribution')
plt.xlabel('Protein (g)')
plt.ylabel('Number of Menu Items')
```

```
plt.show()


# Carbohydrates distribution
plt.hist(df['Carbohydrates'], bins=20, color='lightblue', edgecolor='black')
plt.title('Total Carbohydrates Distribution')
plt.xlabel('Carbohydrates (g)')
plt.ylabel('Number of Menu Items')

plt.tight_layout()
plt.show()
```




Total Protein Distribution
Number of Menu Items
Protein (g)
0
10
20
30
40
50
60
70
0
20
40
60
80



[100]:
```
# Calculate the correlation matrix
numeric_df = df.select_dtypes(include=['float64', 'int64'])
correlation_matrix = numeric_df.corr()
print(correlation_matrix)
```

```
                                Calories  Calories from Fat  Total Fat  \
Calories                        1.000000           0.904588   0.904409
Calories from Fat               0.904588           1.000000   0.999663
Total Fat                       0.904409           0.999663   1.000000
Total Fat (% Daily Value)       0.904123           0.999725   0.999765
Saturated Fat                   0.845564           0.847008   0.846707
Saturated Fat (% Daily Value)   0.847631           0.849592   0.849293
Trans Fat                       0.522441           0.433686   0.431453
Cholesterol                     0.596399           0.682161   0.680547
Cholesterol (% Daily Value)     0.595208           0.681607   0.680000
Sodium                          0.712309           0.846624   0.846158
Sodium (% Daily Value)          0.713415           0.847276   0.846780
Carbohydrates                   0.781539           0.461672   0.461213
Carbohydrates (% Daily Value)   0.781242           0.461463   0.461005
Dietary Fiber                   0.538894           0.581274   0.580837
Dietary Fiber (% Daily Value)   0.540014           0.575621   0.575206
```

Sugars	0.259598	-0.115285	-0.115446
Protein	0.787847	0.807913	0.807773
Vitamin A (% Daily Value)	0.108844	0.056731	0.054434
Vitamin C (% Daily Value)	-0.068747	-0.087331	-0.089354
Calcium (% Daily Value)	0.428426	0.161034	0.162860
Iron (% Daily Value)	0.643552	0.735894	0.734685

	Total Fat (% Daily Value)	Saturated Fat	\
Calories	0.904123	0.845564	
Calories from Fat	0.999725	0.847008	
Total Fat	0.999765	0.846707	
Total Fat (% Daily Value)	1.000000	0.847379	
Saturated Fat	0.847379	1.000000	
Saturated Fat (% Daily Value)	0.849973	0.999279	
Trans Fat	0.433016	0.620611	
Cholesterol	0.680940	0.631210	
Cholesterol (% Daily Value)	0.680378	0.630334	
Sodium	0.846728	0.584075	
Sodium (% Daily Value)	0.847368	0.585323	
Carbohydrates	0.460516	0.591261	
Carbohydrates (% Daily Value)	0.460298	0.591743	
Dietary Fiber	0.580592	0.351818	
Dietary Fiber (% Daily Value)	0.575033	0.347152	
Sugars	-0.115761	0.197734	
Protein	0.807922	0.603028	
Vitamin A (% Daily Value)	0.054038	0.064972	
Vitamin C (% Daily Value)	-0.089353	-0.179672	
Calcium (% Daily Value)	0.162031	0.403311	
Iron (% Daily Value)	0.735478	0.578062	

	Saturated Fat (% Daily Value)	Trans Fat	\
Calories	0.847631	0.522441	
Calories from Fat	0.849592	0.433686	
Total Fat	0.849293	0.431453	
Total Fat (% Daily Value)	0.849973	0.433016	
Saturated Fat	0.999279	0.620611	
Saturated Fat (% Daily Value)	1.000000	0.620210	
Trans Fat	0.620210	1.000000	
Cholesterol	0.633603	0.253935	
Cholesterol (% Daily Value)	0.632712	0.251502	
Sodium	0.588694	0.187580	
Sodium (% Daily Value)	0.589958	0.188339	
Carbohydrates	0.591322	0.463250	
Carbohydrates (% Daily Value)	0.591655	0.462891	
Dietary Fiber	0.356831	0.054918	
Dietary Fiber (% Daily Value)	0.351797	0.058301	
Sugars	0.195928	0.334756	
Protein	0.606581	0.388249	

Vitamin A (% Daily Value)	0.065376	0.075833
Vitamin C (% Daily Value)	-0.178059	-0.076612
Calcium (% Daily Value)	0.401139	0.385331
Iron (% Daily Value)	0.580488	0.325476

	Cholesterol	Cholesterol (% Daily Value)	\
Calories	0.596399	0.595208	
Calories from Fat	0.682161	0.681607	
Total Fat	0.680547	0.680000	
Total Fat (% Daily Value)	0.680940	0.680378	
Saturated Fat	0.631210	0.630334	
Saturated Fat (% Daily Value)	0.633603	0.632712	
Trans Fat	0.253935	0.251502	
Cholesterol	1.000000	0.999855	
Cholesterol (% Daily Value)	0.999855	1.000000	
Sodium	0.624362	0.623320	
Sodium (% Daily Value)	0.624743	0.623720	
Carbohydrates	0.270977	0.269300	
Carbohydrates (% Daily Value)	0.272662	0.270992	
Dietary Fiber	0.435575	0.434940	
Dietary Fiber (% Daily Value)	0.440266	0.439814	
Sugars	-0.135518	-0.136459	
Protein	0.561561	0.560957	
Vitamin A (% Daily Value)	0.080239	0.080059	
Vitamin C (% Daily Value)	-0.082978	-0.083315	
Calcium (% Daily Value)	0.132077	0.132382	
Iron (% Daily Value)	0.655000	0.653167	

	Sodium	…	Carbohydrates	\
Calories	0.712309	…	0.781539	
Calories from Fat	0.846624	…	0.461672	
Total Fat	0.846158	…	0.461213	
Total Fat (% Daily Value)	0.846728	…	0.460516	
Saturated Fat	0.584075	…	0.591261	
Saturated Fat (% Daily Value)	0.588694	…	0.591322	
Trans Fat	0.187580	…	0.463250	
Cholesterol	0.624362	…	0.270977	
Cholesterol (% Daily Value)	0.623320	…	0.269300	
Sodium	1.000000	…	0.200796	
Sodium (% Daily Value)	0.999929	…	0.202426	
Carbohydrates	0.200796	…	1.000000	
Carbohydrates (% Daily Value)	0.201032	…	0.999620	
Dietary Fiber	0.694389	…	0.224577	
Dietary Fiber (% Daily Value)	0.689995	…	0.228257	
Sugars	-0.426536	…	0.762362	
Protein	0.869802	…	0.352122	
Vitamin A (% Daily Value)	0.083068	…	0.083802	
Vitamin C (% Daily Value)	-0.030769	…	-0.034724	

