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

```
data = pd.read_csv('googleplaystore.csv')
```

```
data.head()
```

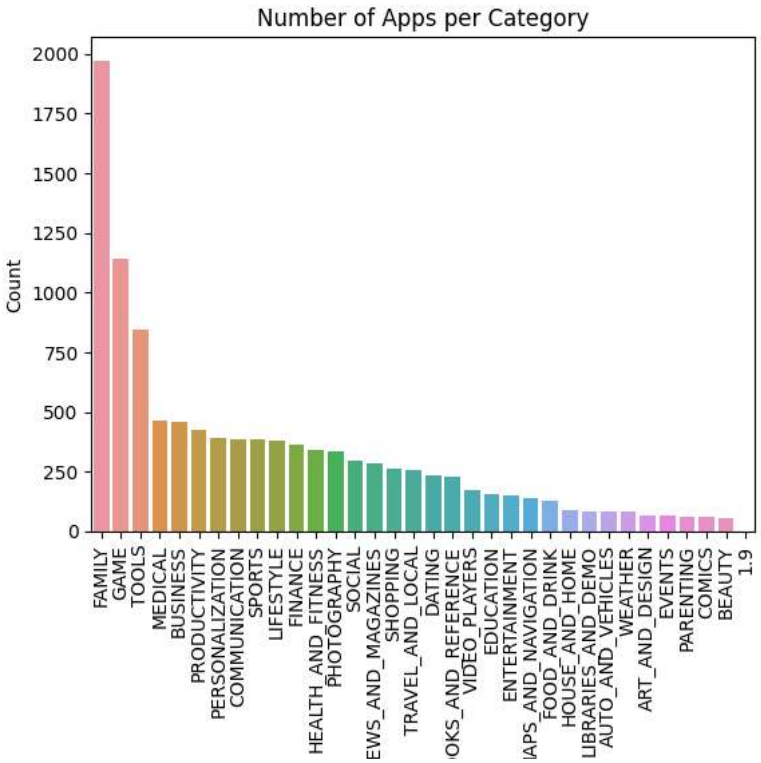
	App	Category	Rating	Reviews	Size	Installs	Type	Price	Content Rating
0	Photo Editor & Candy Camera & Grid & ScrapBook	ART_AND_DESIGN	4.1	159	19M	10,000+	Free	0	Everyone
1	Coloring book moana	ART_AND_DESIGN	3.9	967	14M	500,000+	Free	0	Everyone
2	U Launcher Lite – FREE Live Cool Themes, Hide ...	ART_AND_DESIGN	4.7	87510	8.7M	5,000,000+	Free	0	Everyone
3	Sketch - Draw &	ART_AND_DESIGN	4.5	215644	25M	50,000,000+	Free	0	Teen

```
data.describe()
data.info()
```

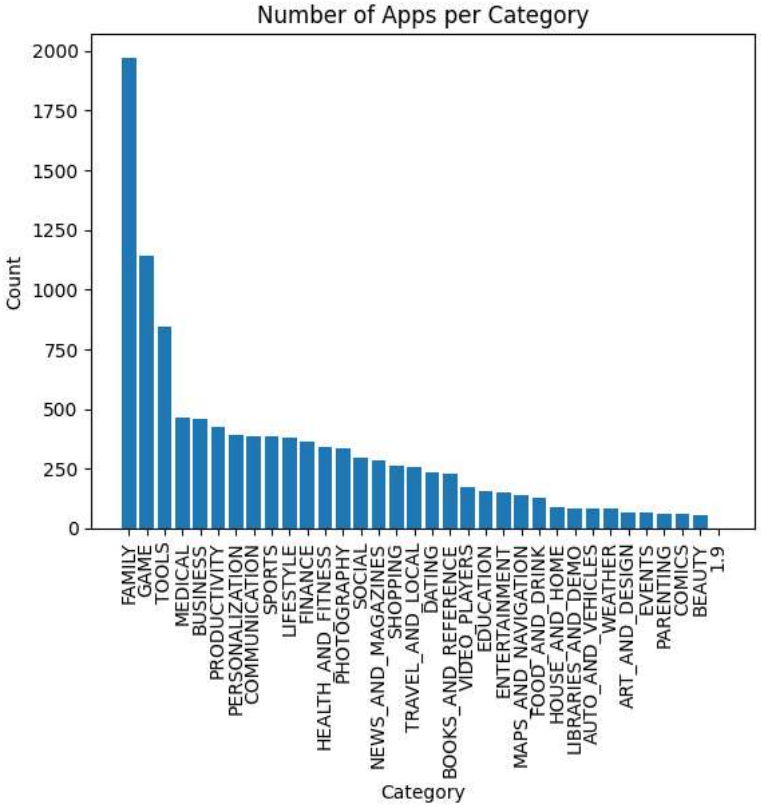
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10841 entries, 0 to 10840
Data columns (total 13 columns):
 #   Column          Non-Null Count  Dtype  
---  ------          --------------  -----  
 0   App             10841 non-null  object 
 1   Category        10841 non-null  object 
 2   Rating          9367 non-null   float64
 3   Reviews         10841 non-null  object 
 4   Size            10841 non-null  object 
 5   Installs        10841 non-null  object 
 6   Type            10840 non-null  object 
 7   Price           10841 non-null  object 
 8   Content Rating  10840 non-null  object 
 9   Genres          10841 non-null  object 
 10  Last Updated    10841 non-null  object 
 11  Current Ver     10833 non-null  object 
 12  Android Ver     10838 non-null  object 
dtypes: float64(1), object(12)
memory usage: 1.1+ MB
```

```
# Apps category wise
category = data['Category'].value_counts()
```

```
sns.barplot(x=category.index, y=category.values)
plt.xlabel('Category')
plt.ylabel('Count')
plt.title('Number of Apps per Category')
plt.xticks(rotation=90)
plt.show()
```

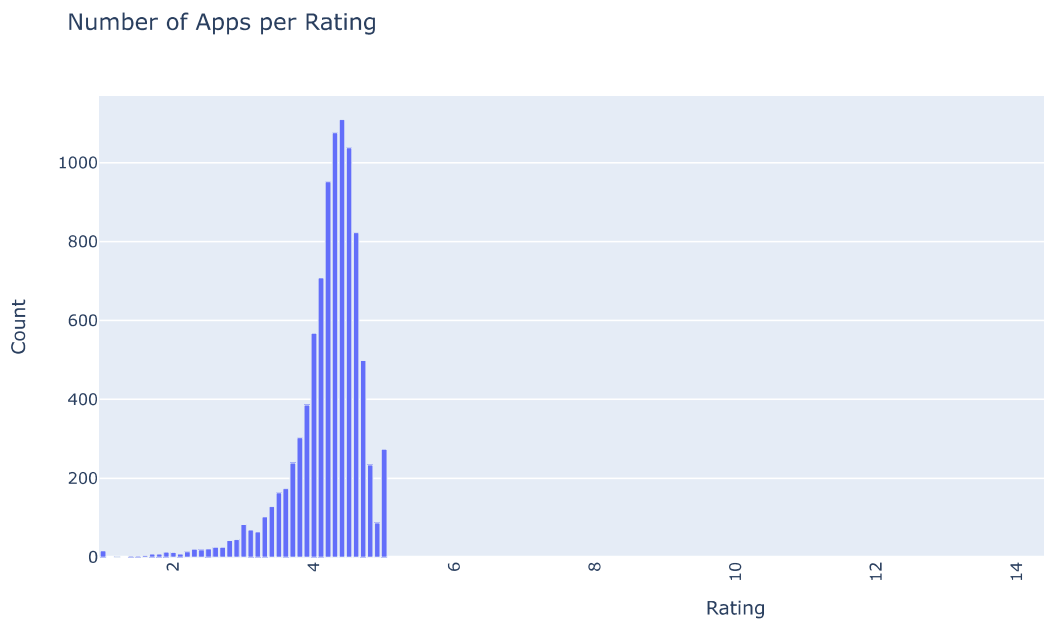



```
plt.bar(category.index, category.values)
plt.xlabel('Category')
plt.ylabel('Count')
plt.title('Number of Apps per Category')
plt.xticks(rotation=90)
plt.show()
```

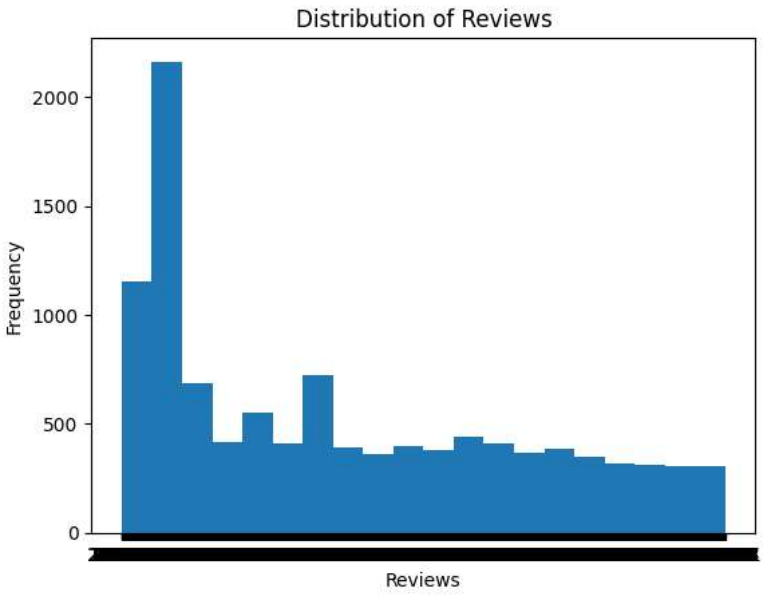



```
import plotly.graph_objects as go

rating = data['Rating'].value_counts()
```

```
fig = go.Figure(data=[
    go.Bar(x=rating.index, y=rating.values)
])

fig.update_layout(
    xaxis=dict(title='Rating'),
    yaxis=dict(title='Count'),
    title='Number of Apps per Rating',
    xaxis_tickangle=-90
)

fig.show()
```



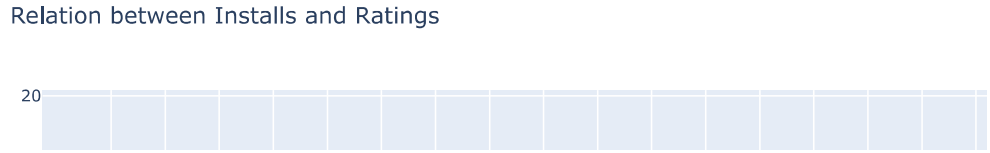

```
plt.hist(data['Reviews'], bins=20)
plt.xlabel('Reviews')
plt.ylabel('Frequency')
plt.title('Distribution of Reviews')
plt.show()
```



```
print(data['Category'].value_counts())
```

```
FAMILY                1972
GAME                  1144
TOOLS                  843
MEDICAL                463
BUSINESS               460
PRODUCTIVITY           424
PERSONALIZATION        392
COMMUNICATION          387
SPORTS                 384
LIFESTYLE              382
FINANCE                366
HEALTH_AND_FITNESS     341
PHOTOGRAPHY            335
SOCIAL                 295
NEWS_AND_MAGAZINES     283
SHOPPING               260
TRAVEL_AND_LOCAL       258
DATING                 234
BOOKS_AND_REFERENCE    231
VIDEO_PLAYERS          175
EDUCATION              156
ENTERTAINMENT          149
MAPS_AND_NAVIGATION    137
FOOD_AND_DRINK         127
HOUSE_AND_HOME          88
LIBRARIES_AND_DEMO      85
AUTO_AND_VEHICLES       85
WEATHER                 82
ART_AND_DESIGN          65
EVENTS                  64
PARENTING               60
COMICS                  60
BEAUTY                  53
1.9                      1
Name: Category, dtype: int64
```

```
import plotly.graph_objects as go
import seaborn as sns

sns.set(style='whitegrid')

fig = go.Figure(data=go.Scatter(
    x=data['Installs'],
    y=data['Rating'],
    mode='markers'
))

fig.update_layout(
    xaxis=dict(title='Number of Installs'),
    yaxis=dict(title='Rating'),
    title='Relation between Installs and Ratings'
)

fig.show()
```




```
#Realation between category and ratings
relation =data.groupby('Category')['Rating'].mean().sort_values(ascending=False)
print('High Rates App Categories')
print(relation)
```

```
High Rates App Categories
Category
1.9                    19.000000
EVENTS                  4.435556
EDUCATION               4.389032
ART_AND_DESIGN          4.358065
BOOKS_AND_REFERENCE     4.346067
PERSONALIZATION         4.335987
PARENTING               4.300000
GAME                    4.286326
BEAUTY                  4.278571
HEALTH_AND_FITNESS      4.277104
SHOPPING                4.259664
SOCIAL                  4.255598
WEATHER                 4.244000
SPORTS                  4.223511
PRODUCTIVITY            4.211396
HOUSE_AND_HOME          4.197368
FAMILY                  4.192272
PHOTOGRAPHY             4.192114
AUTO_AND_VEHICLES       4.190411
MEDICAL                 4.189143
LIBRARIES_AND_DEMO      4.178462
FOOD_AND_DRINK          4.166972
COMMUNICATION           4.158537
COMICS                  4.155172
NEWS_AND_MAGAZINES      4.132189
FINANCE                 4.131889
ENTERTAINMENT           4.126174
BUSINESS                4.121452
TRAVEL_AND_LOCAL        4.109292
LIFESTYLE               4.094904
VIDEO_PLAYERS           4.063750
MAPS_AND_NAVIGATION     4.051613
TOOLS                   4.047411
DATING                  3.970769
Name: Rating, dtype: float64
```

```
data['Rating'].describe()
```

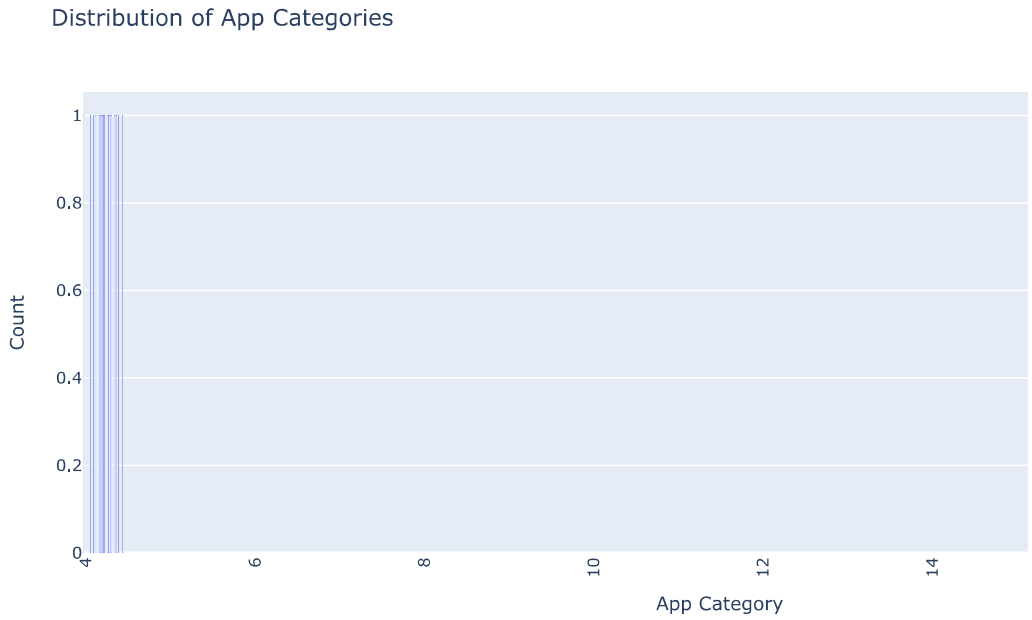
```
count    9367.000000
mean        4.193338
std         0.537431
min         1.000000
25%         4.000000
50%         4.300000
75%         4.500000
max        19.000000
Name: Rating, dtype: float64
```

```
data['Reviews'].describe()
```

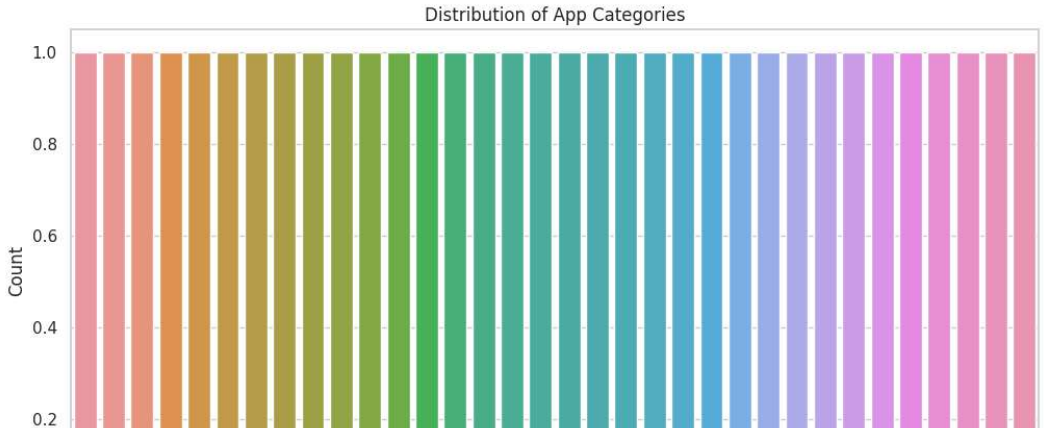
```
count     10841
unique     6002
top           0
freq        596
Name: Reviews, dtype: object
```

```
category_counts = relation.value_counts()
```

```
import plotly.graph_objects as go

fig = go.Figure(data=[
    go.Bar(x=category_counts.index, y=category_counts.values)
])

fig.update_layout(
    xaxis=dict(title='App Category'),
    yaxis=dict(title='Count'),
    title='Distribution of App Categories',
    xaxis_tickangle=-90
)

fig.show()
```




```
plt.figure(figsize=(12, 6))
sns.barplot(x=category_counts.index, y=category_counts.values)
plt.xlabel('App Category')
plt.ylabel('Count')
plt.title('Distribution of App Categories')
plt.xticks(rotation=90)
plt.show()
```




```
data.dropna()
data.drop_duplicates()
data.describe()
```

	Rating
count	9367.000000
mean	4.193338
std	0.537431
min	1.000000
25%	4.000000
50%	4.300000
75%	4.500000
max	19.000000

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