Task 3 : Exploratory Data analysis on Dataset 'SampleSuperstore.csv'

GRIP @ The Spark Foundation

This task is about Exploratory Data Analysis-Retail where the main focus is As a Business Manager try to find out weak areas where we can work on for more profits.

Technical Stack : Scikit Learn, Numpy Array, Scipy, Pandas, Matplotlib

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CSV_Data can be read at https://bit.ly/3i4rbWl

In [20]:

```
# Import libraries
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
%matplotlib inline
import warnings
warnings.filterwarnings('ignore')
```

In [21]:

```
# Importing Datasets
data = pd.read_csv('SampleSuperstore.csv')
data.head()
```

Out[21]:

	Ship Mode	Segment	Country	City	State	Postal Code	Region	Category	Sub-Category	Sales	Quantity
0	Second Class	Consumer	United States	Henderson	Kentucky	42420	South	Furniture	Bookcases	261.9600	2
1	Second Class	Consumer	United States	Henderson	Kentucky	42420	South	Furniture	Chairs	731.9400	3
2	Second Class	Corporate	United States	Los Angeles	California	90036	West	Office Supplies	Labels	14.6200	2
3	Standard Class	Consumer	United States	Fort Lauderdale	Florida	33311	South	Furniture	Tables	957.5775	5
4	Standard Class	Consumer	United States	Fort Lauderdale	Florida	33311	South	Office Supplies	Storage	22.3680	2

In [22]:

```
data.describe()
```

Out[22]:

	Postal Code	Sales	Quantity	Discount	Profit
count	9994.000000	9994.000000	9994.000000	9994.000000	9994.000000
mean	55190.379428	229.858001	3.789574	0.156203	28.656896
std	32063.693350	623.245101	2.225110	0.206452	234.260108
min	1040.000000	0.444000	1.000000	0.000000	-6599.978000
25%	23223.000000	17.280000	2.000000	0.000000	1.728750
50%	56430.500000	54.490000	3.000000	0.200000	8.666500
75%	90008.000000	209.940000	5.000000	0.200000	29.364000
max	99301.000000	22638.480000	14.000000	0.800000	8399.976000

In [23]:

```
# States name
data.State.unique()
```

Out[23]:

```
array(['Kentucky', 'California', 'Florida', 'North Carolina',
       'Washington', 'Texas', 'Wisconsin', 'Utah', 'Nebraska',
       'Pennsylvania', 'Illinois', 'Minnesota', 'Michigan', 'Delaware',
       'Indiana', 'New York', 'Arizona', 'Virginia', 'Tennessee',
       'Alabama', 'South Carolina', 'Oregon', 'Colorado', 'Iowa', 'Ohio',
       'Missouri', 'Oklahoma', 'New Mexico', 'Louisiana', 'Connecticut',
       'New Jersey', 'Massachusetts', 'Georgia', 'Nevada', 'Rhode Island',
       'Mississippi', 'Arkansas', 'Montana', 'New Hampshire', 'Maryland',
       'District of Columbia', 'Kansas', 'Vermont', 'Maine',
       'South Dakota', 'Idaho', 'North Dakota', 'Wyoming',
       'West Virginia'], dtype=object)
```

In [24]:

```
# Region name
data.Region.unique()
```

Out[24]:

```
array(['South', 'West', 'Central', 'East'], dtype=object)
```

In [25]:

```
# Shipping mode
data['Ship Mode'].unique()
```

Out[25]:

```
array(['Second Class', 'Standard Class', 'First Class', 'Same Day'],
      dtype=object)
```

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1. Second Class
2. Standard Class
3. First Class
4. Same day

In [26]:

```
data.Category.unique()
```

Out[26]:

```
array(['Furniture', 'Office Supplies', 'Technology'], dtype=object)
```

Three categories of Goods:

1. Furniture
2. Office Supplies
3. Technology

In [27]:

```
data['Sub-Category'].unique()
```

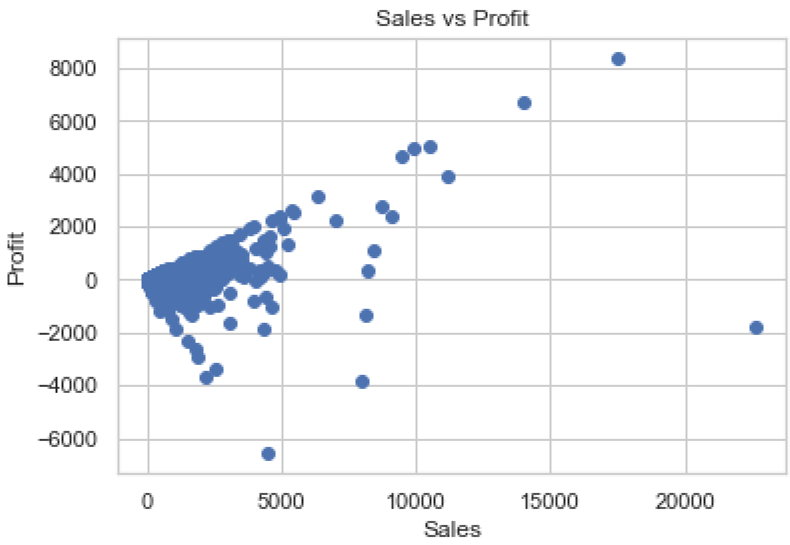
Out[27]:

```
array(['Bookcases', 'Chairs', 'Labels', 'Tables', 'Storage',
       'Furnishings', 'Art', 'Phones', 'Binders', 'Appliances', 'Paper',
       'Accessories', 'Envelopes', 'Fasteners', 'Supplies', 'Machines',
       'Copiers'], dtype=object)
```

In [28]:

```
# Sales VS Profit plot

plt.scatter(data.Sales, data.Profit)
plt.xlabel('Sales')
plt.ylabel('Profit')
plt.title('Sales vs Profit')
plt.show()
```



Let's make a profit vs loss graph. In order to do that we need to make a new column in the dataset.

In [29]:

```
PL = pd.Series([],dtype=pd.StringDtype())
for i in range (len(data)):
    if data['Profit'][i] > 0:
        PL[i] = 'Profit'
    else:
        PL[i] = 'Loss'

data.insert(loc = 11, column = 'PL', value = PL)
```

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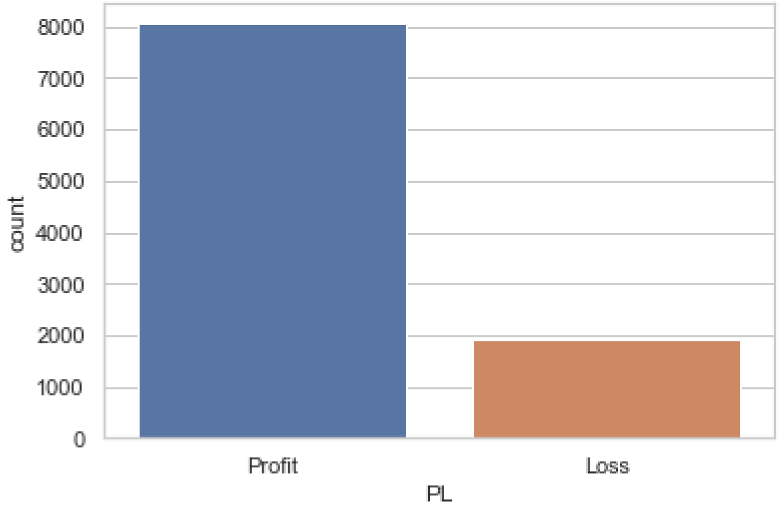
In [30]:

```
sns.countplot('PL', data=data)
```

Out[30]:

```
<AxesSubplot:xlabel='PL', ylabel='count'>
```



Profit-Loss BarPlot from Category

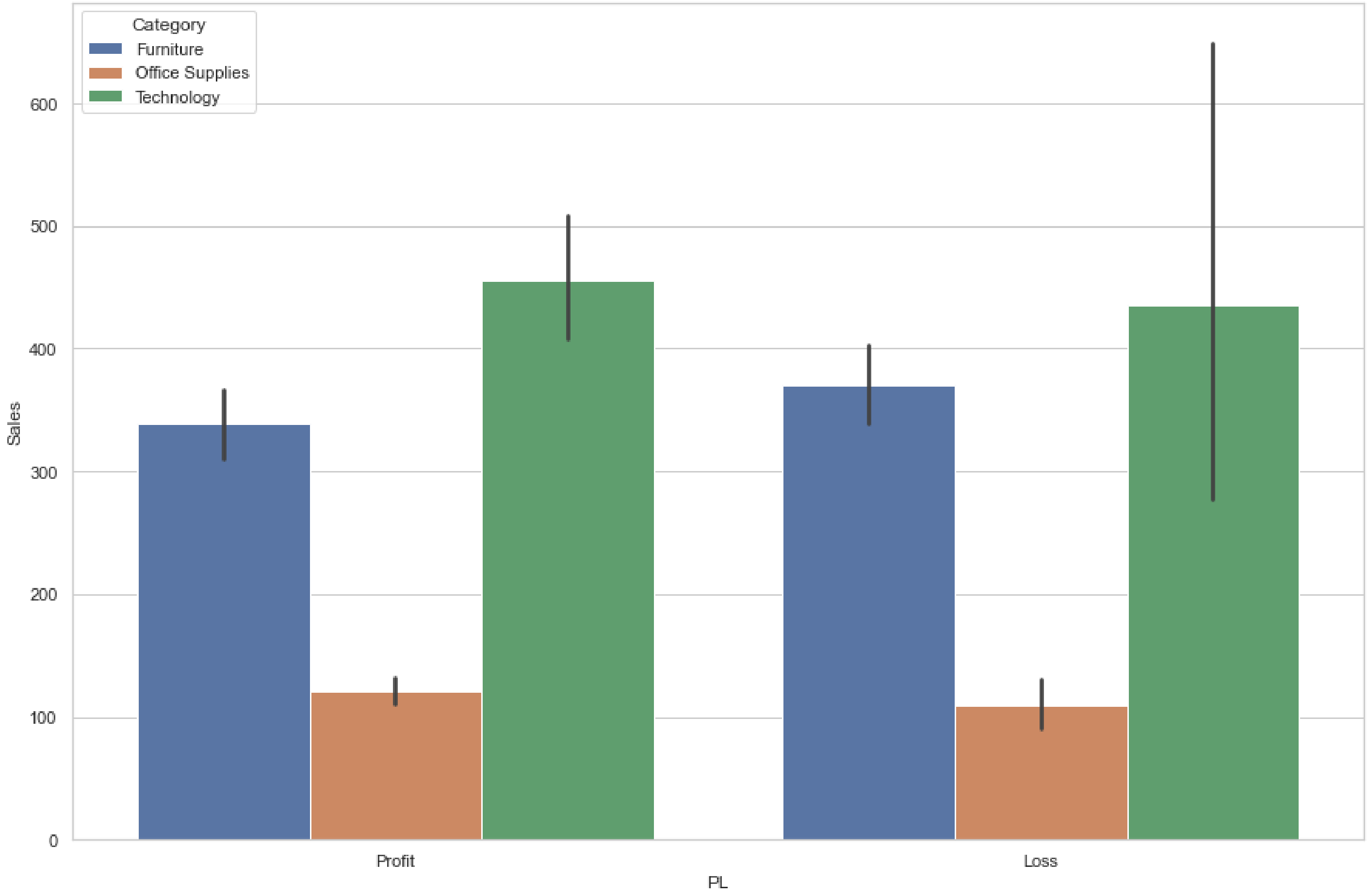
Which categories of product is giving more profit and which categories of product is giving more loss?

In [31]:

```
plt.figure(figsize=(15,10))
sns.barplot(x = 'PL', y = 'Sales', data = data , hue = 'Category')
```

Out[31]:

```
<AxesSubplot:xlabel='PL', ylabel='Sales'>
```



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We can see in above plot , Technology products can give us huge profit as well as huge loss at a times. On the other hand in the office supplies, the profit is lower but the loss is also very low that means the risk of doing business is low. Furniture product have a bit higher loss number than profit.

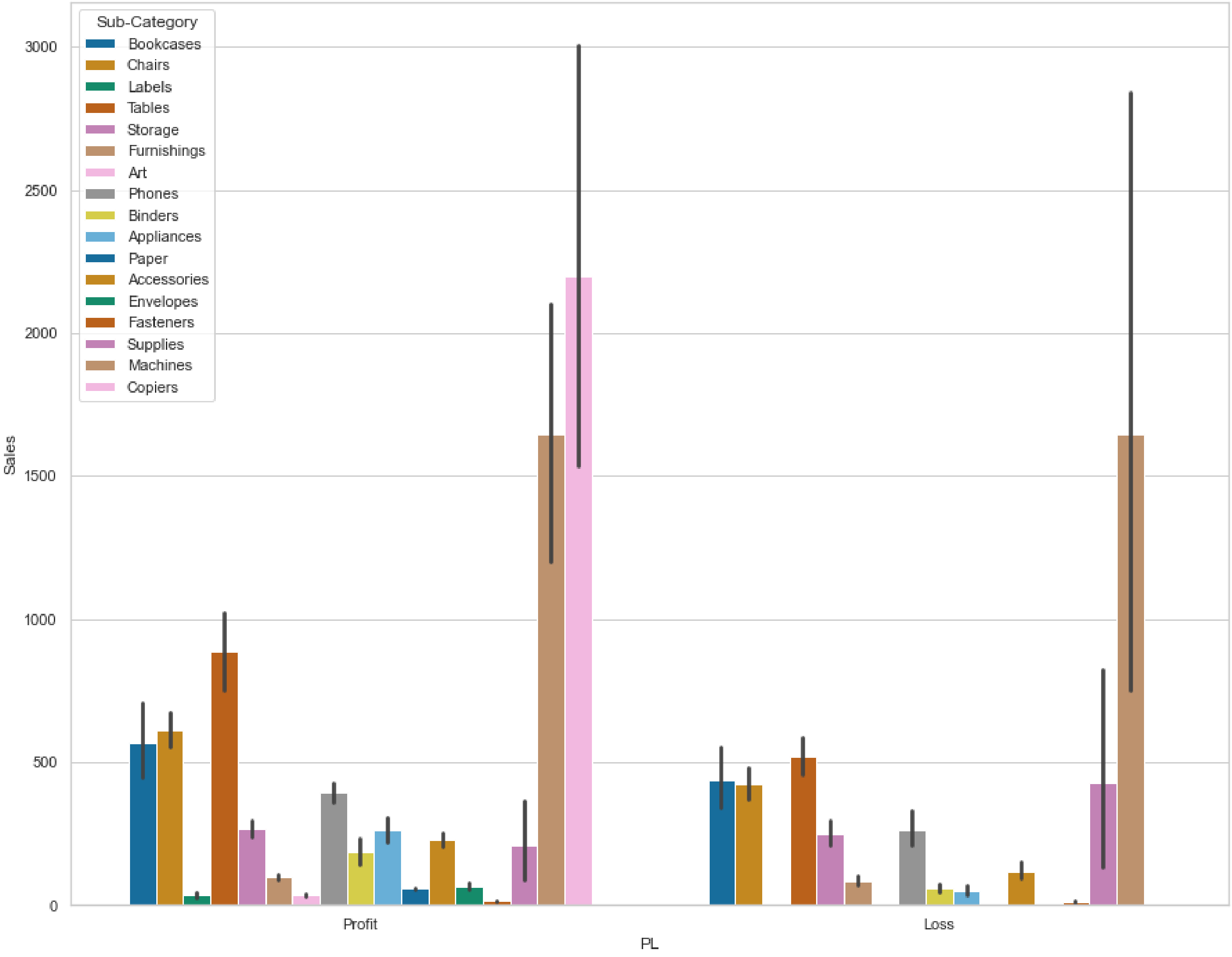
Profit-Loss BarPlot from Sub-Category

In [32]:

```
plt.figure(figsize = (15,12))
sns.set(style = 'whitegrid', color_codes = True)
pal = sns.color_palette("colorblind", len(data))
sns.barplot(x = 'PL', y = 'Sales', data = data, palette = pal, hue = 'Sub-Category')
```

Out[32]:

```
<AxesSubplot:xlabel='PL', ylabel='Sales'>
```



Discount effect on Profit and Sales of Product

In [33]:

```
plt.figure(figsize=(13,10))

pal = sns.color_palette("colorblind", len(data))
plt.subplot(2,1,1)
sns.barplot(x = 'Discount', y = 'Profit', palette = pal, data = data)

plt.subplot(2,1,2)
sns.barplot(x = 'Discount', y = 'Sales', palette = pal, data = data)
```

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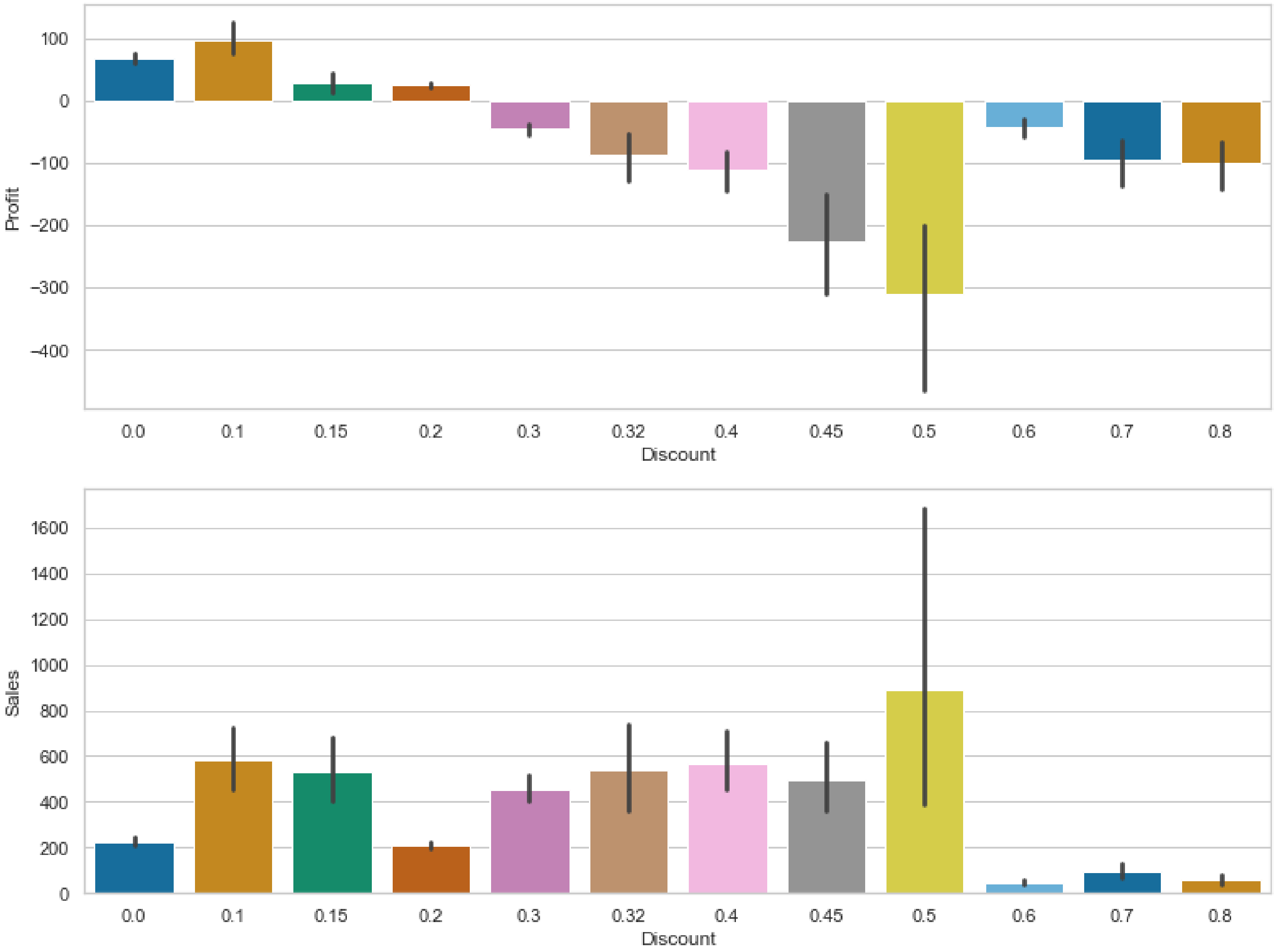
```
Out[33]: <AxesSubplot:xlabel='Discount', ylabel='Sales'>
```



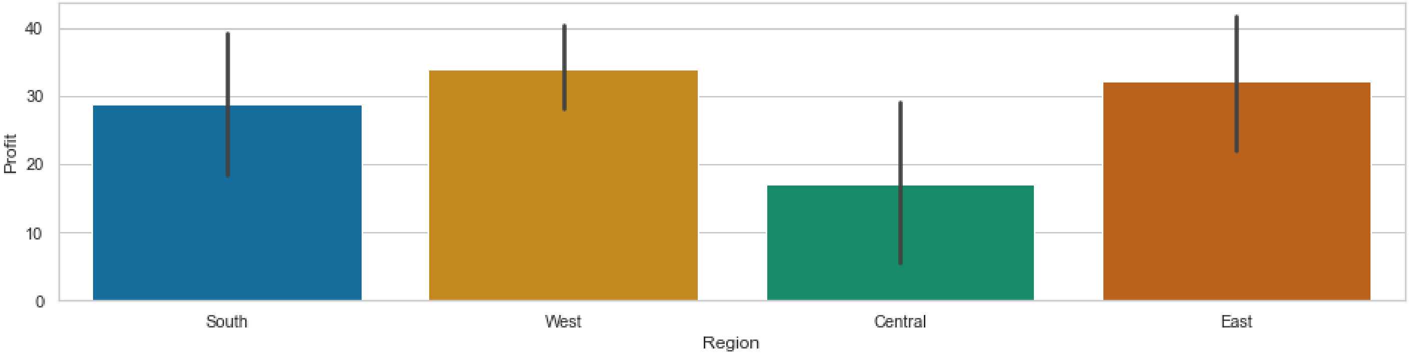
We can see the profit is lower when high discount is placed on the other hand discount increases Sales.

Profits by Region and States

```
In [34]:
# Profit by Region and States
plt.figure(figsize=(16,8))

pal = sns.color_palette("colorblind", len(data))
plt.subplot(2,1,1)
sns.barplot(x = 'Region', y = 'Profit', palette = pal, data = data)
```

```
Out[34]: <AxesSubplot:xlabel='Region', ylabel='Profit'>
```



Here we can observe that in west region shops makes highest profit and the shops of east comes after that. The company needs to focus on the profit of centeral region shops as its number is very low.

In [35]:

```
plt.figure(figsize=(18,10))
pal = sns.color_palette("colorblind", len(data))
sns.barplot(x='State', y='Profit', palette = pal, data = data)
plt.xticks(rotation=60)
```

Out[35]:

```
(array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 16,
        17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33,
        34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48]),
 [Text(0, 0, 'Kentucky'),
  Text(1, 0, 'California'),
  Text(2, 0, 'Florida'),
  Text(3, 0, 'North Carolina'),
  Text(4, 0, 'Washington'),
  Text(5, 0, 'Texas'),
  Text(6, 0, 'Wisconsin'),
  Text(7, 0, 'Utah'),
  Text(8, 0, 'Nebraska'),
  Text(9, 0, 'Pennsylvania'),
  Text(10, 0, 'Illinois'),
  Text(11, 0, 'Minnesota'),
  Text(12, 0, 'Michigan'),
  Text(13, 0, 'Delaware'),
  Text(14, 0, 'Indiana'),
  Text(15, 0, 'New York'),
  Text(16, 0, 'Arizona'),
  Text(17, 0, 'Virginia'),
  Text(18, 0, 'Tennessee'),
  Text(19, 0, 'Alabama'),
  Text(20, 0, 'South Carolina'),
  Text(21, 0, 'Oregon'),
  Text(22, 0, 'Colorado'),
  Text(23, 0, 'Iowa'),
  Text(24, 0, 'Ohio'),
  Text(25, 0, 'Missouri'),
  Text(26, 0, 'Oklahoma'),
  Text(27, 0, 'New Mexico'),
  Text(28, 0, 'Louisiana'),
  Text(29, 0, 'Connecticut'),
  Text(30, 0, 'New Jersey'),
  Text(31, 0, 'Massachusetts'),
  Text(32, 0, 'Georgia'),
  Text(33, 0, 'Nevada'),
  Text(34, 0, 'Rhode Island'),
  Text(35, 0, 'Mississippi'),
  Text(36, 0, 'Arkansas'),
  Text(37, 0, 'Montana'),
  Text(38, 0, 'New Hampshire'),
  Text(39, 0, 'Maryland'),
  Text(40, 0, 'District of Columbia'),
  Text(41, 0, 'Kansas'),
  Text(42, 0, 'Vermont'),
  Text(43, 0, 'Maine'),
  Text(44, 0, 'South Dakota'),
  Text(45, 0, 'Idaho'),
  Text(46, 0, 'North Dakota'),
  Text(47, 0, 'Wyoming'),
  Text(48, 0, 'West Virginia')])
```

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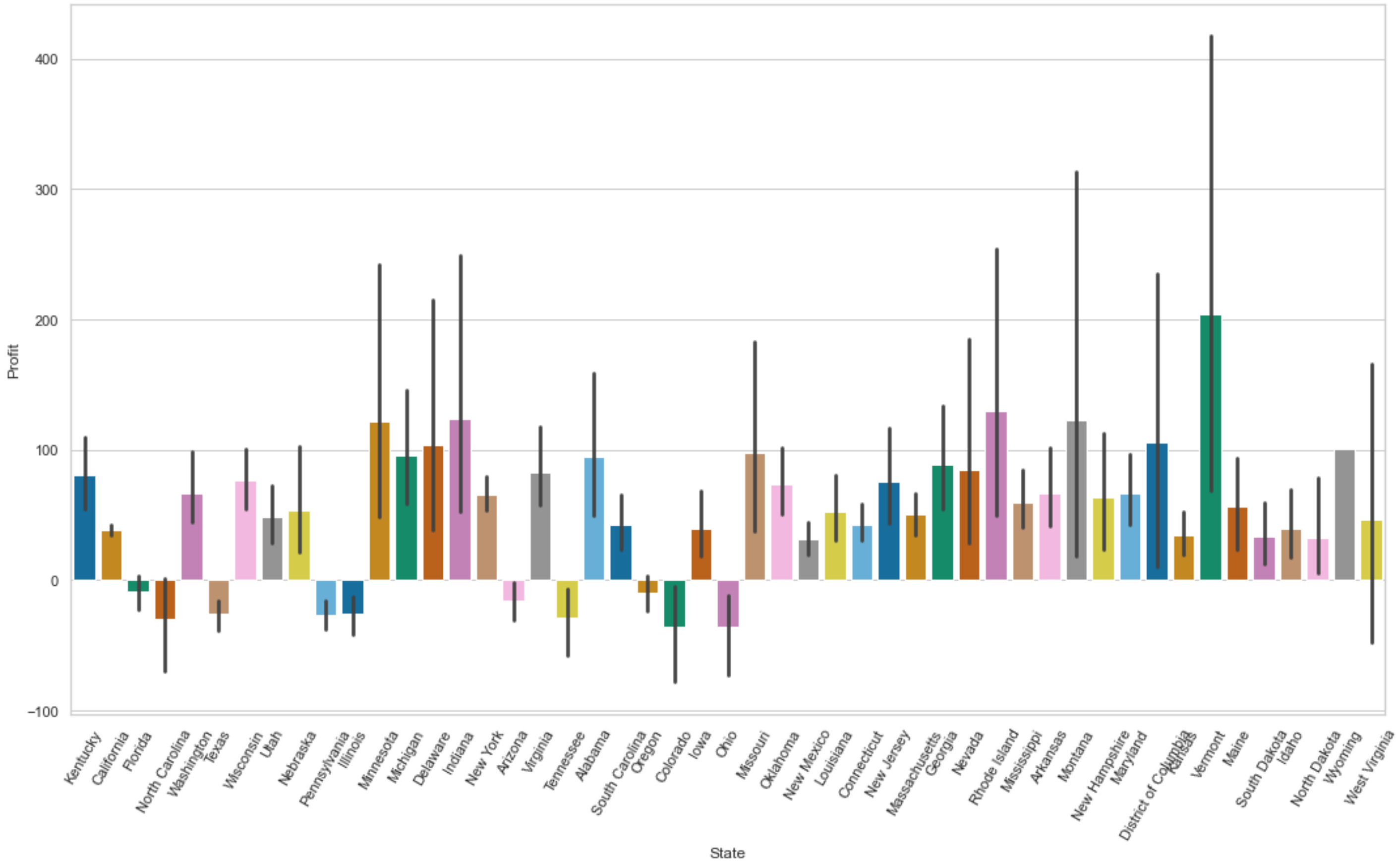


We can see that around 10 States are in loss and remaining are in Profit

Most used Shipping mode

In [36]:

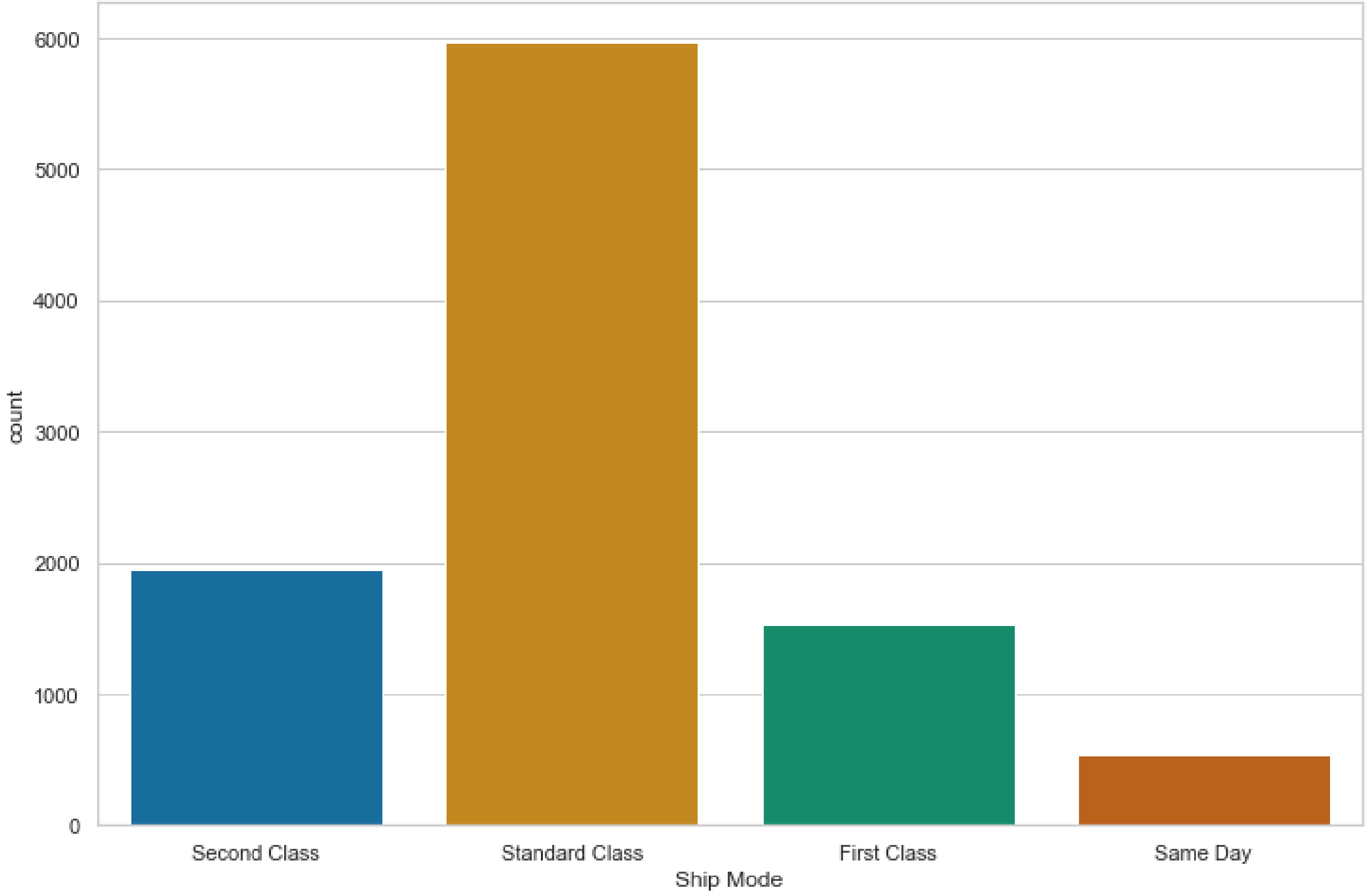
```
plt.figure(figsize=(12,8))

pal = sns.color_palette("colorblind", len(data))

sns.countplot('Ship Mode', palette = pal, data = data)
```

Out[36]:

```
<AxesSubplot:xlabel='Ship Mode', ylabel='count'>
```



Standard Class is the most popular shipping mode.

Most Popular Segment

In [37]:

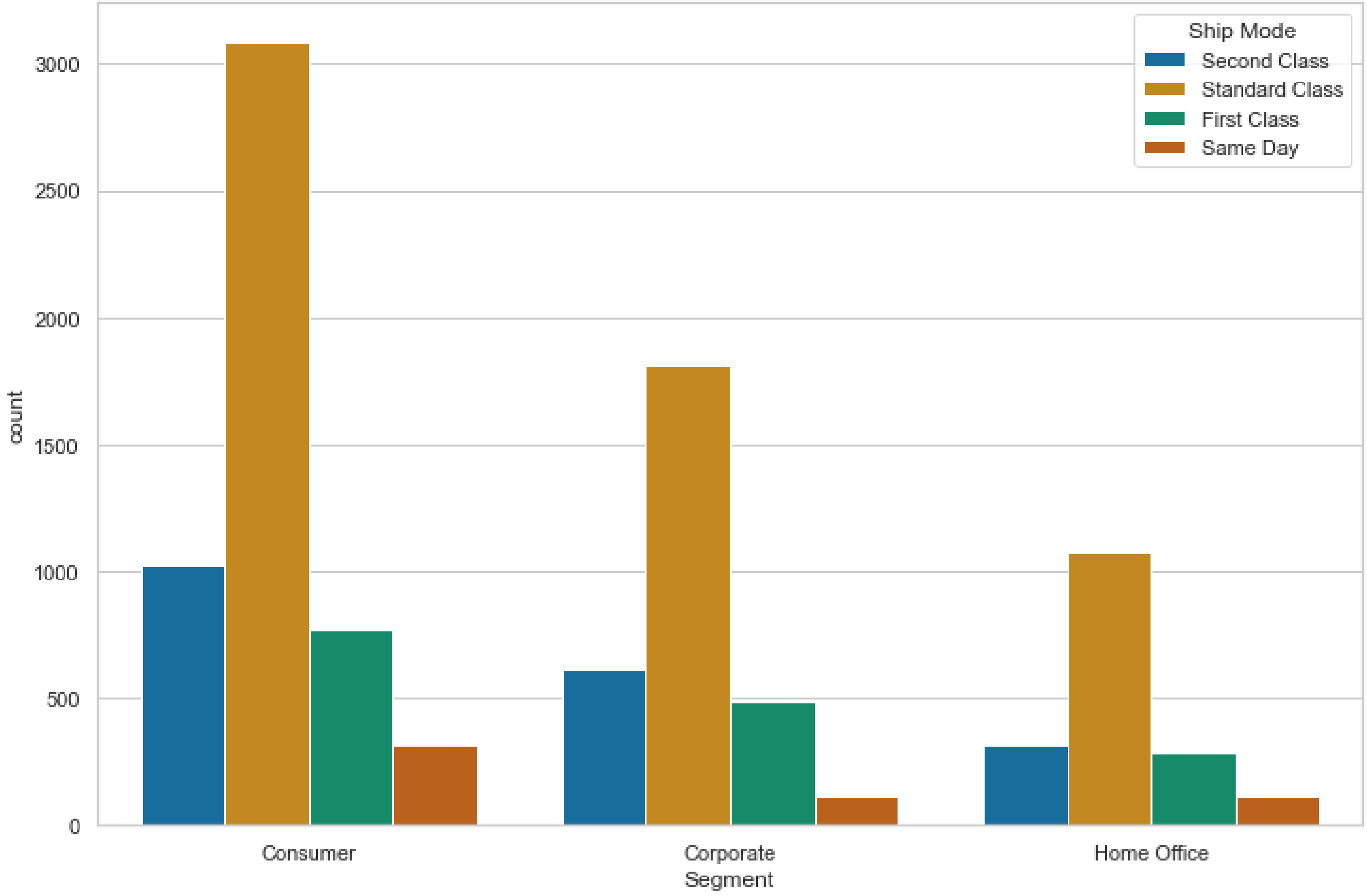
```
plt.figure(figsize=(12,8))

pal = sns.color_palette("colorblind", len(data))

sns.countplot('Segment', palette = pal, data = data, hue = 'Ship Mode')
```

Out[37]:

```
<AxesSubplot:xlabel='Segment', ylabel='count'>
```



We can refer from the above graph , standard class is popular for all segment as second class is also quite used one.

THANK YOU SO MUCH!!