```
Calcium (% Daily Value)       -0.024074  …       0.589699
Iron (% Daily Value)           0.871593  …       0.210241
```

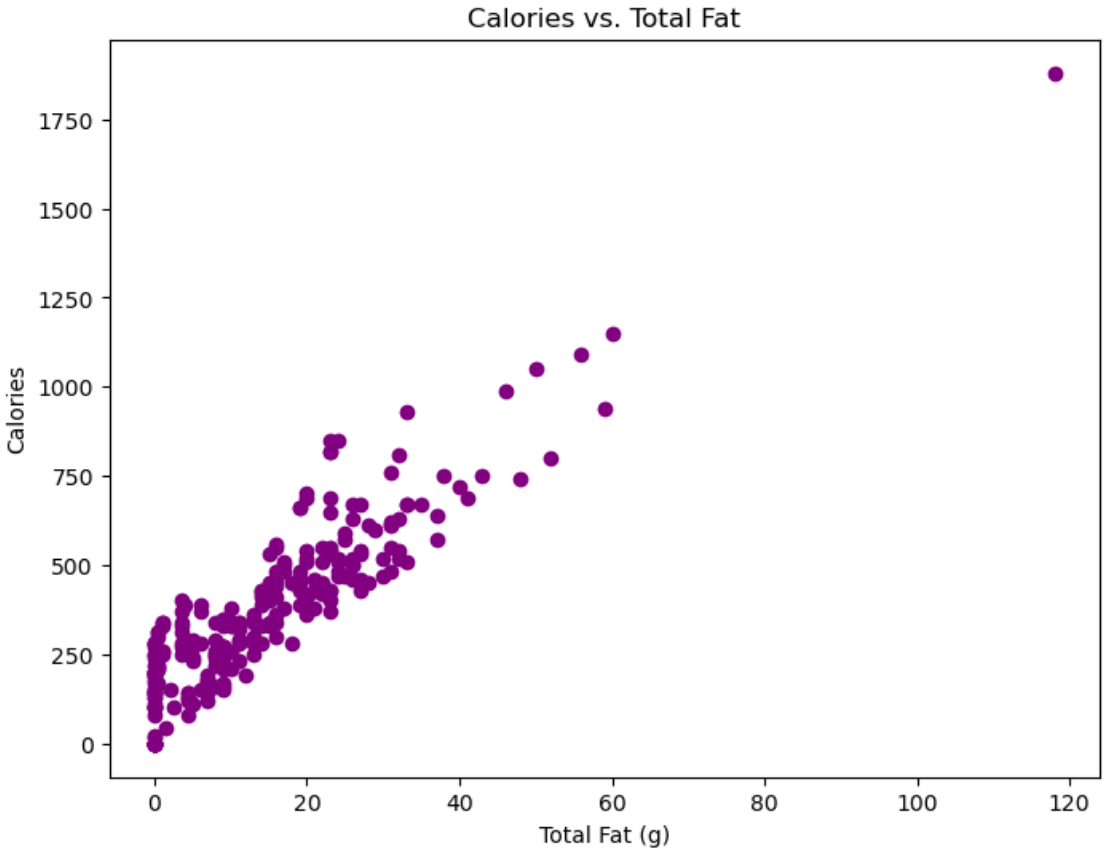
	Carbohydrates (% Daily Value)	Dietary Fiber
Calories	0.781242	0.538894
Calories from Fat	0.461463	0.581274
Total Fat	0.461005	0.580837
Total Fat (% Daily Value)	0.460298	0.580592
Saturated Fat	0.591743	0.351818
Saturated Fat (% Daily Value)	0.591655	0.356831
Trans Fat	0.462891	0.054918
Cholesterol	0.272662	0.435575
Cholesterol (% Daily Value)	0.270992	0.434940
Sodium	0.201032	0.694389
Sodium (% Daily Value)	0.202663	0.693913
Carbohydrates	0.999620	0.224577
Carbohydrates (% Daily Value)	1.000000	0.224058
Dietary Fiber	0.224058	1.000000
Dietary Fiber (% Daily Value)	0.227285	0.986350
Sugars	0.762282	-0.295178
Protein	0.352178	0.641345
Vitamin A (% Daily Value)	0.083376	0.340518
Vitamin C (% Daily Value)	-0.035450	0.141935
Calcium (% Daily Value)	0.590263	0.028711
Iron (% Daily Value)	0.210643	0.740411

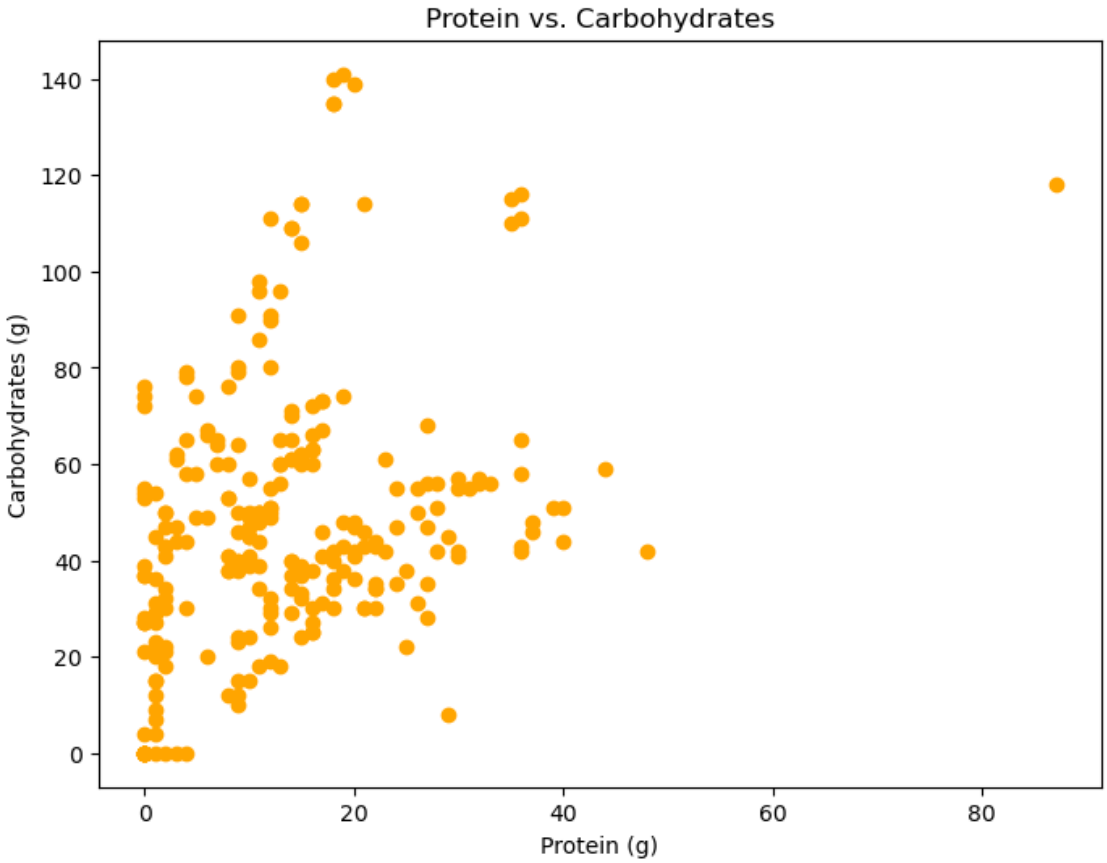
	Dietary Fiber (% Daily Value)	Sugars
Calories	0.540014	0.259598
Calories from Fat	0.575621	-0.115285
Total Fat	0.575206	-0.115446
Total Fat (% Daily Value)	0.575033	-0.115761
Saturated Fat	0.347152	0.197734
Saturated Fat (% Daily Value)	0.351797	0.195928
Trans Fat	0.058301	0.334756
Cholesterol	0.440266	-0.135518
Cholesterol (% Daily Value)	0.439814	-0.136459
Sodium	0.689995	-0.426536
Sodium (% Daily Value)	0.689464	-0.424943
Carbohydrates	0.228257	0.762362
Carbohydrates (% Daily Value)	0.227285	0.762282
Dietary Fiber	0.986350	-0.295178
Dietary Fiber (% Daily Value)	1.000000	-0.287014
Sugars	-0.287014	1.000000
Protein	0.656648	-0.179940
Vitamin A (% Daily Value)	0.361380	0.048488
Vitamin C (% Daily Value)	0.150019	-0.069847
Calcium (% Daily Value)	0.052359	0.600093
Iron (% Daily Value)	0.737814	-0.364767

