dsassignment

July 29, 2024

[2]:

```
!pip install numpy matplotlib pandas wordcloud
!pip install plotly
```

```
Requirement already satisfied: numpy in c:\users\pavithra\anaconda3\lib\site-
packages (1.26.4)
Requirement already satisfied: matplotlib in
c:\users\pavithra\anaconda3\lib\site-packages (3.8.4)
Requirement already satisfied: pandas in c:\users\pavithra\anaconda3\lib\site-
packages (2.2.2)
Requirement already satisfied: wordcloud in
c:\users\pavithra\anaconda3\lib\site-packages (1.9.3)
Requirement already satisfied: contourpy>=1.0.1 in
c:\users\pavithra\anaconda3\lib\site-packages (from matplotlib) (1.2.0)
Requirement already satisfied: cycler>=0.10 in
c:\users\pavithra\anaconda3\lib\site-packages (from matplotlib) (0.11.0)
Requirement already satisfied: fonttools>=4.22.0 in
c:\users\pavithra\anaconda3\lib\site-packages (from matplotlib) (4.51.0)
Requirement already satisfied: kiwisolver>=1.3.1 in
c:\users\pavithra\anaconda3\lib\site-packages (from matplotlib) (1.4.4)
Requirement already satisfied: packaging>=20.0 in
c:\users\pavithra\anaconda3\lib\site-packages (from matplotlib) (23.2)
Requirement already satisfied: pillow>=8 in
c:\users\pavithra\anaconda3\lib\site-packages (from matplotlib) (10.3.0)
Requirement already satisfied: pyparsing>=2.3.1 in
c:\users\pavithra\anaconda3\lib\site-packages (from matplotlib) (3.0.9)
Requirement already satisfied: python-dateutil>=2.7 in
c:\users\pavithra\anaconda3\lib\site-packages (from matplotlib) (2.9.0.post0)
Requirement already satisfied: pytz>=2020.1 in
c:\users\pavithra\anaconda3\lib\site-packages (from pandas) (2024.1)
Requirement already satisfied: tzdata>=2022.7 in
c:\users\pavithra\anaconda3\lib\site-packages (from pandas) (2023.3)
Requirement already satisfied: six>=1.5 in c:\users\pavithra\anaconda3\lib\site-
packages (from python-dateutil>=2.7->matplotlib) (1.16.0)
Requirement already satisfied: plotly in c:\users\pavithra\anaconda3\lib\site-
packages (5.22.0)
Requirement already satisfied: tenacity>=6.2.0 in
c:\users\pavithra\anaconda3\lib\site-packages (from plotly) (8.2.2)
Requirement already satisfied: packaging in
```

```
c:\users\pavithra\anaconda3\lib\site-packages (from plotly) (23.2)
```

[3]:
```
import pandas as pd
import seaborn as sns
import plotly.graph_objects as go
import plotly.express as px
import matplotlib.pyplot as plt
from wordcloud import WordCloud
```

[4]:
```
file=r"C:\Users\Pavithra\Downloads\food_coded.csv"
food=pd.read_csv(file)
```

[5]:
```
import os
print(os.getcwd())
```

```
C:\Users\Pavithra
```

[7]:
```
food.head()
```

[7]:
```
     GPA  Gender  breakfast  calories_chicken  calories_day  calories_scone  \
0    2.4       2          1               430           NaN           315.0
1  3.654       1          1               610           3.0           420.0
2    3.3       1          1               720           4.0           420.0
3    3.2       1          1               430           3.0           420.0
4    3.5       1          1               720           2.0           420.0

  coffee                      comfort_food        comfort_food_reasons  \
0      1                              none       we dont have comfort
1      2          chocolate, chips, ice cream       Stress, bored, anger
2      2      frozen yogurt, pizza, fast food           stress, sadness
3      2    Pizza, Mac and cheese, ice cream                   Boredom
4      2        Ice cream, chocolate, chips   Stress, boredom, cravings

  comfort_food_reasons_coded  …  soup  sports  thai_food tortilla_calories  \
0                        9.0  …   1.0     1.0          1            1165.0
1                        1.0  …   1.0     1.0          2             725.0
2                        1.0  …   1.0     2.0          5            1165.0
3                        2.0  …   1.0     2.0          5             725.0
4                        1.0  …   1.0     1.0          4             940.0

  turkey_calories  type_sports veggies_day  vitamins  waffle_calories  \
0             345   car racing           5         1             1315
1             690   Basketball           4         2              900
2             500         none           5         1              900
3             690          NaN           3         1             1315
4             500     Softball           4         2              760
```

