

A1 Bar Chart Examples

```
In [1]: import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

Palette

For uniformity in hand-drawing and barcharts, I have selected a colour-palette that resembles the pens that I have purchased for this endeavor

```
In [2]: # Define palette for grouped bar charts
grouped_palette = [
    '#1f77b4', # Blue
    '#ff7f0e', # Orange
    '#2ca02c', # Green
    '#d62728', # Red
    '#9467bd', # Purple
    '#555555', # Grey
    '#e377c2', # Pink
    '#2495C4', # Light Blue
]

# Visualise the palette

plt.figure(figsize=(10, 1))
plt.bar(range(len(grouped_palette)), [1]*len(grouped_palette), color=grouped_palette)
# Add Labels to the bars
for i, color in enumerate(grouped_palette):
    plt.text(i, 0.5, color, ha='center', va='center', fontsize=10)
# Remove the y-axis labels
plt.yticks([])
# Remove the x-axis labels
plt.xticks([])
# Remove the plot outline
plt.gca().spines['top'].set_visible(False)
plt.gca().spines['right'].set_visible(False)
plt.gca().spines['bottom'].set_visible(False)
plt.gca().spines['left'].set_visible(False)
plt.show()
```



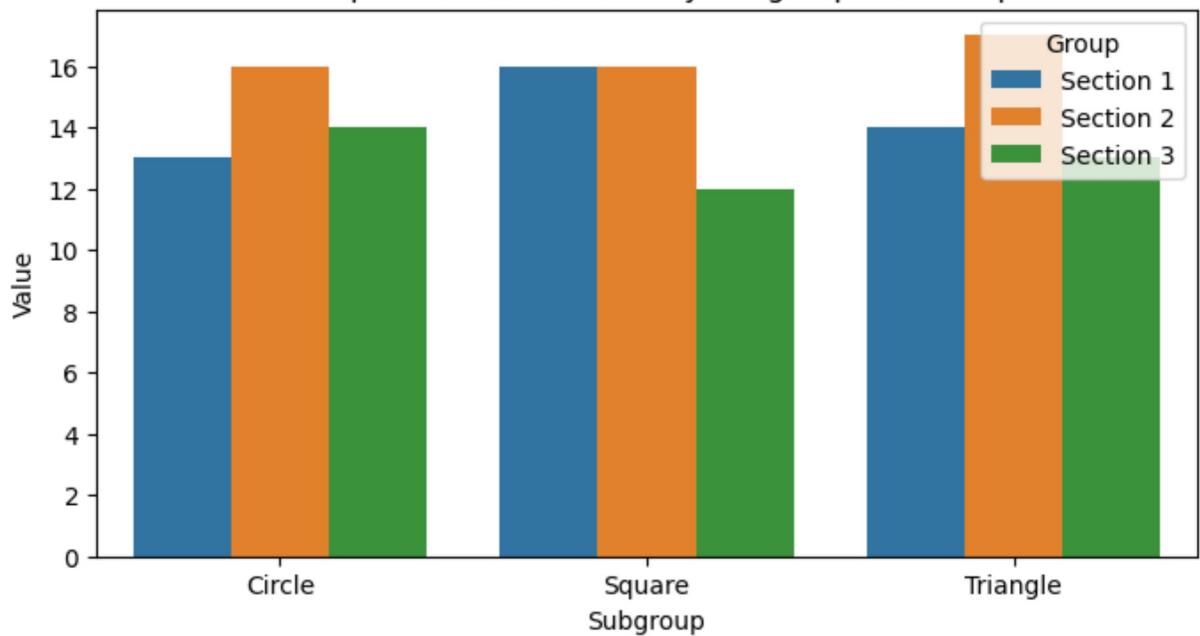
016 Grouped

```
In [3]: # 1. Simple Bar Chart Example  
bc_016_grouped = pd.read_csv('./bar_charts/bar_grouped_016.csv')  
  
bc_016_grouped
```

```
Out[3]:   Group  Subgroup  Value  
0  Section 1    Circle     13  
1  Section 1   Square     16  
2  Section 1  Triangle    14  
3  Section 2    Circle     16  
4  Section 2   Square     16  
5  Section 2  Triangle    17  
6  Section 3    Circle     14  
7  Section 3   Square     12  
8  Section 3  Triangle    13
```

```
In [35]: plt.figure(figsize=(8, 4))  
sns.barplot(  
    data=bc_016_grouped,  
    x='Subgroup',  
    y='Value',  
    hue='Group',  
    palette=grouped_palette[:3]  
)  
plt.xlabel('Subgroup')  
plt.ylabel('Value')  
plt.title('Grouped Bar Chart: Value by Subgroup and Group')  
plt.legend(title='Group')  
plt.show()
```

Grouped Bar Chart: Value by Subgroup and Group



017 Grouped

```
In [36]: ## 002  
bc_017_grouped = pd.read_csv('./bar_charts/bar_grouped_017.csv')  
bc_017_grouped
```

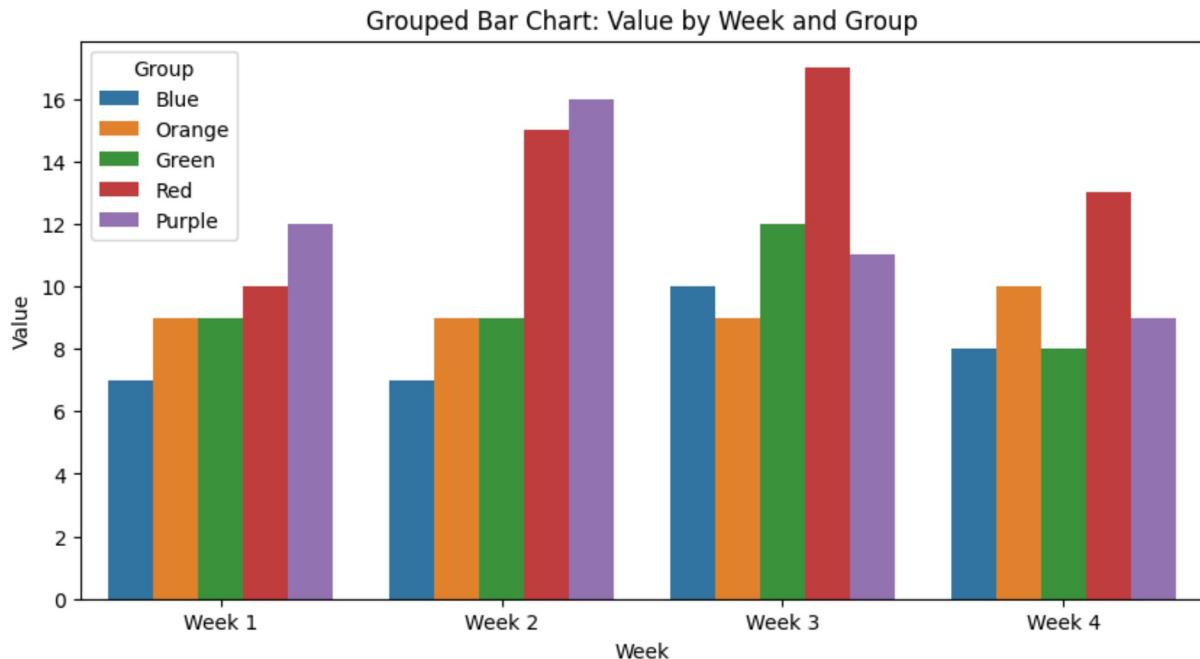
Out[36]:

	Group	Subgroup	Value
0	Blue	Week 1	7
1	Blue	Week 2	7
2	Blue	Week 3	10
3	Blue	Week 4	8
4	Orange	Week 1	9
5	Orange	Week 2	9
6	Orange	Week 3	9
7	Orange	Week 4	10
8	Green	Week 1	9
9	Green	Week 2	9
10	Green	Week 3	12
11	Green	Week 4	8
12	Red	Week 1	10
13	Red	Week 2	15
14	Red	Week 3	17
15	Red	Week 4	13
16	Purple	Week 1	12
17	Purple	Week 2	16
18	Purple	Week 3	11
19	Purple	Week 4	9

In [6]:

```
# Plot the bar chart
plt.figure(figsize=(10, 5))
import seaborn as sns

sns.barplot(
    data=bc_017_grouped,
    x='Subgroup',
    y='Value',
    hue='Group'
)
plt.xlabel('Week')
plt.ylabel('Value')
plt.title('Grouped Bar Chart: Value by Week and Group')
plt.legend(title='Group')
plt.show()
```



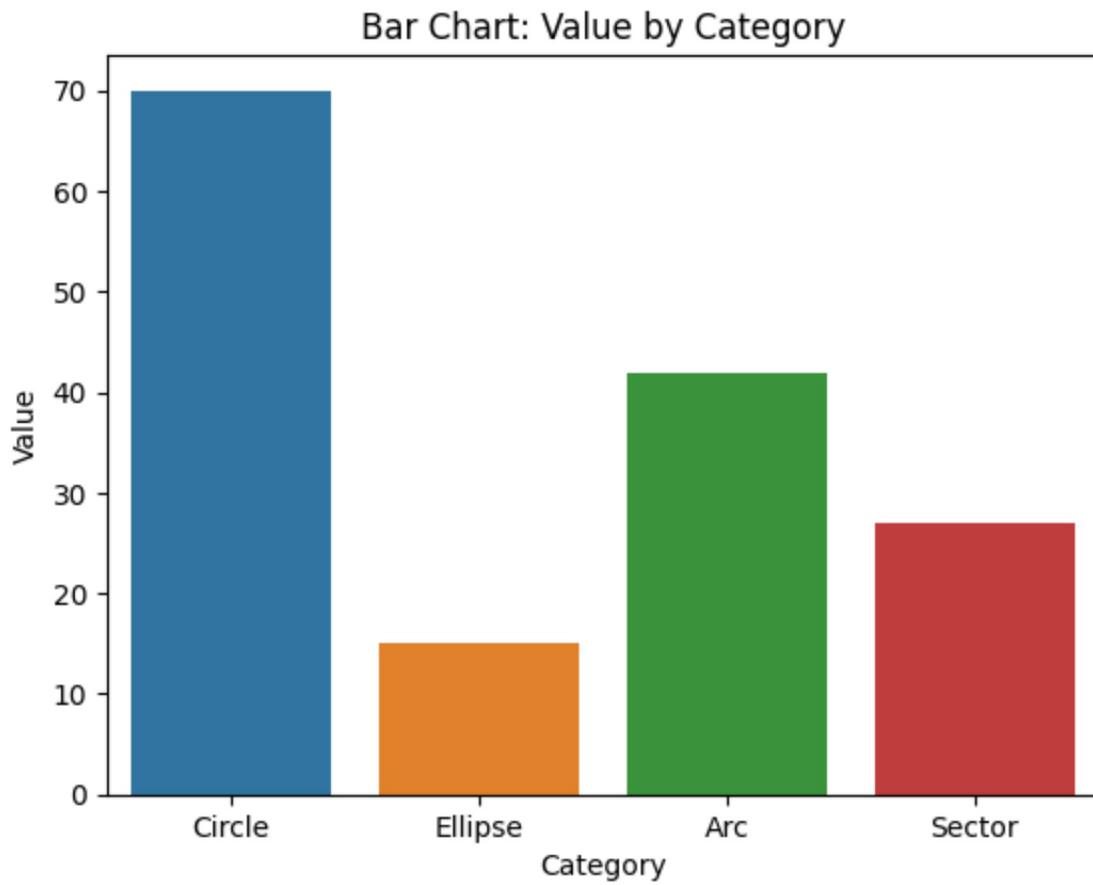
001 Single

```
In [7]: bc_001_single = pd.read_csv('./bar_charts/bar_single_001.csv')

bc_001_single
```

```
Out[7]:   Category  Value
0      Circle    70
1     Ellipse    15
2       Arc     42
3     Sector    27
```

```
In [8]: sns.barplot(
    data=bc_001_single,
    x='Category',
    hue='Category',
    y='Value',
    palette=grouped_palette[:len(bc_001_single)])
)
plt.xlabel('Category')
plt.ylabel('Value')
plt.title('Bar Chart: Value by Category')
plt.show()
```



002 Single

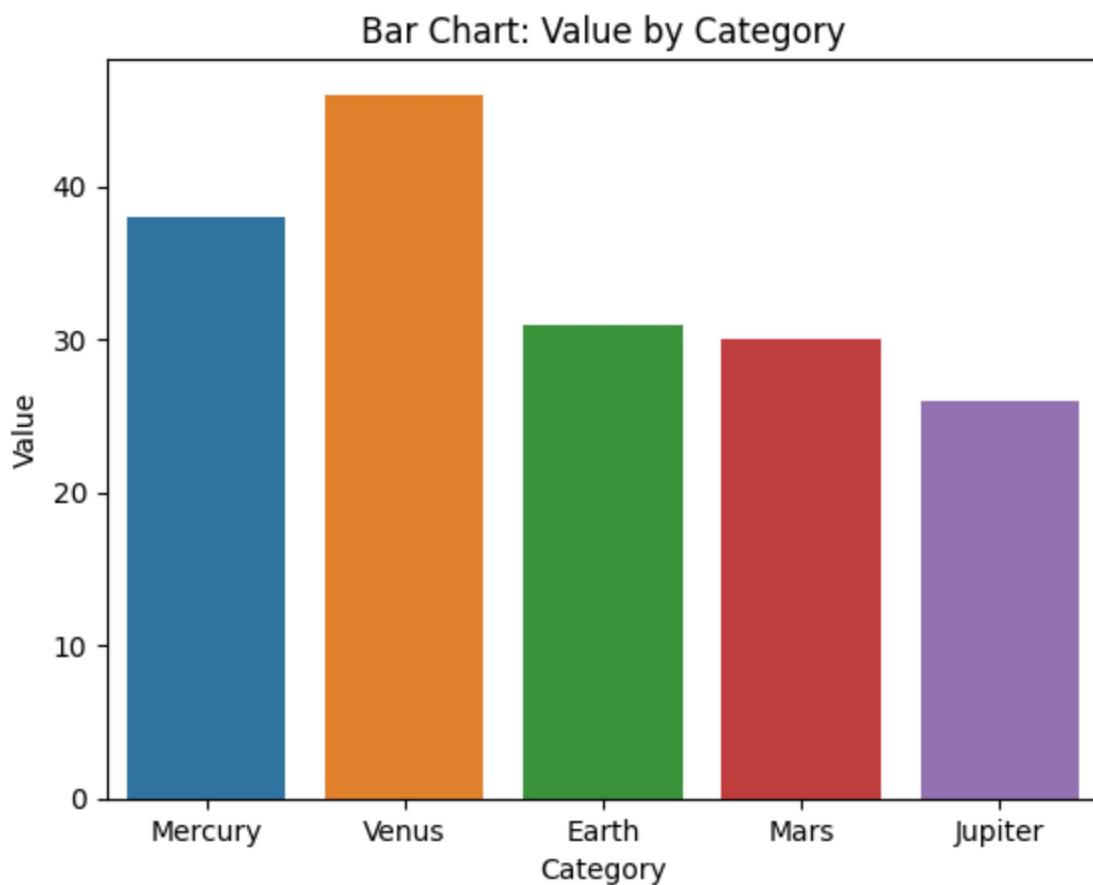
```
In [9]: bc_002_single = pd.read_csv('./bar_charts/bar_single_002.csv')  
bc_002_single
```

```
Out[9]:   Category  Value  
0    Mercury    38  
1     Venus    46  
2     Earth    31  
3     Mars    30  
4    Jupiter    26
```

```
In [10]: sns.barplot(  
                 data=bc_002_single,  
                 x='Category',  
                 hue='Category',  
                 y='Value',  
                 palette=grouped_palette[:len(bc_002_single)]  
)  
plt.xlabel('Category')  
plt.ylabel('Value')
```

```
plt.title('Bar Chart: Value by Category')

Out[10]: Text(0.5, 1.0, 'Bar Chart: Value by Category')
```



003 Single

```
In [11]: bc_003_single = pd.read_csv('./bar_charts/bar_single_003.csv')

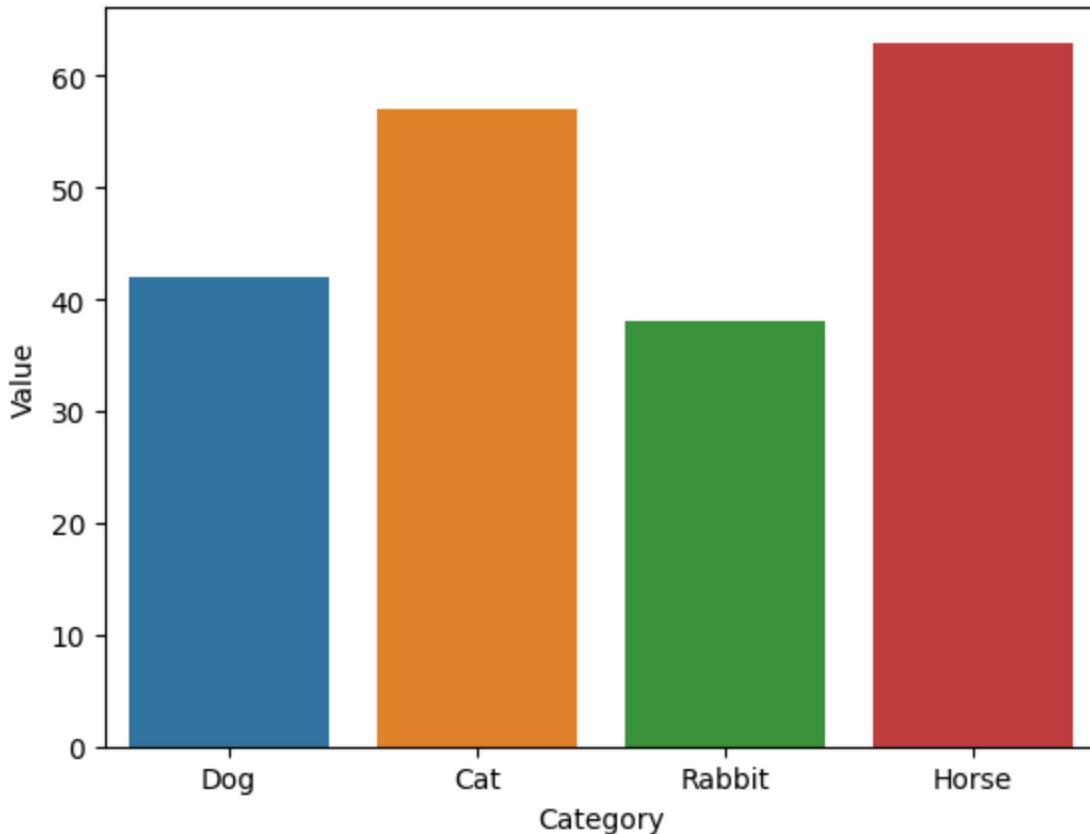
bc_003_single
```

```
Out[11]:   Category  Value
0        Dog     42
1       Cat     57
2    Rabbit     38
3     Horse     63
```

```
In [12]: sns.barplot(
            data=bc_003_single,
            x='Category',
            hue='Category',
            y='Value',
            palette=grouped_palette[:len(bc_003_single)])
)
```

```
plt.xlabel('Category')
plt.ylabel('Value')
```

Out[12]: Text(0, 0.5, 'Value')



004 Single

```
In [13]: bc_004_single = pd.read_csv('./bar_charts/bar_single_004.csv')

bc_004_single
```

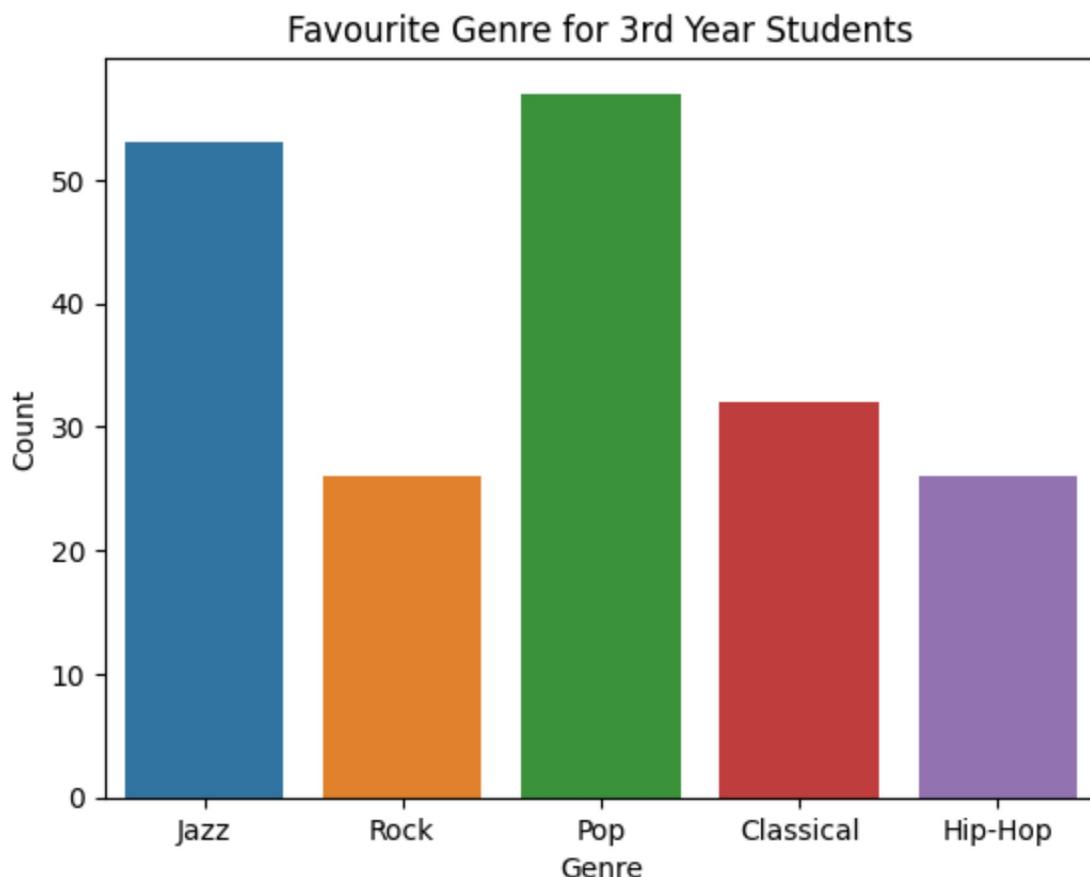
Out[13]:

	Genre	Count
0	Jazz	53
1	Rock	26
2	Pop	57
3	Classical	32
4	Hip-Hop	26

```
In [14]: sns.barplot(
    data=bc_004_single,
    x='Genre',
    hue='Genre',
    y='Count',
    palette=grouped_palette[:len(bc_004_single)])
```

```
)  
plt.xlabel('Genre')  
plt.ylabel('Count')  
plt.title('Favourite Genre for 3rd Year Students')
```

Out[14]: Text(0.5, 1.0, 'Favourite Genre for 3rd Year Students')



028 Grouped

In [15]: bc_028_grouped = pd.read_csv('./bar_charts/bar_grouped_028.csv')

```
bc_028_grouped
```

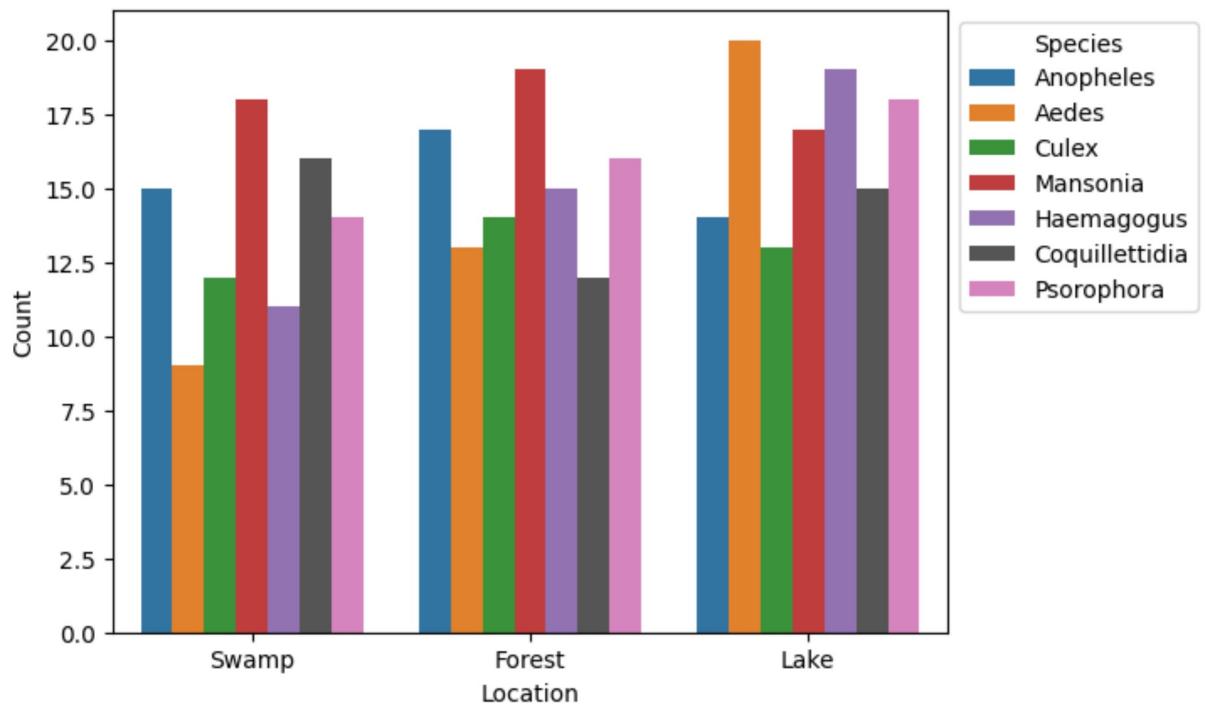
Out[15]:

	Location	Species	Count
0	Swamp	Anopheles	15
1	Swamp	Aedes	9
2	Swamp	Culex	12
3	Swamp	Mansonia	18
4	Swamp	Haemagogus	11
5	Swamp	Coquillettidia	16
6	Swamp	Psorophora	14
7	Forest	Anopheles	17
8	Forest	Aedes	13
9	Forest	Culex	14
10	Forest	Mansonia	19
11	Forest	Haemagogus	15
12	Forest	Coquillettidia	12
13	Forest	Psorophora	16
14	Lake	Anopheles	14
15	Lake	Aedes	20
16	Lake	Culex	13
17	Lake	Mansonia	17
18	Lake	Haemagogus	19
19	Lake	Coquillettidia	15
20	Lake	Psorophora	18

In [16]:

```
sns.barplot(
    data=bc_028_grouped,
    x='Location',
    y='Count',
    hue='Species',
    palette=grouped_palette[:bc_028_grouped['Species'].nunique()] # Set palette size
)
plt.xlabel('Location')
plt.legend(loc='upper left', bbox_to_anchor=(1, 1), title='Species') # Fix the legend position
```

Out[16]: <matplotlib.legend.Legend at 0x203595b3d90>



029 Grouped

```
In [17]: bc_029_grouped = pd.read_csv('./bar_charts/bar_grouped_029.csv')  
bc_029_grouped
```

Out[17]:

	Location	SockType	Count
0	Laundry	Striped	27
1	Laundry	PolkaDot	18
2	Laundry	Argyle	15
3	Laundry	ToeSocks	12
4	Laundry	Novelty	25
5	Laundry	Ankle	20
6	Laundry	KneeHigh	16
7	Laundry	NoShow	19
8	Drawer	Striped	17
9	Drawer	PolkaDot	21
10	Drawer	Argyle	14
11	Drawer	ToeSocks	13
12	Drawer	Novelty	24
13	Drawer	Ankle	18
14	Drawer	KneeHigh	17
15	Drawer	NoShow	22
16	UnderBed	Striped	19
17	UnderBed	PolkaDot	16
18	UnderBed	Argyle	18
19	UnderBed	ToeSocks	11
20	UnderBed	Novelty	26
21	UnderBed	Ankle	17
22	UnderBed	KneeHigh	14
23	UnderBed	NoShow	21

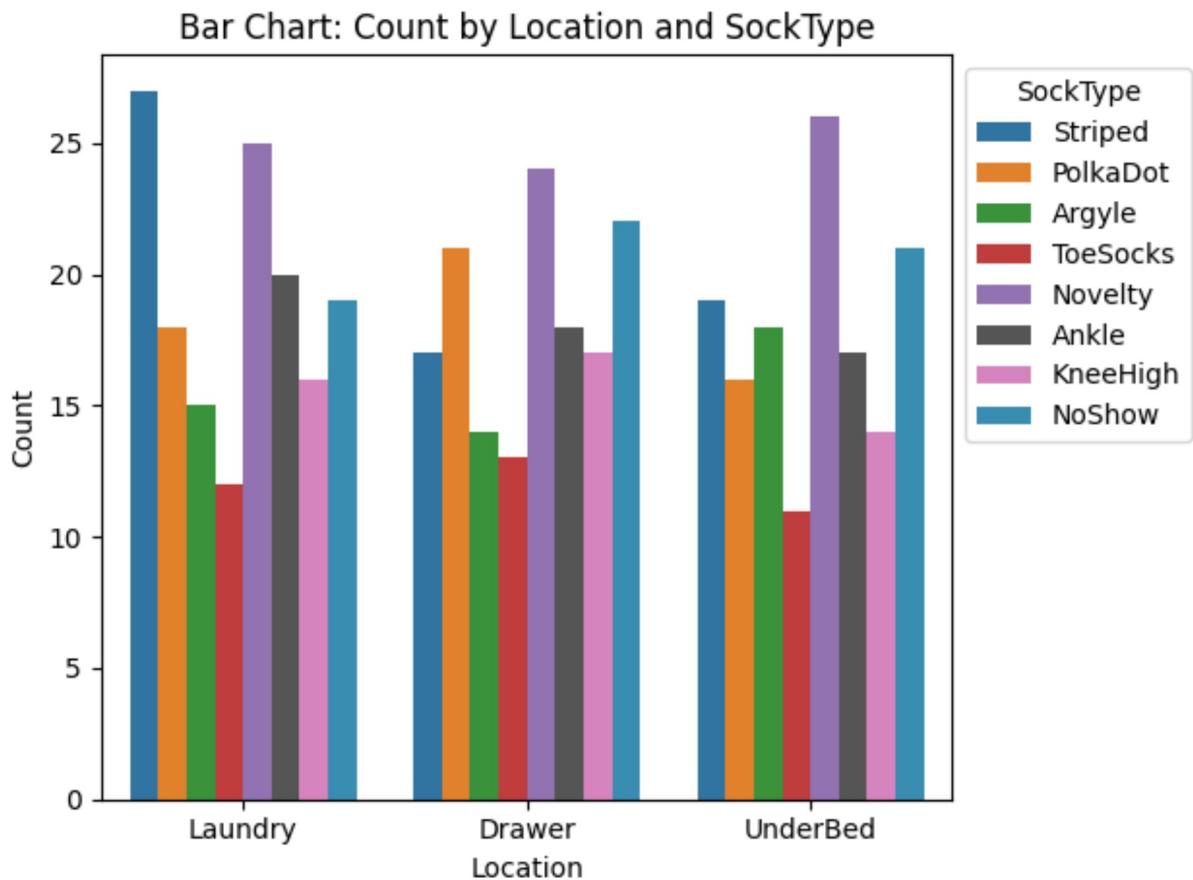
In [18]:

```
sns.barplot(  
    data=bc_029_grouped,  
    x='Location',  
    y='Count',  
    hue='SockType',  
    palette=grouped_palette # Apply palette to the hue groups  
)  
plt.xlabel('Location')  
plt.ylabel('Count')  
plt.title('Bar Chart: Count by Location and SockType')
```

```

plt.legend(
    title='SockType',
    bbox_to_anchor=(1, 1),
    loc='upper left'
)
plt.tight_layout()
plt.show()

```



005 Single

```
In [19]: bc_005_single = pd.read_csv('./bar_charts/bar_single_005.csv')

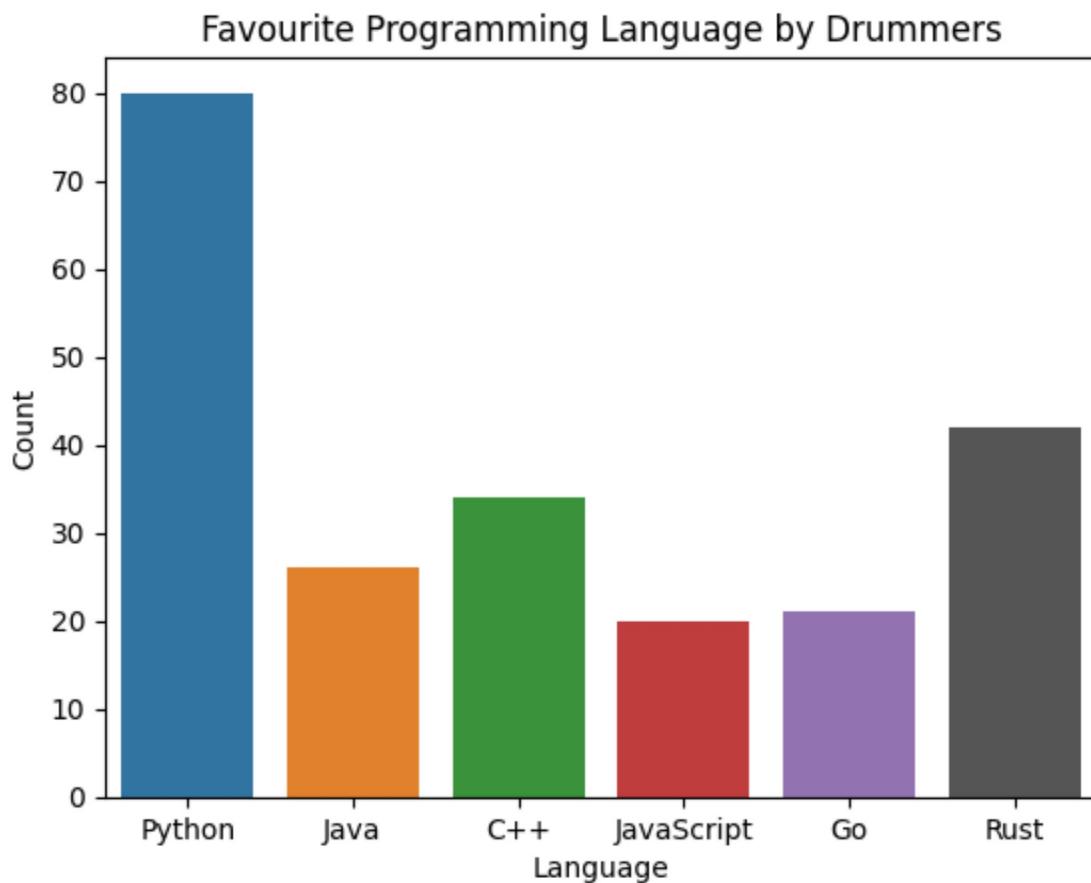
bc_005_single
```

Out[19]: **Language Count**

0	Python	80
1	Java	26
2	C++	34
3	JavaScript	20
4	Go	21
5	Rust	42

```
In [20]: sns.barplot(  
    data=bc_005_single,  
    x='Language',  
    hue='Language',  
    y='Count',  
    palette=grouped_palette[:len(bc_005_single)]  
)  
plt.xlabel('Language')  
plt.title('Favourite Programming Language by Drummers')
```

```
Out[20]: Text(0.5, 1.0, 'Favourite Programming Language by Drummers')
```



006 Single

```
In [21]: bc_006_single = pd.read_csv('./bar_charts/bar_single_006.csv')  
bc_006_single
```

```
Out[21]:
```

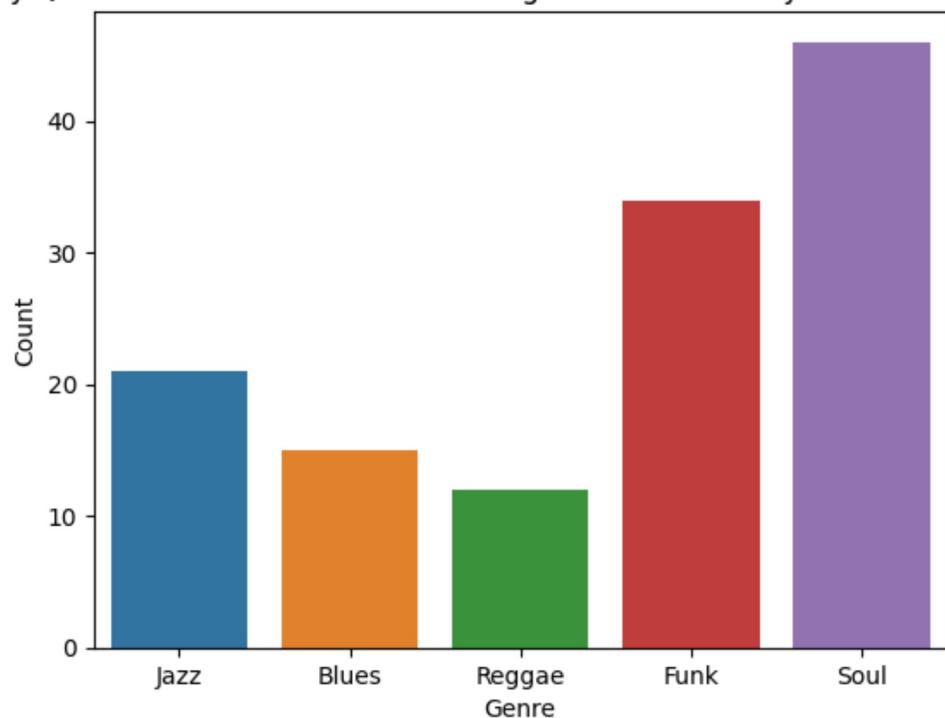
	Genre	Count
0	Jazz	21
1	Blues	15
2	Reggae	12
3	Funk	34
4	Soul	46

```
In [22]:
```

```
sns.barplot(  
    data=bc_006_single,  
    x='Genre',  
    hue='Genre',  
    y='Count',  
    palette=grouped_palette[:len(bc_006_single)]  
)  
plt.xlabel('Genre')  
plt.title('Survey Question of Church-Goers: Which genre is most likely the Devil\\'s  
favourite?')
```

```
Out[22]: Text(0.5, 1.0, "Survey Question of Church-Goers: Which genre is most likely the De  
vil's favourite?")
```

Survey Question of Church-Goers: Which genre is most likely the Devil's favourite?



007 Single

```
In [23]:
```

```
bc_007_single = pd.read_csv("bar_charts/bar_single_007.csv")  
bc_007_single
```

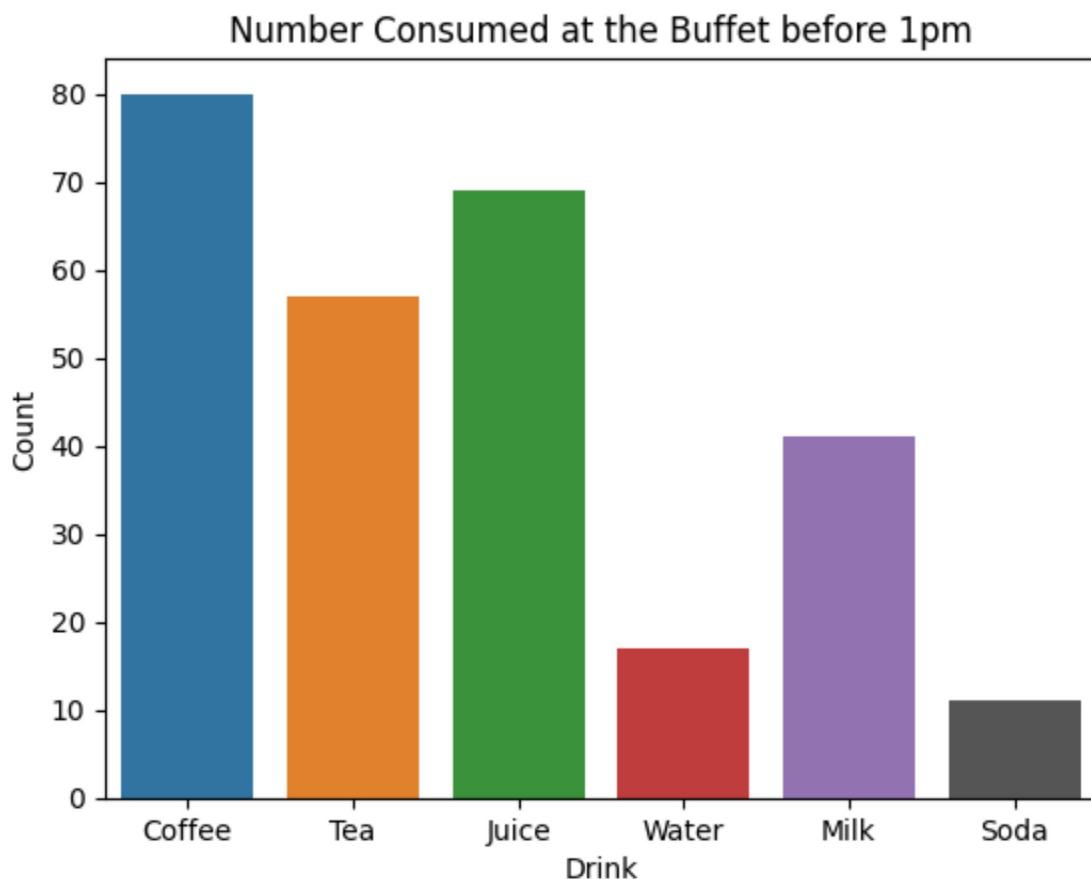
```
Out[23]:
```

	Drink	Count
0	Coffee	80
1	Tea	57
2	Juice	69
3	Water	17
4	Milk	41
5	Soda	11

```
In [24]:
```

```
sns.barplot(  
    data=bc_007_single,  
    x='Drink',  
    hue='Drink',  
    y='Count',  
    palette=grouped_palette[:len(bc_007_single)]  
)  
plt.xlabel('Drink')  
plt.title('Number Consumed at the Buffet before 1pm')
```

```
Out[24]:
```



008 Single

```
In [25]: bc_008_single = pd.read_csv("bar_charts/bar_single_008.csv")
```

```
bc_008_single
```

```
Out[25]:
```

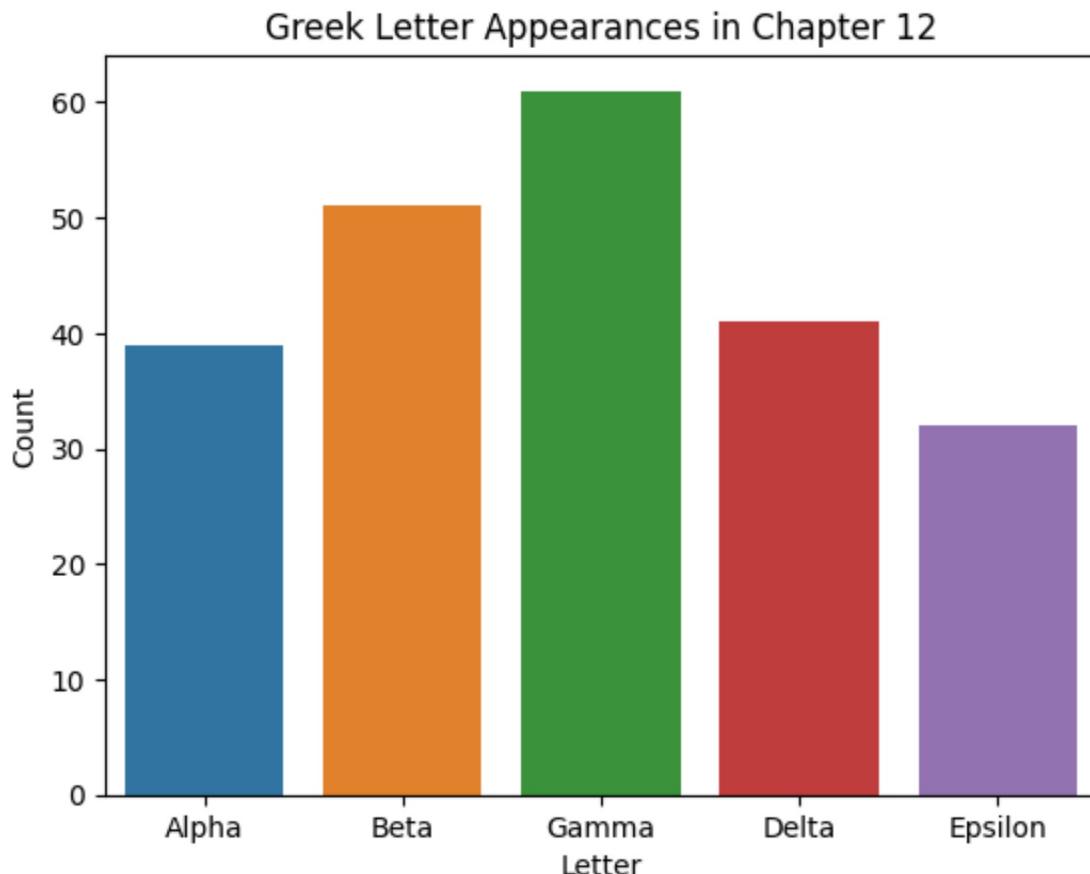
	Letter	Count
0	Alpha	39
1	Beta	51
2	Gamma	61
3	Delta	41
4	Epsilon	32

```
In [33]: sns.barplot(
```

```
    data=bc_008_single,
    x='Letter',
    hue='Letter',
    y='Count',
    palette=grouped_palette[:len(bc_008_single)])
)
```

```
plt.xlabel('Letter')
plt.title('Greek Letter Appearances in Chapter 12')
```

```
Out[33]: Text(0.5, 1.0, 'Greek Letter Appearances in Chapter 12')
```



009 Single

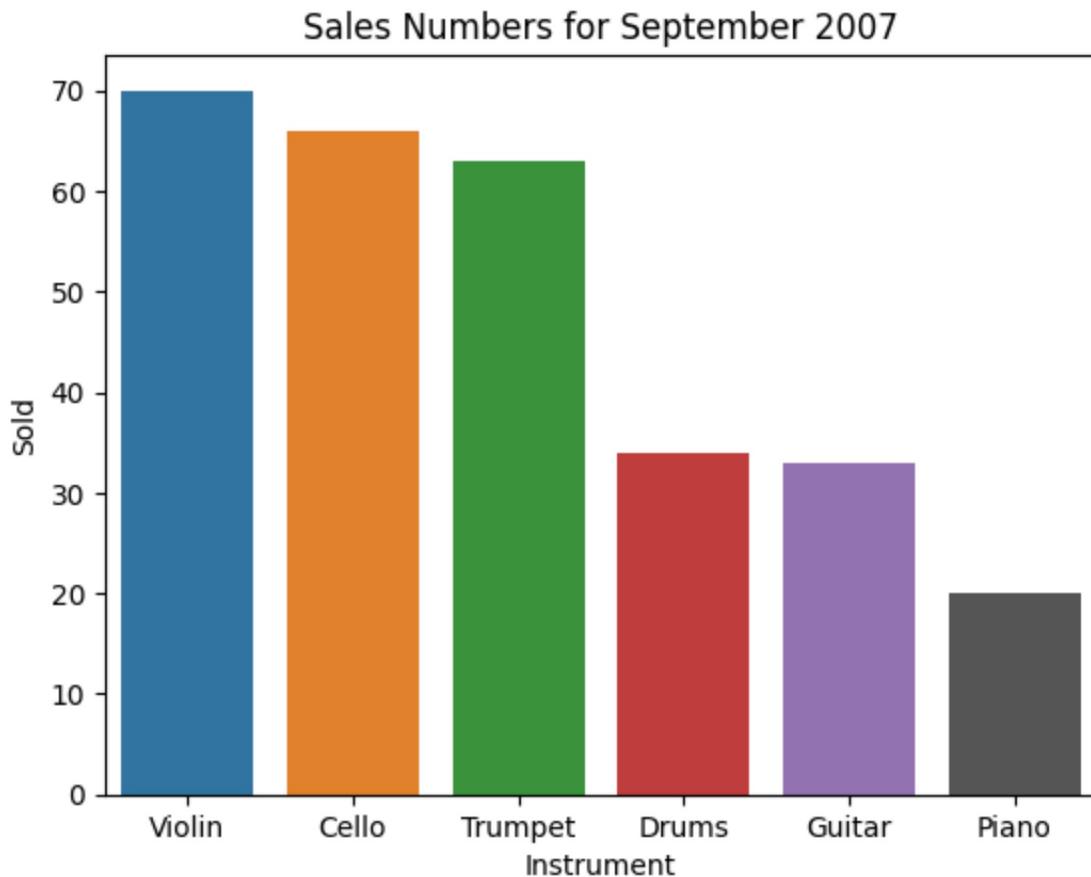
```
In [27]: bc_009_single = pd.read_csv("bar_charts/bar_single_009.csv")  
  
bc_009_single
```

Out[27]:

	Instrument	Sold
0	Violin	70
1	Cello	66
2	Trumpet	63
3	Drums	34
4	Guitar	33
5	Piano	20

```
In [28]: sns.barplot(  
    data=bc_009_single,  
    x='Instrument',  
    hue='Instrument',  
    y='Sold',  
    palette=grouped_palette[:len(bc_009_single)]  
)  
plt.xlabel('Instrument')  
plt.title('Sales Numbers for September 2007')
```

Out[28]: Text(0.5, 1.0, 'Sales Numbers for September 2007')



010 Single

```
In [29]: bc_010_single = pd.read_csv("bar_charts/bar_single_010.csv")  
bc_010_single
```

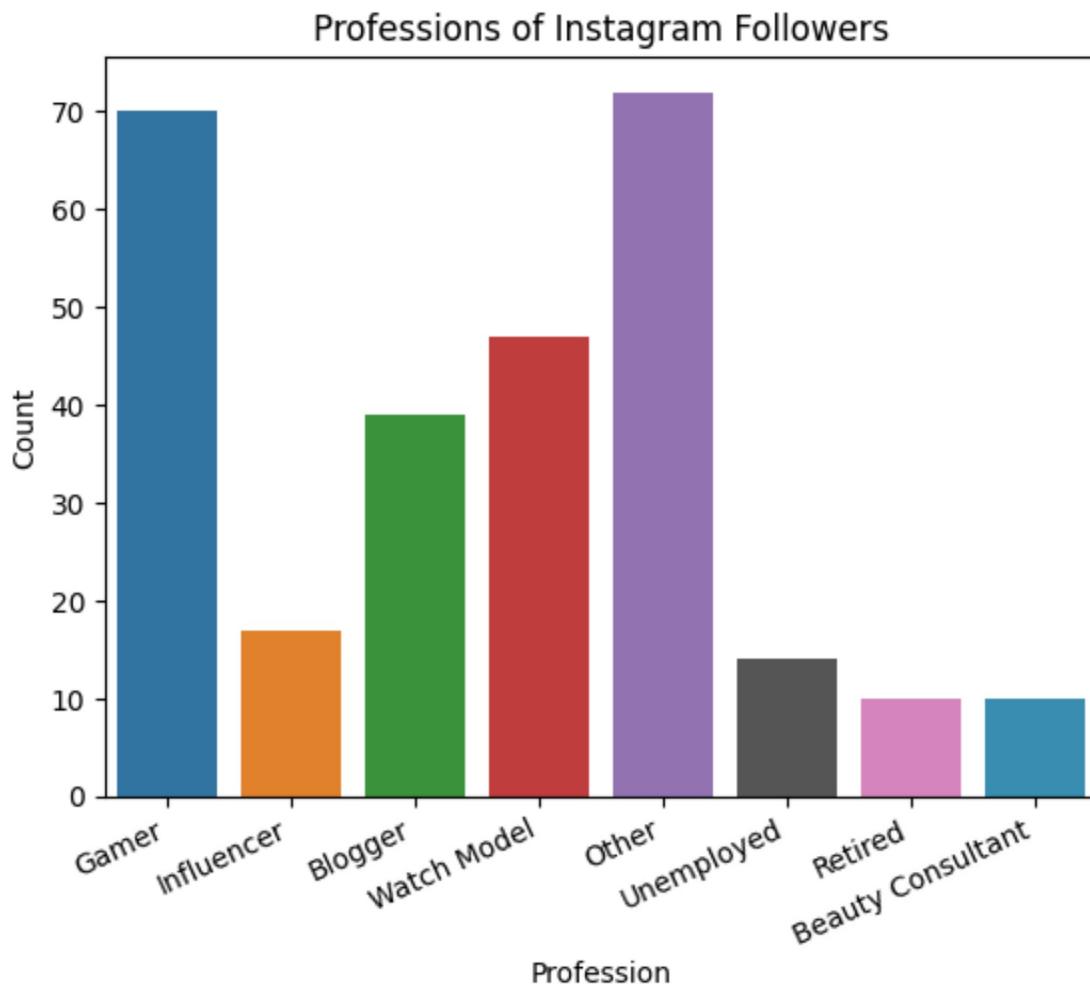
```
Out[29]:
```

	Profession	Count
0	Gamer	70
1	Influencer	17
2	Blogger	39
3	Watch Model	47
4	Other	72
5	Unemployed	14
6	Retired	10
7	Beauty Consultant	10

```
In [30]: sns.barplot(  
    data=bc_010_single,  
    x='Profession',
```

```
        hue='Profession',
        y='Count',
        palette=grouped_palette[:len(bc_010_single)]
    )
plt.xlabel('Profession')
plt.title('Professions of Instagram Followers')
plt.xticks(rotation=25, ha='right')
```

```
Out[30]: ([0, 1, 2, 3, 4, 5, 6, 7],
 [Text(0, 0, 'Gamer'),
  Text(1, 0, 'Influencer'),
  Text(2, 0, 'Blogger'),
  Text(3, 0, 'Watch Model'),
  Text(4, 0, 'Other'),
  Text(5, 0, 'Unemployed'),
  Text(6, 0, 'Retired'),
  Text(7, 0, 'Beauty Consultant')])
```



011

```
In [31]: bc_011_single = pd.read_csv("bar_charts/bar_single_011.csv")
bc_011_single
```

```
Out[31]:
```

	Category	Failures
0	Prototype A	35
1	Prototype B	22
2	Prototype C	21
3	Prototype D	43

011 Single

```
In [32]:
```

```
sns.barplot(  
    data=bc_011_single,  
    x='Category',  
    hue='Category',  
    y='Failures',  
    palette=grouped_palette[:len(bc_011_single)]  
)  
plt.xlabel('Category')  
plt.title('Failures by Prototype')
```

```
Out[32]: Text(0.5, 1.0, 'Failures by Prototype')
```