```
                                Protein  Vitamin A (% Daily Value)  \
Calories                       0.787847                   0.108844
Calories from Fat              0.807913                   0.056731
Total Fat                      0.807773                   0.054434
Total Fat (% Daily Value)      0.807922                   0.054038
Saturated Fat                  0.603028                   0.064972
Saturated Fat (% Daily Value)  0.606581                   0.065376
Trans Fat                      0.388249                   0.075833
Cholesterol                    0.561561                   0.080239
Cholesterol (% Daily Value)    0.560957                   0.080059
Sodium                         0.869802                   0.083068
Sodium (% Daily Value)         0.869870                   0.083259
Carbohydrates                  0.352122                   0.083802
Carbohydrates (% Daily Value)  0.352178                   0.083376
Dietary Fiber                  0.641345                   0.340518
Dietary Fiber (% Daily Value)  0.656648                   0.361380
Sugars                        -0.179940                   0.048488
Protein                        1.000000                   0.214098
Vitamin A (% Daily Value)      0.214098                   1.000000
Vitamin C (% Daily Value)     -0.045777                   0.069171
Calcium (% Daily Value)        0.327971                   0.179190
Iron (% Daily Value)           0.792719                   0.137879

                               Vitamin C (% Daily Value)  \
Calories                                       -0.068747
Calories from Fat                              -0.087331
Total Fat                                      -0.089354
Total Fat (% Daily Value)                      -0.089353
Saturated Fat                                  -0.179672
Saturated Fat (% Daily Value)                  -0.178059
Trans Fat                                      -0.076612
Cholesterol                                    -0.082978
Cholesterol (% Daily Value)                    -0.083315
Sodium                                         -0.030769
Sodium (% Daily Value)                         -0.030945
Carbohydrates                                  -0.034724
Carbohydrates (% Daily Value)                  -0.035450
Dietary Fiber                                   0.141935
Dietary Fiber (% Daily Value)                   0.150019
Sugars                                         -0.069847
Protein                                        -0.045777
Vitamin A (% Daily Value)                       0.069171
Vitamin C (% Daily Value)                       1.000000
Calcium (% Daily Value)                        -0.215380
Iron (% Daily Value)                            0.001292

                               Calcium (% Daily Value)  Iron (% Daily Value)
```

```
Calories                                 0.428426              0.643552
Calories from Fat                        0.161034              0.735894
Total Fat                                0.162860              0.734685
Total Fat (% Daily Value)                0.162031              0.735478
Saturated Fat                            0.403311              0.578062
Saturated Fat (% Daily Value)            0.401139              0.580488
Trans Fat                                0.385331              0.325476
Cholesterol                              0.132077              0.655000
Cholesterol (% Daily Value)              0.132382              0.653167
Sodium                                  -0.024074              0.871593
Sodium (% Daily Value)                  -0.022145              0.870742
Carbohydrates                            0.589699              0.210241
Carbohydrates (% Daily Value)            0.590263              0.210643
Dietary Fiber                            0.028711              0.740411
Dietary Fiber (% Daily Value)            0.052359              0.737814
Sugars                                   0.600093             -0.364767
Protein                                  0.327971              0.792719
Vitamin A (% Daily Value)                0.179190              0.137879
Vitamin C (% Daily Value)               -0.215380              0.001292
Calcium (% Daily Value)                  1.000000              0.034149
Iron (% Daily Value)                     0.034149              1.000000

[21 rows x 21 columns]
```

[15]:
```python
#Identify trends and patterns in the dataset.

# Scatter plot for Calories vs. Total Fat
plt.figure(figsize=(8, 6))
plt.scatter(df['Total Fat'], df['Calories'], color='purple')
plt.title('Calories vs. Total Fat')
plt.xlabel('Total Fat (g)')
plt.ylabel('Calories')
plt.show()

# Scatter plot for Protein vs. Carbohydrates
plt.figure(figsize=(8, 6))
plt.scatter(df['Protein'], df['Carbohydrates'], color='orange')
plt.title('Protein vs. Carbohydrates')
plt.xlabel('Protein (g)')
plt.ylabel('Carbohydrates (g)')
plt.show()
```


Calories vs. Total Fat
Calories
Total Fat (g)
0
250
500
750
1000
1250
1500
1750
0
20
40
60
80
100
120



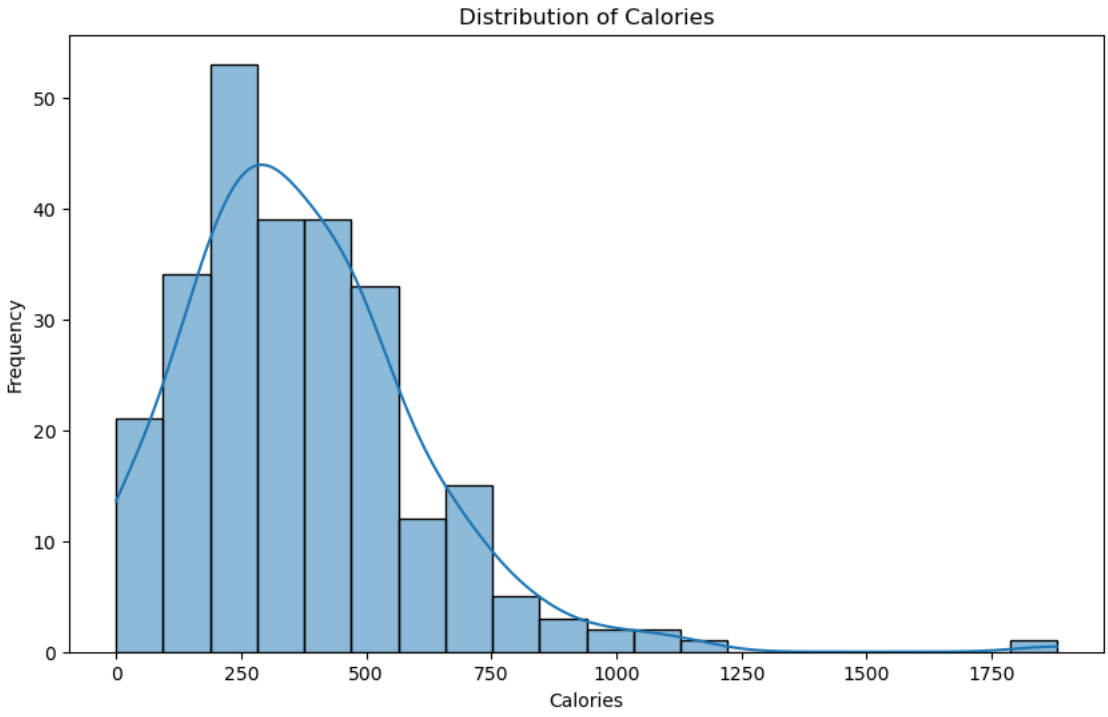
[3]:
```
#Create bar charts, histograms, and box plots to visualize calorie distribution␣
 ↪and nutritional content.
import seaborn as sns
plt.figure(figsize=(10, 6))
avg_calories_per_category = df.groupby('Category')['Calories'].mean().
 ↪sort_values()
sns.barplot(x=avg_calories_per_category, y=avg_calories_per_category.index)
plt.title('Average Calories per Category')
plt.xlabel('Average Calories')
plt.ylabel('Category')
plt.show()
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[3], line 3
      1 #Create bar charts, histograms, and box plots to visualize calorie␣
 ↪distribution and nutritional content.
      2 import seaborn as sns
----> 3 plt.figure(figsize=(10, 6))
```

```
    4 avg_calories_per_category = df.groupby('Category')['Calories'].mean().
↪sort_values()
    5 sns.barplot(x=avg_calories_per_category, y=avg_calories_per_category.
↪index)