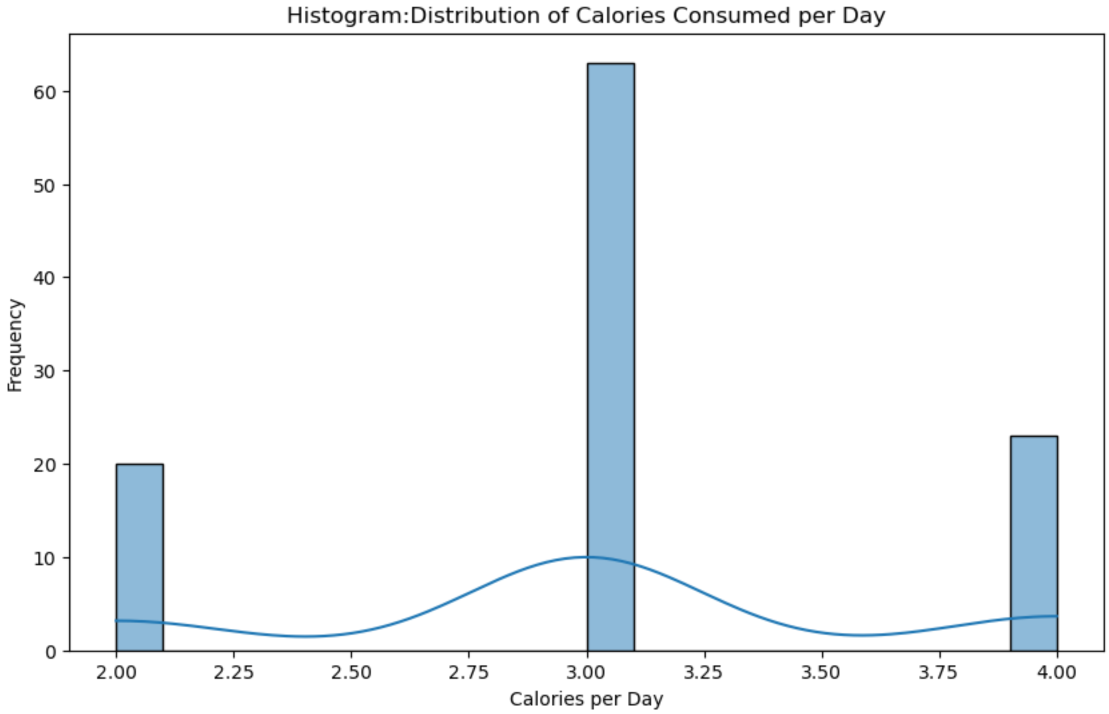
```
                      weight
0                        187
1                        155
2  I'm not answering this.
3              Not sure, 240
4                        190

[5 rows x 61 columns]
```

[8]:
```
food.info()
```

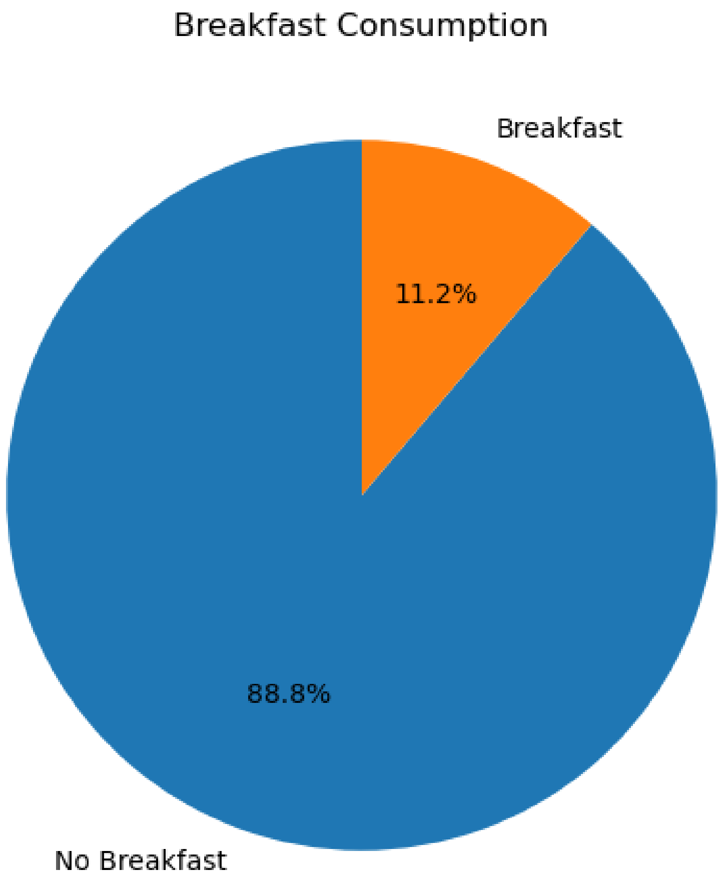
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 125 entries, 0 to 124
Data columns (total 61 columns):
 #   Column                        Non-Null Count  Dtype
---  ------                        --------------  -----
 0   GPA                           123 non-null    object
 1   Gender                        125 non-null    int64
 2   breakfast                     125 non-null    int64
 3   calories_chicken              125 non-null    int64
 4   calories_day                  106 non-null    float64
 5   calories_scone                124 non-null    float64
 6   coffee                        125 non-null    int64
 7   comfort_food                  124 non-null    object
 8   comfort_food_reasons          123 non-null    object
 9   comfort_food_reasons_coded    106 non-null    float64
 10  cook                          122 non-null    float64
 11  comfort_food_reasons_coded.1  125 non-null    int64
 12  cuisine                       108 non-null    float64
 13  diet_current                  124 non-null    object
 14  diet_current_coded            125 non-null    int64
 15  drink                         123 non-null    float64
 16  eating_changes                122 non-null    object
 17  eating_changes_coded          125 non-null    int64
 18  eating_changes_coded1         125 non-null    int64
 19  eating_out                    125 non-null    int64
 20  employment                    116 non-null    float64
 21  ethnic_food                   125 non-null    int64
 22  exercise                      112 non-null    float64
 23  father_education              124 non-null    float64
 24  father_profession             122 non-null    object
 25  fav_cuisine                   123 non-null    object
 26  fav_cuisine_coded             125 non-null    int64
 27  fav_food                      123 non-null    float64
 28  food_childhood                124 non-null    object
 29  fries                         125 non-null    int64
 30  fruit_day                     125 non-null    int64
 31  grade_level                   125 non-null    int64
 32  greek_food                    125 non-null    int64
 33  healthy_feeling               125 non-null    int64
 34  healthy_meal                  124 non-null    object
 35  ideal_diet                    124 non-null    object
 36  ideal_diet_coded              125 non-null    int64
 37  income                        124 non-null    float64
 38  indian_food                   125 non-null    int64
 39  italian_food                  125 non-null    int64
 40  life_rewarding                124 non-null    float64
 41  marital_status                124 non-null    float64
 42  meals_dinner_friend           122 non-null    object
 43  mother_education              122 non-null    float64
 44  mother_profession             123 non-null    object
 45  nutritional_check             125 non-null    int64
 46  on_off_campus                 124 non-null    float64
 47  parents_cook                  125 non-null    int64
 48  pay_meal_out                  125 non-null    int64
 49  persian_food                  124 non-null    float64
 50  self_perception_weight        124 non-null    float64
 51  soup                          124 non-null    float64
 52  sports                        123 non-null    float64
 53  thai_food                     125 non-null    int64
 54  tortilla_calories             124 non-null    float64
 55  turkey_calories               125 non-null    int64
 56  type_sports                   99 non-null     object
 57  veggies_day                   125 non-null    int64
 58  vitamins                      125 non-null    int64
 59  waffle_calories               125 non-null    int64
 60  weight                        123 non-null    object
dtypes: float64(20), int64(27), object(14)
memory usage: 59.7+ KB
```

[9]:

```
# 1. HISTOGRAM
plt.figure(figsize=(10, 6))
sns.histplot(food['calories_day'].dropna(), bins=20, kde=True)
plt.title('Histogram:Distribution of Calories Consumed per Day')
plt.xlabel('Calories per Day')
plt.ylabel('Frequency')
plt.show()
```

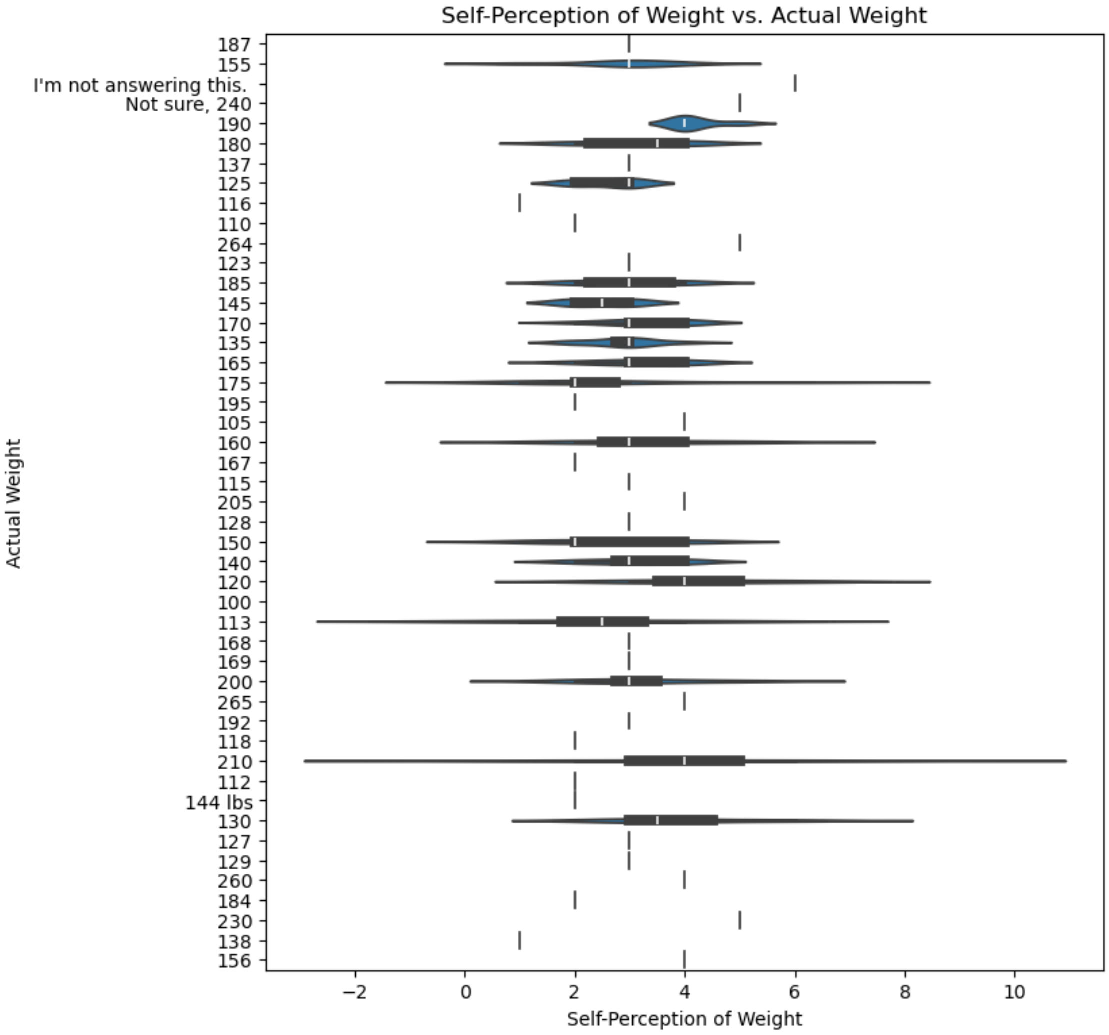


[17]:
```
# 2. Pie Chart - Breakfast Consumption
breakfast_counts = food['breakfast'].value_counts()
plt.figure(figsize=(8, 6))
plt.pie(breakfast_counts, labels=['No Breakfast', 'Breakfast'], autopct='%1.
 ↪1f%%', startangle=90)
plt.title('Breakfast Consumption')
plt.show()
```



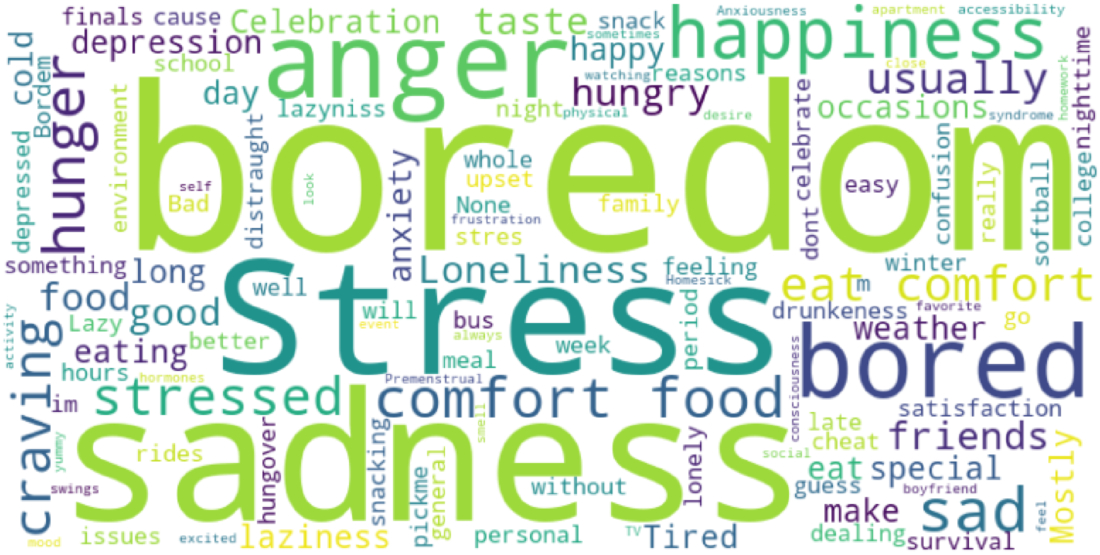
[28]:

```
# 3. Violin Plot - Self-Perception of Weight vs. Actual Weight
plt.figure(figsize=(8, 9))
sns.violinplot(x='self_perception_weight', y='weight', data=food)
plt.title('Self-Perception of Weight vs. Actual Weight')
plt.xlabel('Self-Perception of Weight')
plt.ylabel('Actual Weight')
plt.show()
```

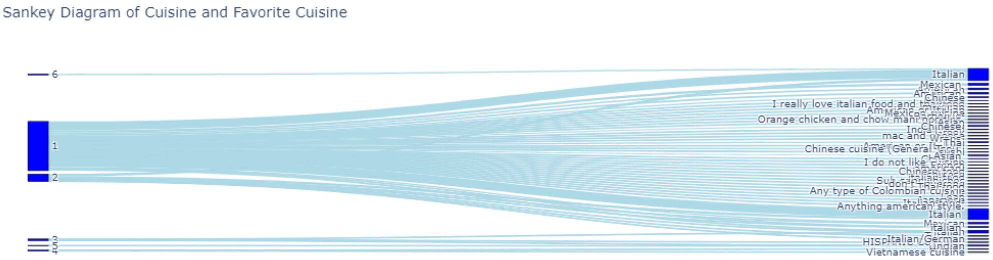


[24]:
```
# 4. Word Cloud - Comfort Food Reasons
comfort_food_reasons = ' '.join(food['comfort_food_reasons'].dropna().
 ↪astype(str))
wordcloud = WordCloud(width=800, height=400, background_color='white').
 ↪generate(comfort_food_reasons)

plt.figure(figsize=(10, 8))
plt.imshow(wordcloud, interpolation='bilinear')
plt.axis('off')
plt.title('Comfort Food Reasons Word Cloud')
plt.show()
```

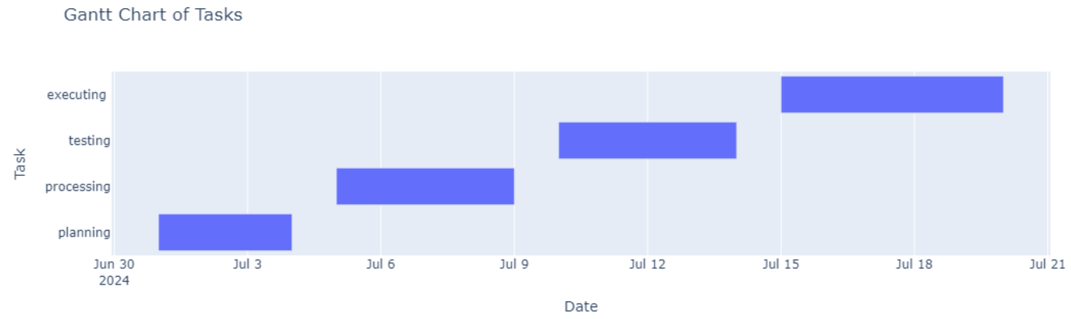
Comfort Food Reasons Word Cloud



[36]:
```
# 5. Sankey Diagram

food = food.dropna(subset=['cuisine', 'fav_cuisine'])

flow_data = food.groupby(['cuisine', 'fav_cuisine']).size().
 ↪reset_index(name='count')

# Create lists for source, target, and value for the Sankey Diagram
sources = flow_data['cuisine'].tolist()
targets = flow_data['fav_cuisine'].tolist()
values = flow_data['count'].tolist()

# Create a mapping from category names to index
all_nodes = list(set(sources + targets))
mapping = {node: i for i, node in enumerate(all_nodes)}

# Map sources and targets to their respective indices
sources = [mapping[source] for source in sources]
targets = [mapping[target] for target in targets]

# Create the Sankey Diagram
fig = go.Figure(data=[go.Sankey(
    node=dict(
        pad=15,
        thickness=20,
        line=dict(color="black", width=0.5),
        label=all_nodes,
        color="blue"
    ),
    link=dict(
        source=sources,
        target=targets,
        value=values,
        color="lightblue"
    )
)])

fig.update_layout(title_text="Sankey Diagram of Cuisine and Favorite Cuisine",␣
  ↪font_size=10)
fig.show()
```

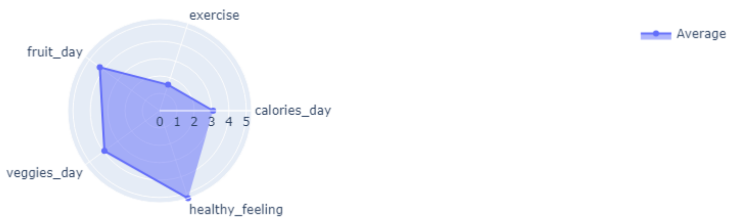


[38]:
```
# 6. Gannt chart
data = {
    'Task': ['planning', 'processing', 'testing', 'executing '],
    'Start': ['2024-07-01', '2024-07-05', '2024-07-10', '2024-07-15'],
    'End': ['2024-07-04', '2024-07-09', '2024-07-14', '2024-07-20']
}

df = pd.DataFrame(data)
df['Start'] = pd.to_datetime(df['Start'])
df['End'] = pd.to_datetime(df['End'])

fig = px.timeline(df, x_start='Start', x_end='End', y='Task', title='Gantt␣
  ↪Chart of Tasks')
fig.update_yaxes(categoryorder="total ascending")  # Optional: Order tasks by␣
  ↪duration
fig.update_layout(xaxis_title='Date', yaxis_title='Task')
fig.show()
```



[39]:
```
# 7.  radar chart
# Select the columns for the radar chart
columns = ['calories_day', 'exercise', 'fruit_day', 'veggies_day',␣
  ↪'healthy_feeling']

# Remove rows with missing values in the selected columns
subset = food[columns].dropna()

# Take the mean of the selected columns for plotting
data_mean = subset.mean()

# Create the radar chart
fig = go.Figure()

fig.add_trace(go.Scatterpolar(
    r=data_mean,
    theta=columns,
    fill='toself',
    name='Average'
))

fig.update_layout(
    polar=dict(
        radialaxis=dict(
            visible=True,
            range=[0, max(data_mean)]
        )),
    showlegend=True,
    title='Radar Chart of Selected Food and Health Variables'
)

fig.show()
```

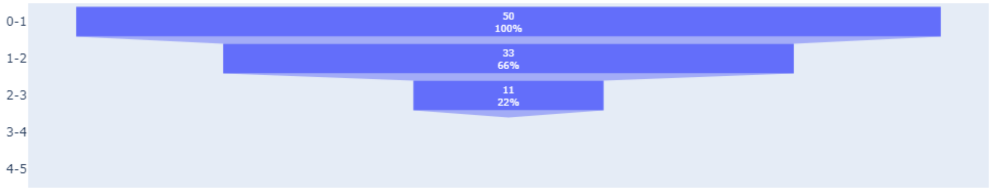
Radar Chart of Selected Food and Health Variables



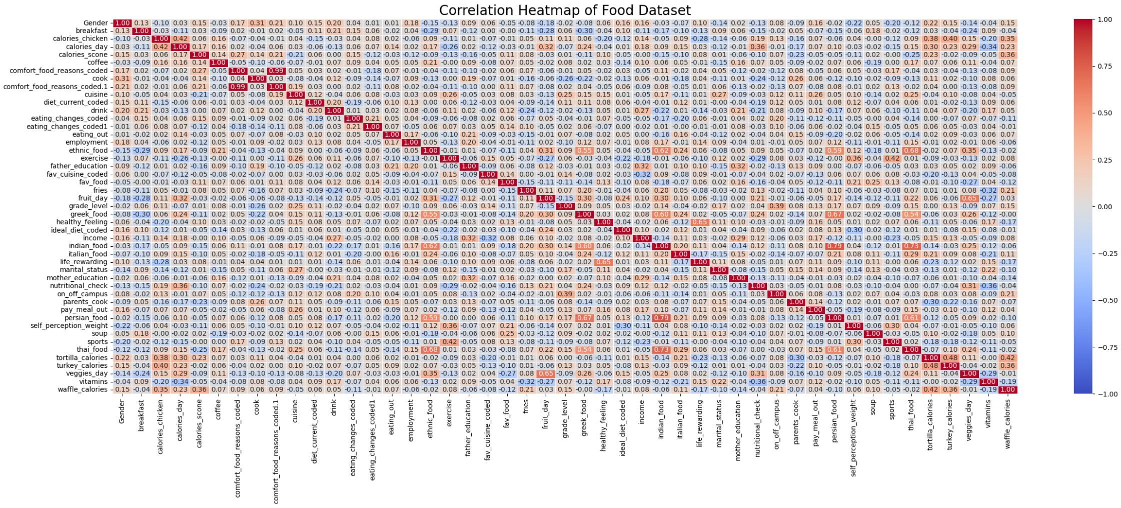
[40]:

```python
# 8. funnel chart

# Create bins for exercise levels
exercise_bins = pd.cut(food['exercise'].dropna(), bins=[0, 1, 2, 3, 4, 5], labels=['0-1', '1-2', '2-3', '3-4', '4-5'])

# Count the number of entries in each bin
exercise_counts = exercise_bins.value_counts().sort_index()

# Create the funnel chart
fig = go.Figure(go.Funnel(
    y = exercise_counts.index.astype(str),
    x = exercise_counts.values,
    textinfo = "value+percent initial"))

fig.update_layout(
    title='Funnel Chart of Exercise Levels'
)

fig.show()
```

Funnel Chart of Exercise Levels

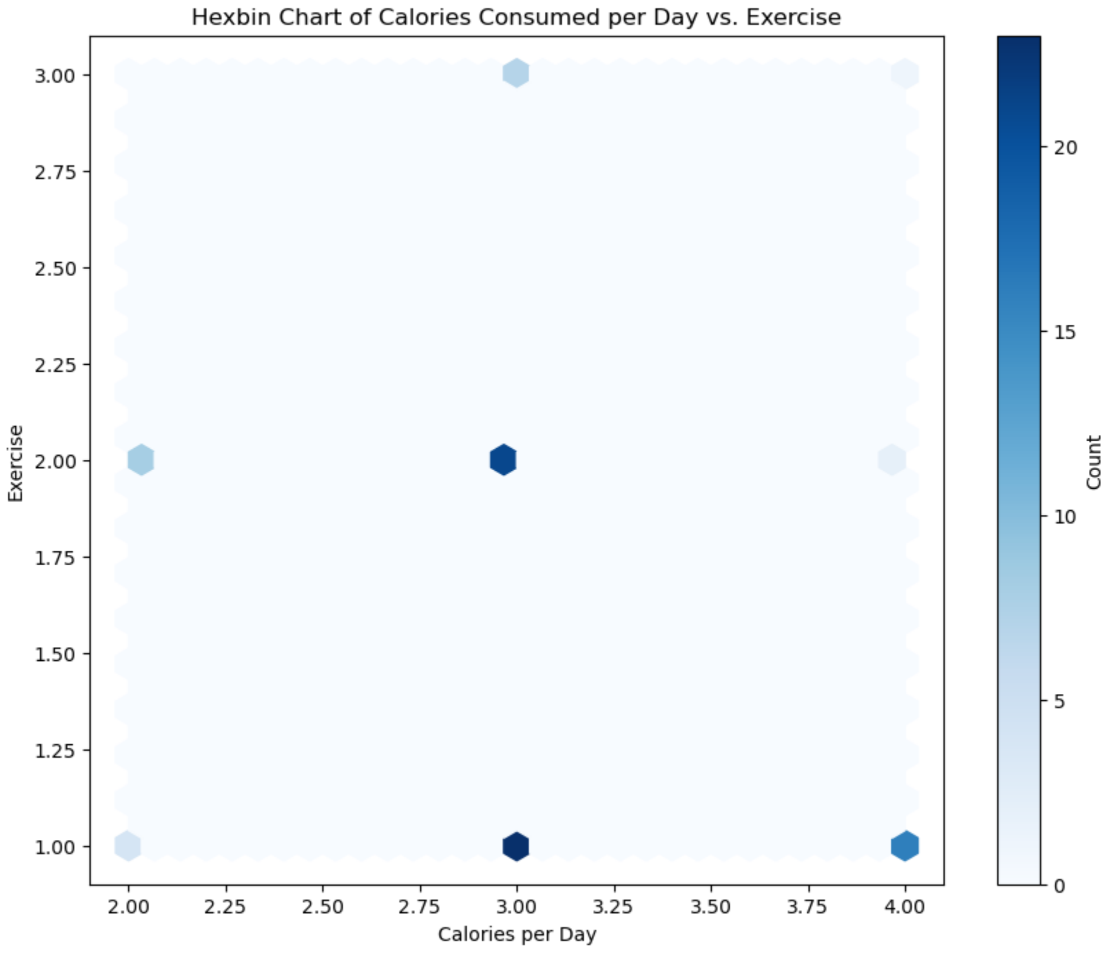


[13]:
```python
#9. Heat map

# Select only the numeric columns
numeric_columns = food.select_dtypes(include=['float64', 'int64'])

# Calculate the correlation matrix
correlation_matrix = numeric_columns.corr()

# Set up the matplotlib figure
plt.figure(figsize=(30, 10))

# Draw the heatmap with the mask and correct aspect ratio
sns.heatmap(correlation_matrix, annot=True, fmt=".2f", cmap='coolwarm',␣
 ↪vmin=-1, vmax=1, linewidths=0.5)

# Set the title
plt.title('Correlation Heatmap of Food Dataset', size=20)

# Show the plot
plt.show()
```



[43]:
```python
# 10. hexbin plot

# Drop rows with missing values in the selected columns
subset = food[['calories_day', 'exercise']].dropna()

# Create the hexbin plot
plt.figure(figsize=(10, 8))
plt.hexbin(subset['calories_day'], subset['exercise'], gridsize=30,␣
 ↪cmap='Blues')
```

```
# Add color bar
plt.colorbar(label='Count')

# Set titles and labels
plt.title('Hexbin Chart of Calories Consumed per Day vs. Exercise')
plt.xlabel('Calories per Day')
plt.ylabel('Exercise')

# Show plot
plt.show()
```



[ ]: