Clean & Analyze Social Media

# Introduction Social media has become a ubiquitous part of modern life, with platforms such as Instagram, Twitter, and Facebook serving as essential communication channels. Social media data sets are vast and complex, making analysis a challenging task for businesses and researchers alike. In this project, we explore a simulated social media, for example Tweets, data set to understand trends in likes across different categories. The objective of this project is to analyze social media data and gain insights into user engagement. We will explore the data set using visualization techniques to understand the distribution of likes across different categories. Finally, we will analyze the data to draw conclusions about the most popular categories and the overall engagement on the platform.

Importing required libraries

In [1]:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import random
```

Generating random data for the social media data

In [2]:

```
n = 500
categories = ['Food', 'Travel', 'Fashion', 'Fitness', 'Music', 'Culture',
'Family', 'Health']
data = {
    'User Id': range(1, n + 1),
    'Category': [random.choice(categories) for _ in range(n)],
    'Post Type': [random.choice(['Text', 'Image', 'Video']) for _ in range
(n)],
    'Date': pd.date_range('2021-01-01', periods=n),
    'Age': np.random.randint(13, 72, size=n),
    'Gender': np.random.randint(0, 2, size=n),  # 0 for male, 1 for female
    'Likes': np.random.randint(0, 10000, size=n),
    'Comments': np.random.randint(0, 1000, size=n),
    'Shares': np.random.randint(0, 1000, size=n),
    'Views': np.random.randint(0, 100000, size=n),
    'Engagement': np.random.randint(1, 100, size=n),  # Simulated engagemen
t metric
    'Followers Count': np.random.randint(100, 10000, size=n)  # Simulated f
ollowers count
}
```

These random variables were generated to mimic a social media dataset, facilitating analysis and exploration of user behaviors and engagement patterns across various content categories and post types. # Variables Documentation: My Random Variables: 1. User ID: Unique identification number assigned to each user. 2. Category: Represents the type of content posted, selected randomly from options like Food, Travel, Fashion, etc. 3. Post Type: Indicates the format of the post (Text, Image, Video). 4. Date: Timestamp indicating when the post was made, ranging from '2021-01-01' to a period of 'n'. 5. Age: Randomly generated age of the users, ranging from 13 to 72 years old. 6. Gender: Binary representation (0 for male, 1 for female) denoting the user's gender. 7.

Likes: Random count of likes received for the post, ranging from 0 to 10,000. 8. Comments: Random count of comments received on the post, ranging from 0 to 1,000. 9. Shares: Random count of shares received for the post, ranging from 0 to 1,000. 10. Views: Random count of views on the post, ranging from 0 to 100,000. 11. Engagement: Simulated metric representing the level of interaction with the post, ranging from 1 to 100. 12. Followers Count: Simulated count of followers a user has, ranging from 100 to 10,000.

In [32]:
```
SM.to_csv('social_media_data.csv', index=False)
```

Loading and Exploring Data

In [3]:
```
SM = pd.DataFrame(data)
SM.head(3)
```

Out[3]:

	User Id	Category	Post Type	Date	Age	Gender	Likes	Comments	Shares	Views	Engagemer
0	1	Fitness	Image	2021-01-01	13	1	8946	962	554	19769	3
1	2	Health	Text	2021-01-02	41	0	35	703	736	19869	4
2	3	Food	Image	2021-01-03	28	0	592	752	181	43544	3

In [4]:
```
SM.tail(3)
```

Out[4]:

	User Id	Category	Post Type	Date	Age	Gender	Likes	Comments	Shares	Views	Engagem
497	498	Fashion	Text	2022-05-13	54	0	8186	561	3	47506	
498	499	Travel	Video	2022-05-14	71	0	4418	984	501	17607	
499	500	Food	Image	2022-05-15	36	0	7609	604	979	20068	

In [5]:
```
SM.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 500 entries, 0 to 499
Data columns (total 12 columns):
 #   Column           Non-Null Count  Dtype
---  ------           --------------  -----
 0   User Id          500 non-null    int64
 1   Category         500 non-null    object
 2   Post Type        500 non-null    object
 3   Date             500 non-null    datetime64[ns]
 4   Age              500 non-null    int64
 5   Gender           500 non-null    int64
 6   Likes            500 non-null    int64
 7   Comments         500 non-null    int64
 8   Shares           500 non-null    int64
 9   Views            500 non-null    int64
 10  Engagement       500 non-null    int64
 11  Followers Count  500 non-null    int64
dtypes: datetime64[ns](1), int64(9), object(2)
memory usage: 47.0+ KB
```

In [6]:
```
SM.describe()
```

Out[6]:

	User Id	Age	Gender	Likes	Comments	Shares	Views
count	500.000000	500.000000	500.000000	500.000000	500.000000	500.000000	500.000000
mean	250.500000	41.512000	0.466000	4995.168000	516.576000	507.204000	51557.750000
std	144.481833	16.549611	0.499342	2939.869857	284.840736	289.300162	29315.463786
min	1.000000	13.000000	0.000000	23.000000	4.000000	0.000000	202.000000
25%	125.750000	28.000000	0.000000	2420.750000	276.000000	257.750000	26449.000000
50%	250.500000	41.500000	0.000000	5057.500000	534.000000	520.500000	52138.500000
75%	375.250000	55.000000	1.000000	7586.500000	762.000000	757.000000	77361.500000
max	500.000000	71.000000	1.000000	9985.000000	998.000000	999.000000	99707.000000

In [7]:
```
print(SM['Category'].value_counts())
```

```
Travel     68
Health     65
Music      65
Culture    65
Food       64
Fitness    59
Fashion    58
Family     56
Name: Category, dtype: int64
```

In [8]:

```
print(SM['Post Type'].value_counts())
```

```
Text     177
Image    175
Video    148
Name: Post Type, dtype: int64
```

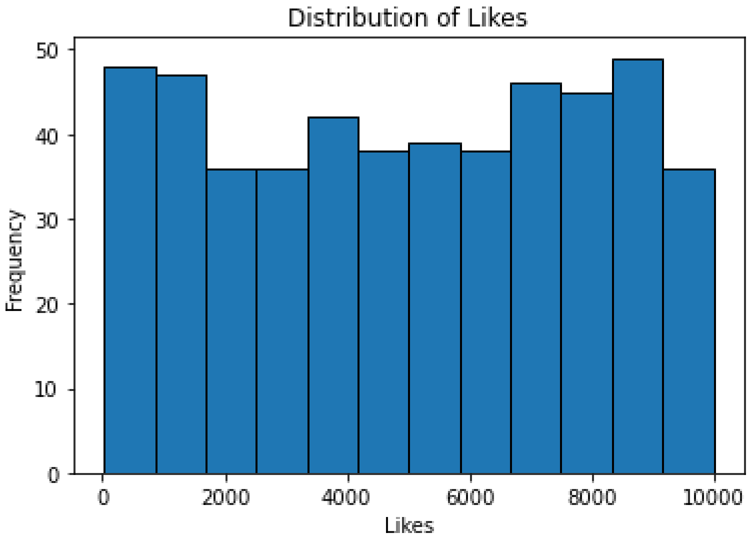
In [9]:

```
#I have no null values but the process of cleaning would be as the followin
g:
SM.dropna(inplace=True)
```

Visualize and Analyze the data

In [10]:

```
# Visualize 'Likes' with a histogram using Matplotlib
plt.hist(SM['Likes'], bins=12, edgecolor ="black")
plt.xlabel('Likes')
plt.ylabel('Frequency')
plt.title('Distribution of Likes')
plt.show()
```



This visualization helps in understanding the spread and concentration of the 'Likes' values within the specified bins.

In [11]:

```
# Calculate and print the mean of 'Likes'
print(f"Mean Likes: {SM['Likes'].mean()}")
```

```
Mean Likes: 4995.168
```

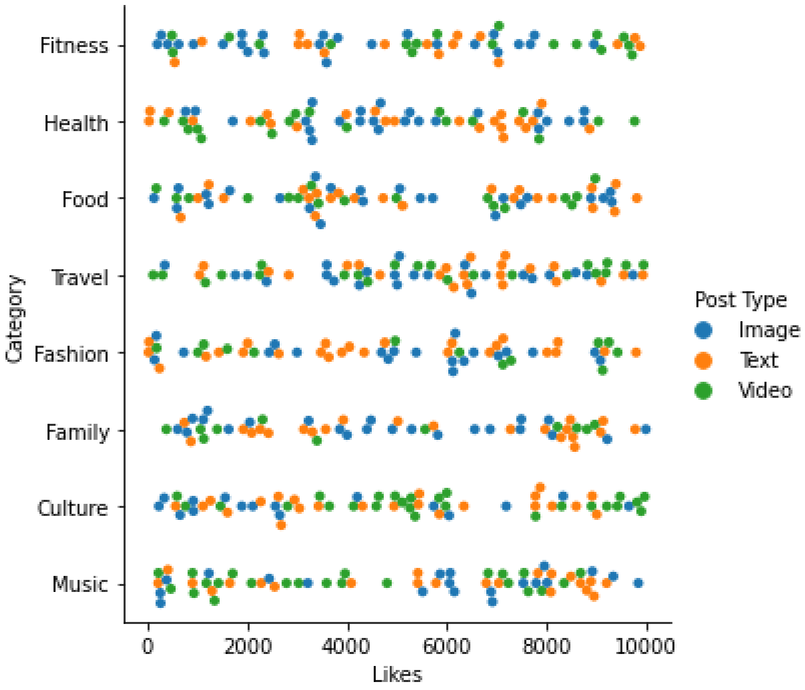
In [12]:

```
# Visualize 'Likes' per catergories and post types

sns.catplot(data=SM, x="Likes", y="Category", hue="Post Type", kind="swarm")
```

Out[12]:

```
<seaborn.axisgrid.FacetGrid at 0x7fd5f689cad0>
```



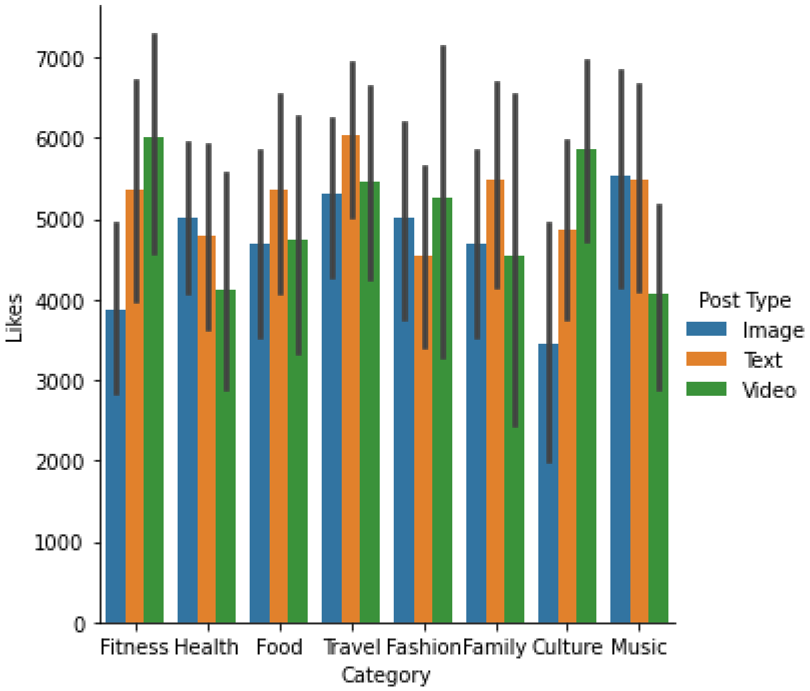
The 'swarm' plot kind represents individual data points in a categorical arrangement, where each point's position on the category axis reflects the 'Likes' value, segregated by both 'Category' and 'Post Type'. This visualization aids in understanding how 'Likes' are distributed within various categories and post types, allowing for a comparative analysis of their distribution patterns.

In [13]:

```
sns.catplot(data=SM, x="Category", y="Likes", hue="Post Type", kind="bar")
```

Out[13]:

```
<seaborn.axisgrid.FacetGrid at 0x7fd5f6727650>
```



In [ ]:

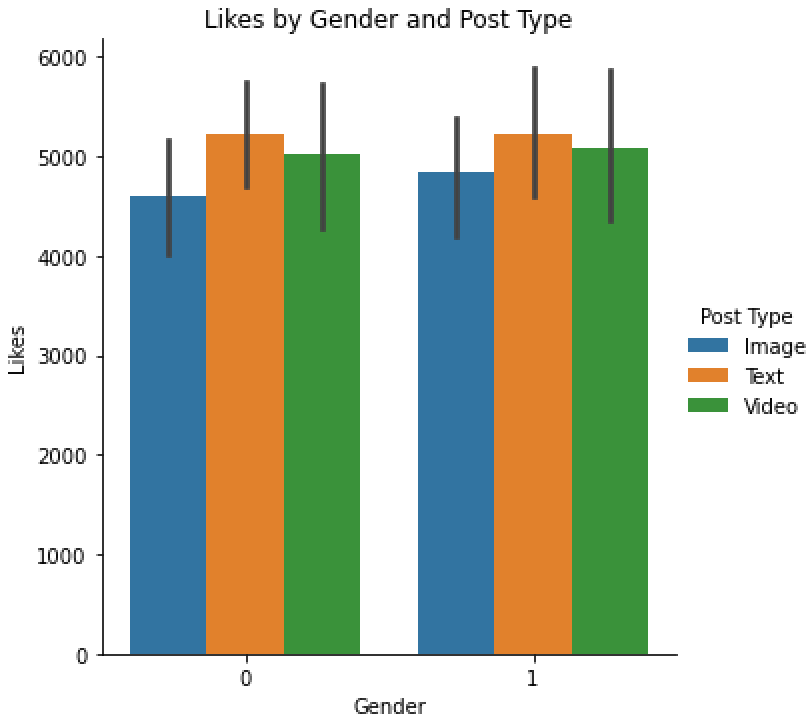
```
As the previous catplot visualisation, This visualization also enables a co
mparative analysis of 'Likes' across various categories and post types, pro
viding insight into their relative magnitudes within each category.
```

In [14]:

```
sns.catplot(data=SM, x="Gender", y="Likes", hue="Post Type", kind="bar")
plt.title("Likes by Gender and Post Type")
```

Out[14]:

```
Text(0.5, 1.0, 'Likes by Gender and Post Type')
```



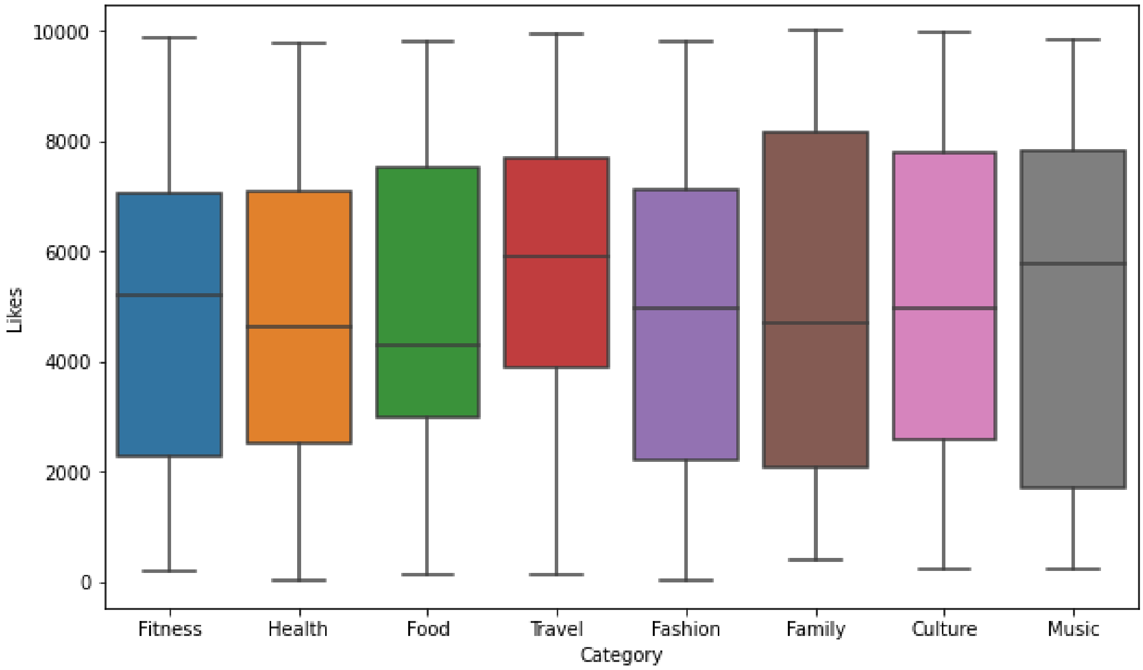
In [15]:

```
# Group by 'Post Type' and calculate the mean of 'Likes'and
mean_likes_type= SM.groupby('Post Type')['Likes'].mean()
print("Mean Likes per Post Type:")
print(mean_likes_type)
```

```
Mean Likes per Post Type:
Post Type
Image    4717.142857
Text     5223.322034
Video    5051.054054
Name: Likes, dtype: float64
```

In [16]:

```
# Create a boxplot for 'Category' vs 'Likes'
plt.figure(figsize=(10, 6))
sns.boxplot(x='Category', y='Likes', data=SM)
plt.show()
```



In [17]:

```
# Group by 'Category' and calculate the mean of 'Likes'
mean_likes_category = SM.groupby('Category')['Likes'].mean()
print("Mean Likes per Category:")
print(mean_likes_category)
```

```
Mean Likes per Category:
Category
Culture     4914.923077
Family      4970.357143
Fashion     4867.620690
Fitness     4920.847458
Food        4937.671875
Health      4695.723077
Music       4999.984615
Travel      5601.323529
Name: Likes, dtype: float64
```

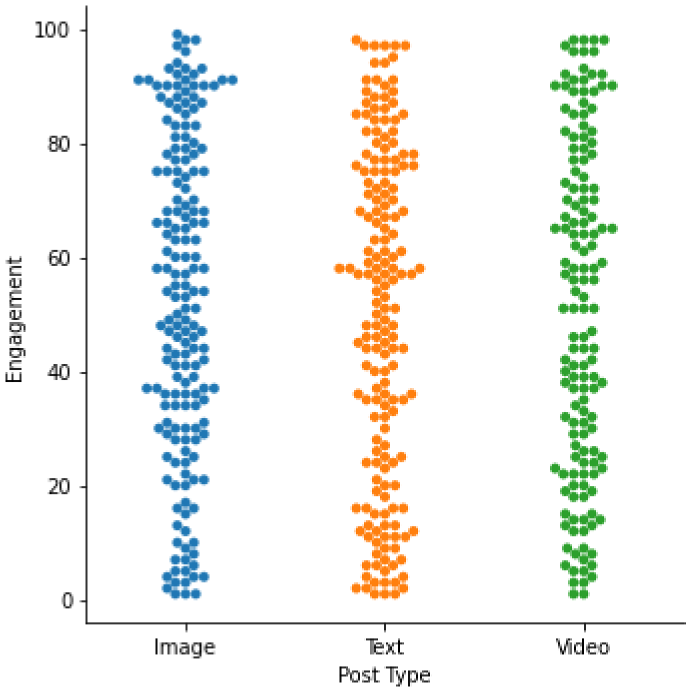
In [30]:

```
mean_G_category = SM.groupby('Category')['Gender'].mean()
print("Gender per Category:")
print(mean_G_category)
```

```
Gender per Category:
Category
Culture     0.476923
Family      0.517857
Fashion     0.362069
Fitness     0.491525
Food        0.375000
Health      0.538462
Music       0.492308
Travel      0.470588
Name: Gender, dtype: float64
```

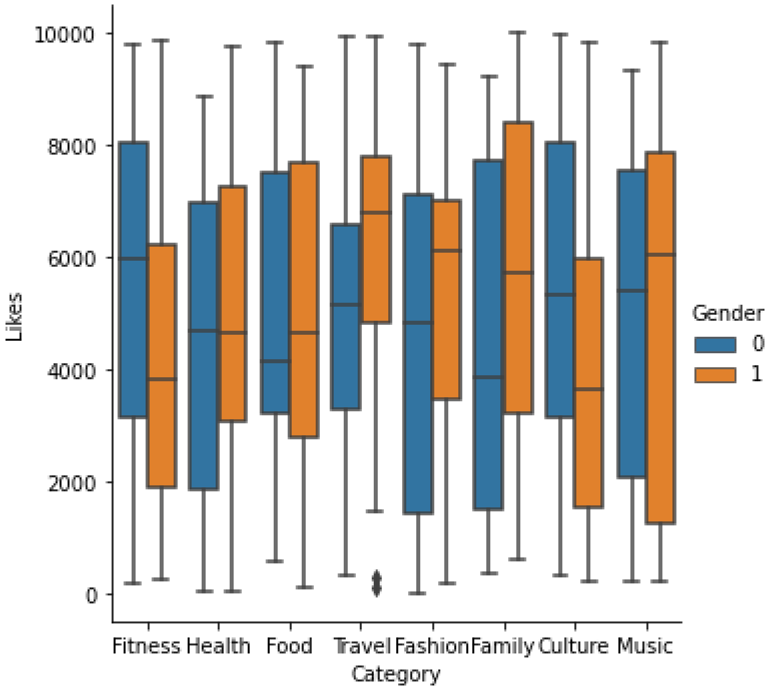
```
In [18]: # Visualize 'Engagement' & Post Types
         sns.catplot(data=SM, x="Post Type", y="Engagement", kind="swarm")
```

```
Out[18]: <seaborn.axisgrid.FacetGrid at 0x7fd5f4ddf190>
```



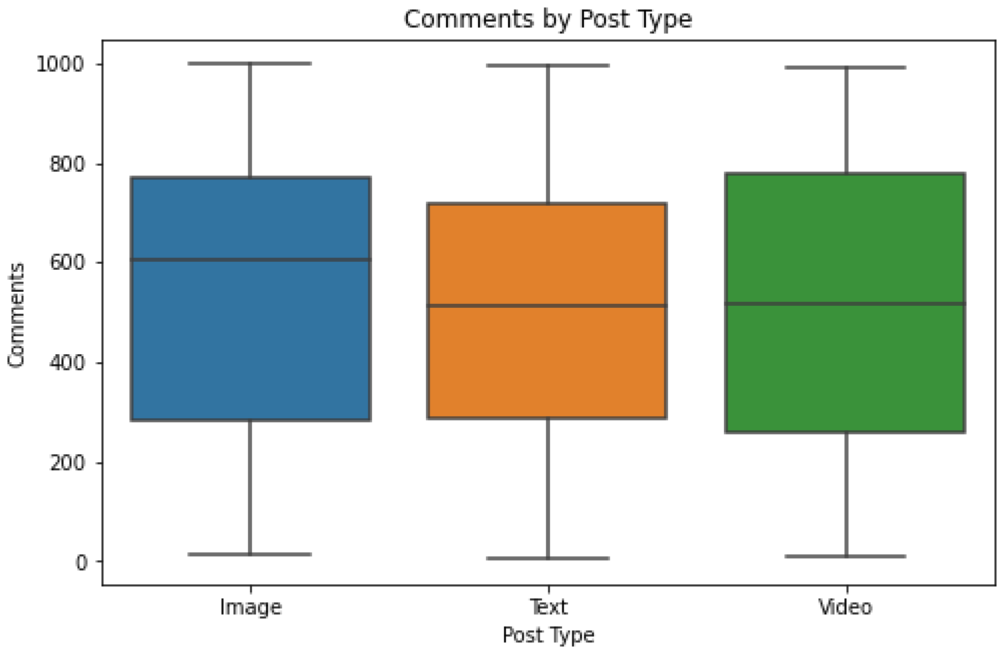
```
In [19]: #Analyzing the difference of likes for genders by categories
         sns.catplot(data=SM, x="Category", y="Likes", hue="Gender", kind="box")
```

```
Out[19]: <seaborn.axisgrid.FacetGrid at 0x7fd5f4dfea50>
```



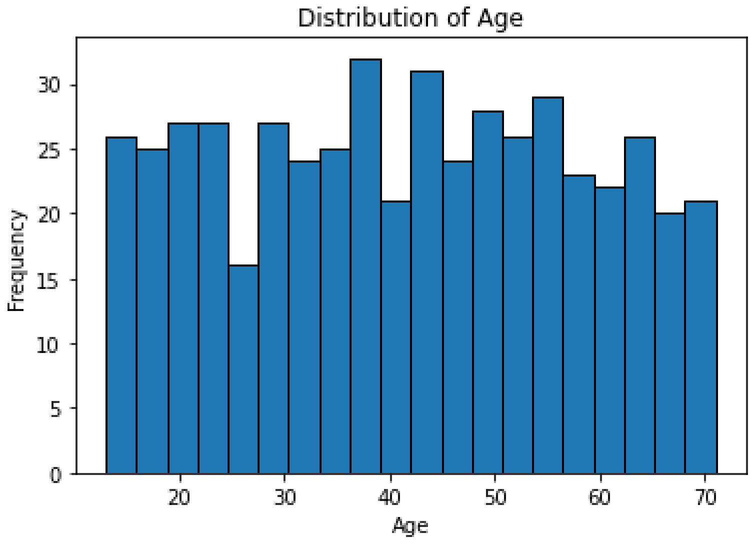
In [20]:

```
# Create a boxplot for 'Post Type' vs 'Comments'
plt.figure(figsize=(8, 5))
sns.boxplot(x='Post Type', y='Comments', data=SM)
plt.title('Comments by Post Type')
plt.show()
```

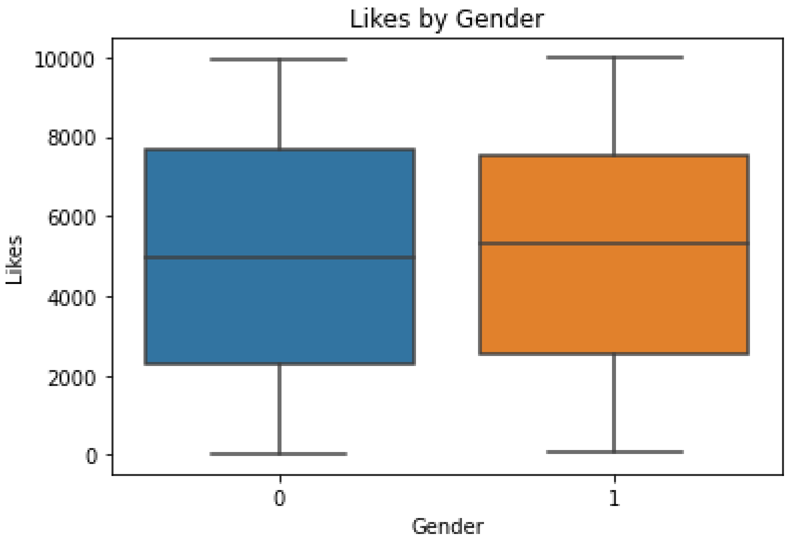


In [21]:

```
# Visualize 'Age' with a histogram using Matplotlib
plt.hist(SM['Age'], bins=20, edgecolor='black')
plt.xlabel('Age')
plt.ylabel('Frequency')
plt.title('Distribution of Age')
plt.show()
```



```
In [22]: # Create a boxplot for 'Gender' vs 'Likes'
         plt.figure(figsize=(6, 4))
         sns.boxplot(x='Gender', y='Likes', data=SM)
         plt.title('Likes by Gender')
         plt.show()
```

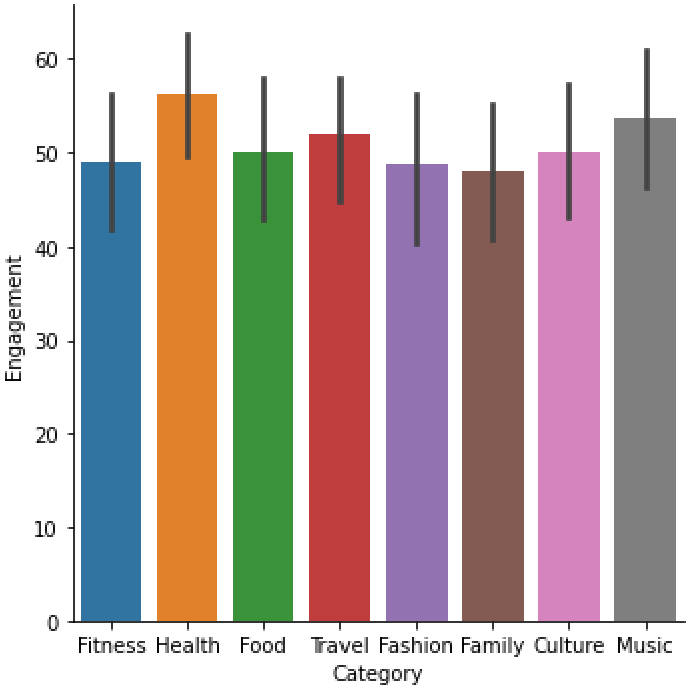


```
In [23]: # Group by 'Gendr' and calculate the mean of 'Likes'
         mean_likes_category = SM.groupby('Gender')['Likes'].mean()
         print("Mean Likes per Category:")
         print(mean_likes_category)
```

```
Mean Likes per Category:
Gender
0    4958.127341
1    5037.613734
Name: Likes, dtype: float64
```

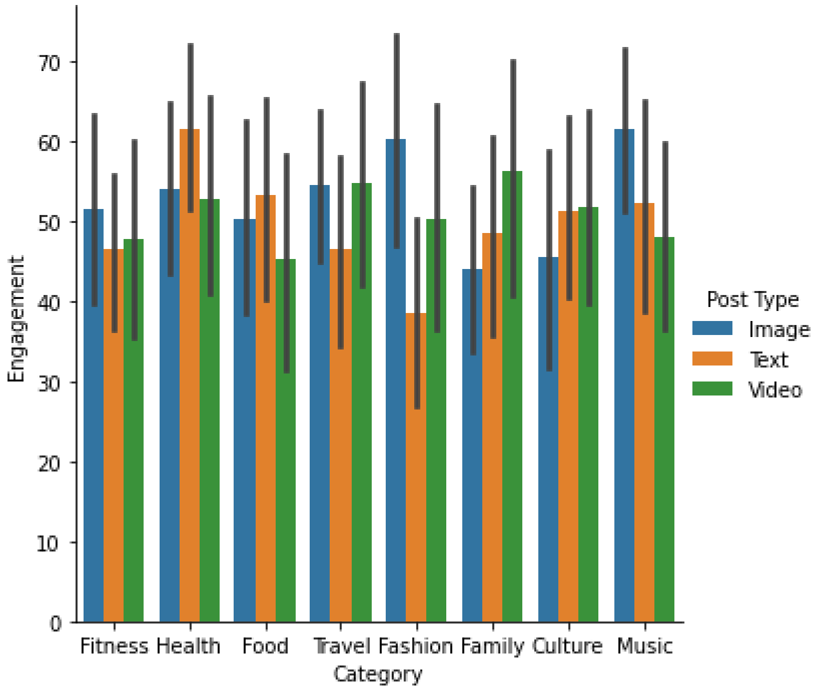
```
In [24]: sns.catplot(data=SM, x="Category", y="Engagement", kind="bar")
         print("Engagements per Category:")
```

```
Engagements per Category:
```



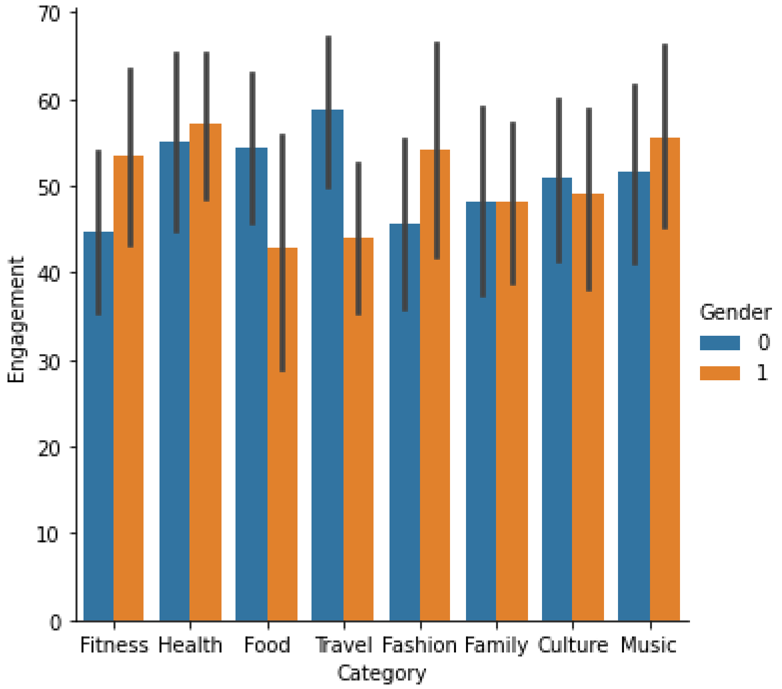
```
In [28]: sns.catplot(data=SM, x="Category", y="Engagement", hue="Post Type", kind="b
         ar")
         print("Engagements per Post Types in each Category:")
```

```
Engagements per Post Types in each Category:
```



```
In [29]: sns.catplot(data=SM, x="Category", y="Engagement", hue="Gender", kind="ba
         r")
```

```
Out[29]: <seaborn.axisgrid.FacetGrid at 0x7fd5f4665490>
```


Engagement
Fitness
Health
Food
Travel
Fashion
Family
Culture
Music
Category
Gender