NameError: name 'plt' is not defined
```

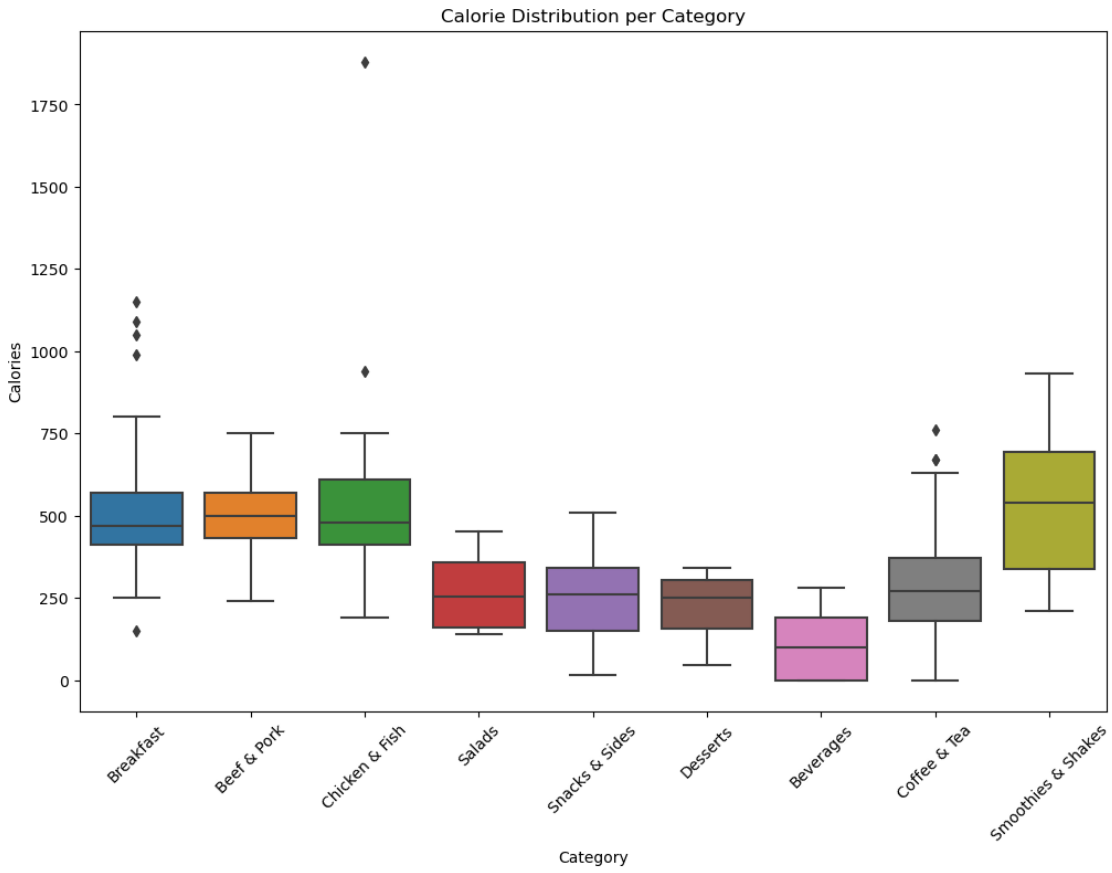
[17]:
```
# Histogram: Distribution of Calories
plt.figure(figsize=(10, 6))
sns.histplot(df['Calories'], bins=20, kde=True)
plt.title('Distribution of Calories')
plt.xlabel('Calories')
plt.ylabel('Frequency')
plt.show()
```

```
C:\Users\Avantikka\anaconda4\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
```



[114]:
```
# Box Plot: Calories per Category
plt.figure(figsize=(12, 8))
sns.boxplot(x='Category', y='Calories', data=df)
```

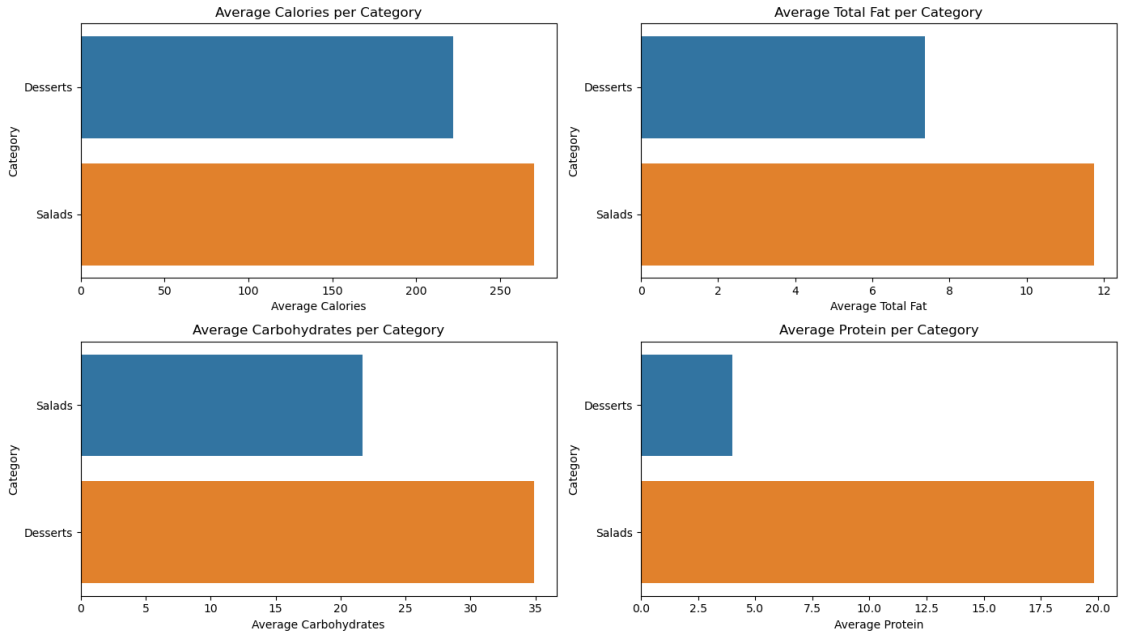
```
plt.xticks(rotation=45)
plt.title('Calorie Distribution per Category')
plt.xlabel('Category')
plt.ylabel('Calories')
plt.show()
```

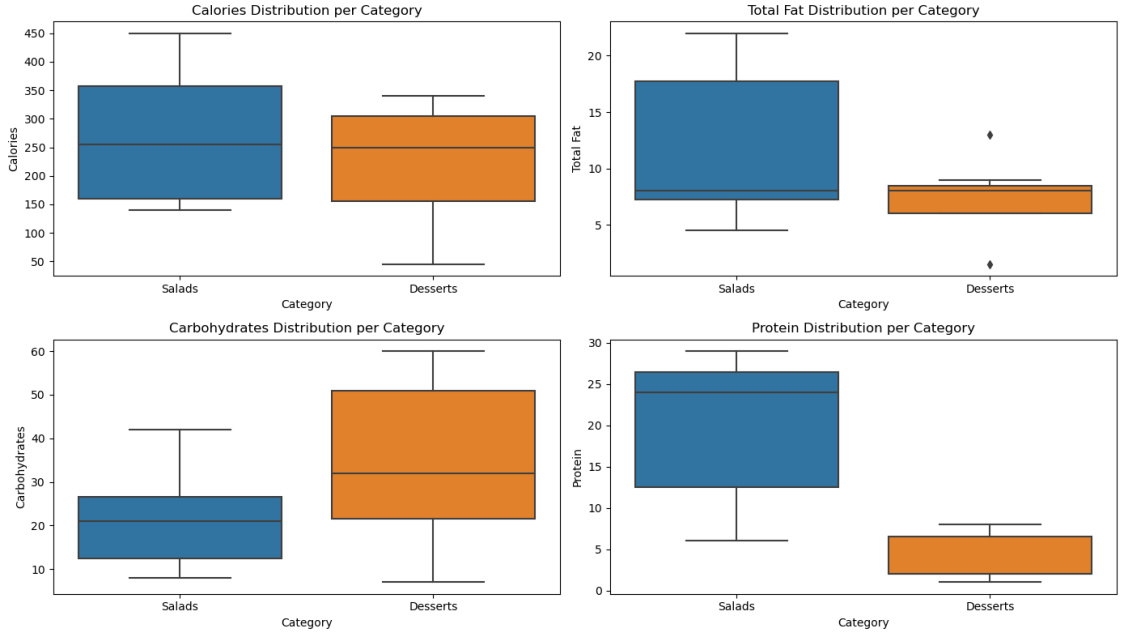


[19]:
```
nutritional_columns = ['Calories', 'Total Fat', 'Carbohydrates', 'Protein']

# Select relevant nutritional columns for comparison
nutritional_columns = ['Calories', 'Total Fat', 'Carbohydrates', 'Protein']

# Filter the data for specific categories: Burgers, Salads, Desserts
selected_categories = df[df['Category'].isin(['Burgers', 'Salads', 'Desserts'])]

# Convert relevant columns to numeric, forcing errors to NaN
for col in nutritional_columns:
    selected_categories[col] = pd.to_numeric(selected_categories[col],␣
 ↪errors='coerce')
```

```
# Drop rows with NaN values
cleaned_categories = selected_categories.dropna(subset=nutritional_columns)

# Bar Charts: Average Nutritional Content per Category
plt.figure(figsize=(14, 8))
for i, col in enumerate(nutritional_columns):
    plt.subplot(2, 2, i + 1)
    avg_nutrition = cleaned_categories.groupby('Category')[col].mean().
 ↪sort_values()
    sns.barplot(x=avg_nutrition, y=avg_nutrition.index)
    plt.title(f'Average {col} per Category')
    plt.xlabel(f'Average {col}')
    plt.ylabel('Category')
plt.tight_layout()
plt.show()

# Box Plots: Distribution of Nutritional Content per Category
plt.figure(figsize=(14, 8))
for i, col in enumerate(nutritional_columns):
    plt.subplot(2, 2, i + 1)
    sns.boxplot(x='Category', y=col, data=cleaned_categories)
    plt.title(f'{col} Distribution per Category')
    plt.xlabel('Category')
    plt.ylabel(col)
plt.tight_layout()
plt.show()

# Pair Plot: Relationships between Nutritional Features in Selected Categories
sns.pairplot(cleaned_categories, hue='Category', vars=nutritional_columns)
plt.suptitle('Nutritional Feature Relationships by Category', y=1.02)
plt.show()
```

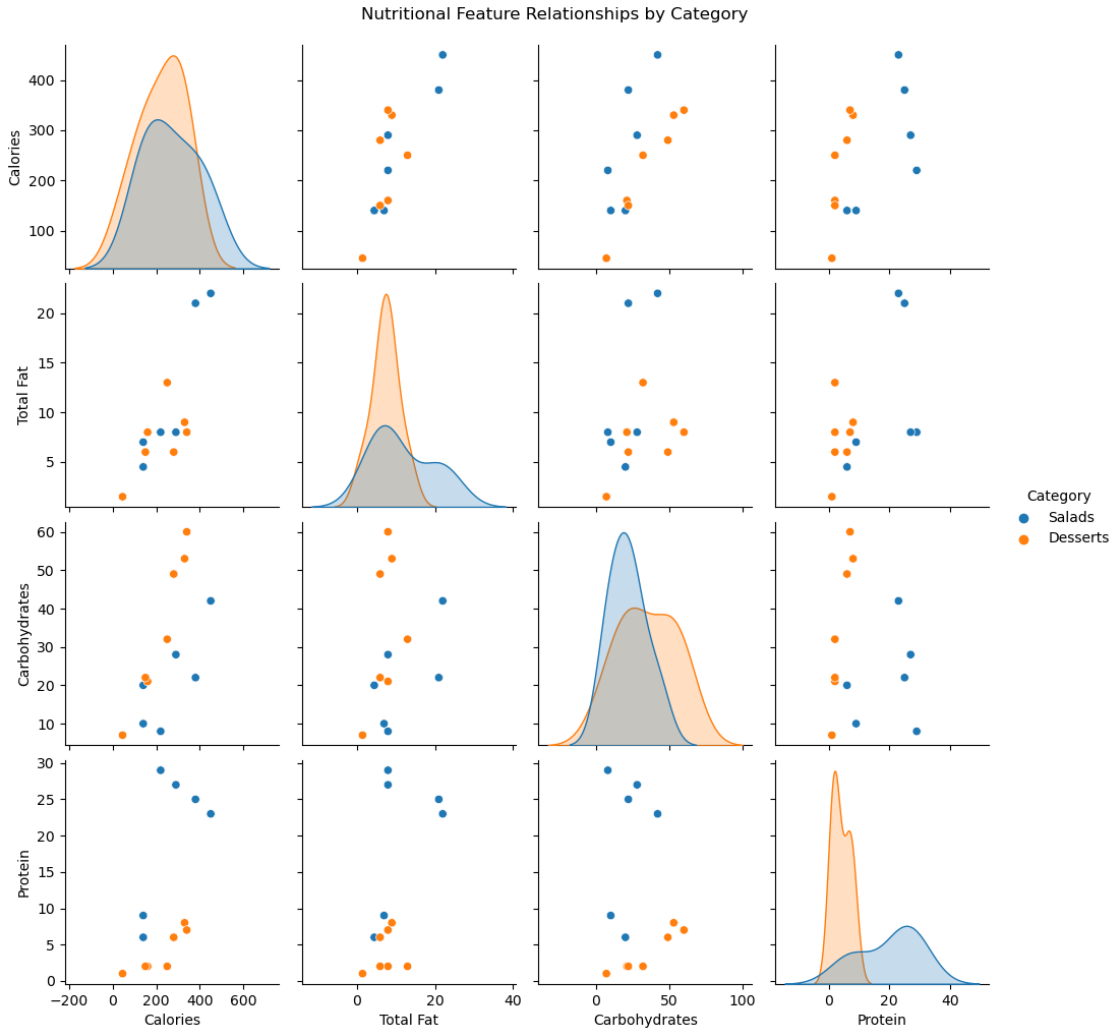
```
C:\Users\Avantikka\AppData\Local\Temp\ipykernel_22040\2090264453.py:11:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  selected_categories[col] = pd.to_numeric(selected_categories[col],
errors='coerce')
```






```
C:\Users\Avantikka\anaconda4\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
C:\Users\Avantikka\anaconda4\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
```

```
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
C:\Users\Avantikka\anaconda4\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
C:\Users\Avantikka\anaconda4\Lib\site-packages\seaborn\_oldcore.py:1119:
FutureWarning: use_inf_as_na option is deprecated and will be removed in a
future version. Convert inf values to NaN before operating instead.
  with pd.option_context('mode.use_inf_as_na', True):
```



[129]:
```
#Determine the average nutritional content of popular menu categories.
# Select relevant nutritional columns for comparison
nutritional_columns = ['Calories', 'Total Fat', 'Carbohydrates', 'Protein']
```

```
# Group by category and calculate the mean for each nutritional metric
average_nutrition = df.groupby('Category')[nutritional_columns].mean().
  ↪reset_index()

print(average_nutrition)
```

	Category	Calories	Total Fat	Carbohydrates	Protein
0	Beef & Pork	494.000000	24.866667	40.133333	27.333333
1	Beverages	113.703704	0.092593	28.814815	1.333333
2	Breakfast	526.666667	27.690476	49.761905	19.857143
3	Chicken & Fish	552.962963	26.962963	49.074074	29.111111
4	Coffee & Tea	283.894737	8.021053	44.526316	8.863158
5	Desserts	222.142857	7.357143	34.857143	4.000000
6	Salads	270.000000	11.750000	21.666667	19.833333
7	Smoothies & Shakes	531.428571	14.125000	90.428571	10.857143
8	Snacks & Sides	245.769231	10.538462	29.153846	8.384615

[ ]: