In [1]:
```
import numpy as np #use for mathematical calculation/arrays
import pandas as pd #use for Data frame/ tables
import matplotlib.pyplot as plt # visualizing data
%matplotlib inline
import seaborn as sns
```

In [2]:
```
df = pd.read_csv('Diwali Sales Data.csv', encoding= 'unicode_escape')
```

In [3]:
```
df.shape
```

Out[3]: (11251, 15)

In [4]:
```
df.head(10)
```

Out[4]:

	User_ID	Cust_name	Product_ID	Gender	Age Group	Age	Marital_Status	Stat
0	1002903	Sanskriti	P00125942	F	26-35	28	0	Maharashtı
1	1000732	Kartik	P00110942	F	26-35	35	1	Andhra Prades
2	1001990	Bindu	P00118542	F	26-35	35	1	Uttar Prades
3	1001425	Sudevi	P00237842	M	0-17	16	0	Karnatak
4	1000588	Joni	P00057942	M	26-35	28	1	Gujara
5	1000588	Joni	P00057942	M	26-35	28	1	Himach Prades
6	1001132	Balk	P00018042	F	18-25	25	1	Uttar Prades
7	1002092	Shivangi	P00273442	F	55+	61	0	Maharashtı
8	1003224	Kushal	P00205642	M	26-35	35	0	Uttar Prades
9	1003650	Ginny	P00031142	F	26-35	26	1	Andhra Prades

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

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 11251 entries, 0 to 11250
Data columns (total 15 columns):
 #   Column            Non-Null Count  Dtype  
---  ------            --------------  -----  
 0   User_ID           11251 non-null  int64  
 1   Cust_name         11251 non-null  object 
 2   Product_ID        11251 non-null  object 
 3   Gender            11251 non-null  object 
 4   Age Group         11251 non-null  object 
 5   Age               11251 non-null  int64  
 6   Marital_Status    11251 non-null  int64  
 7   State             11251 non-null  object 
 8   Zone              11251 non-null  object 
 9   Occupation        11251 non-null  object 
 10  Product_Category  11251 non-null  object 
 11  Orders            11251 non-null  int64  
 12  Amount            11239 non-null  float64
 13  Status            0 non-null      float64
 14  unnamed1          0 non-null      float64
dtypes: float64(3), int64(4), object(8)
memory usage: 1.3+ MB
```

In [6]:
```
df.drop(['Status', 'unnamed1'], axis=1, inplace=True)
```

In [7]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 11251 entries, 0 to 11250
Data columns (total 13 columns):
 #   Column            Non-Null Count  Dtype  
---  ------            --------------  -----  
 0   User_ID           11251 non-null  int64  
 1   Cust_name         11251 non-null  object 
 2   Product_ID        11251 non-null  object 
 3   Gender            11251 non-null  object 
 4   Age Group         11251 non-null  object 
 5   Age               11251 non-null  int64  
 6   Marital_Status    11251 non-null  int64  
 7   State             11251 non-null  object 
 8   Zone              11251 non-null  object 
 9   Occupation        11251 non-null  object 
 10  Product_Category  11251 non-null  object 
 11  Orders            11251 non-null  int64  
 12  Amount            11239 non-null  float64
dtypes: float64(1), int64(4), object(8)
memory usage: 1.1+ MB
```

In [8]:
```
pd.isnull(df).sum()
```

Out[8]:
```
User_ID             0
Cust_name           0
Product_ID          0
Gender              0
Age Group           0
Age                 0
Marital_Status      0
State               0
Zone                0
Occupation          0
Product_Category    0
Orders              0
Amount             12
dtype: int64
```

In [9]:
```
df.shape
```

Out[9]:
```
(11251, 13)
```

In [10]:
```
df.dropna(inplace=True)
```

In [11]:
```
df.shape
```

Out[11]:
```
(11239, 13)
```

Change DAtatype

In [13]:
```
df['Amount'] = df['Amount'].astype('int')
```

In [14]:
```
df['Amount'].dtypes
```

Out[14]:
```
dtype('int32')
```

In [15]:
```
df.columns
```

Out[15]:
```
Index(['User_ID', 'Cust_name', 'Product_ID', 'Gender', 'Age Group', 'Age',
       'Marital_Status', 'State', 'Zone', 'Occupation', 'Product_Category',
       'Orders', 'Amount'],
      dtype='object')
```

In [16]:
```
df.rename(columns= {'Marital_Status':'Shaadi'})
```

Out[16]:

	User_ID	Cust_name	Product_ID	Gender	Age Group	Age	Shaadi	State
0	1002903	Sanskriti	P00125942	F	26-35	28	0	Maharashtra
1	1000732	Kartik	P00110942	F	26-35	35	1	Andhra Pradesh
2	1001990	Bindu	P00118542	F	26-35	35	1	Uttar Pradesh
3	1001425	Sudevi	P00237842	M	0-17	16	0	Karnataka
4	1000588	Joni	P00057942	M	26-35	28	1	Gujarat
...	...	...	...	...	...	...	...	...
11246	1000695	Manning	P00296942	M	18-25	19	1	Maharashtra
11247	1004089	Reichenbach	P00171342	M	26-35	33	0	Haryana
11248	1001209	Oshin	P00201342	F	36-45	40	0	Madhya Pradesh
11249	1004023	Noonan	P00059442	M	36-45	37	0	Karnataka
11250	1002744	Brumley	P00281742	F	18-25	19	0	Maharashtra

11239 rows × 13 columns

In [17]:
```
df.describe()
```

Out[17]:

	User_ID	Age	Marital_Status	Orders	Amount
count	1.123900e+04	11239.000000	11239.000000	11239.000000	11239.000000
mean	1.003004e+06	35.410357	0.420055	2.489634	9453.610553
std	1.716039e+03	12.753866	0.493589	1.114967	5222.355168
min	1.000001e+06	12.000000	0.000000	1.000000	188.000000
25%	1.001492e+06	27.000000	0.000000	2.000000	5443.000000
50%	1.003064e+06	33.000000	0.000000	2.000000	8109.000000
75%	1.004426e+06	43.000000	1.000000	3.000000	12675.000000
max	1.006040e+06	92.000000	1.000000	4.000000	23952.000000

In [18]:
```
df[['Age', 'Orders', 'Amount']].describe()
```

Out[18]:

	Age	Orders	Amount
count	11239.000000	11239.000000	11239.000000
mean	35.410357	2.489634	9453.610553
std	12.753866	1.114967	5222.355168
min	12.000000	1.000000	188.000000
25%	27.000000	2.000000	5443.000000
50%	33.000000	2.000000	8109.000000
75%	43.000000	3.000000	12675.000000
max	92.000000	4.000000	23952.000000

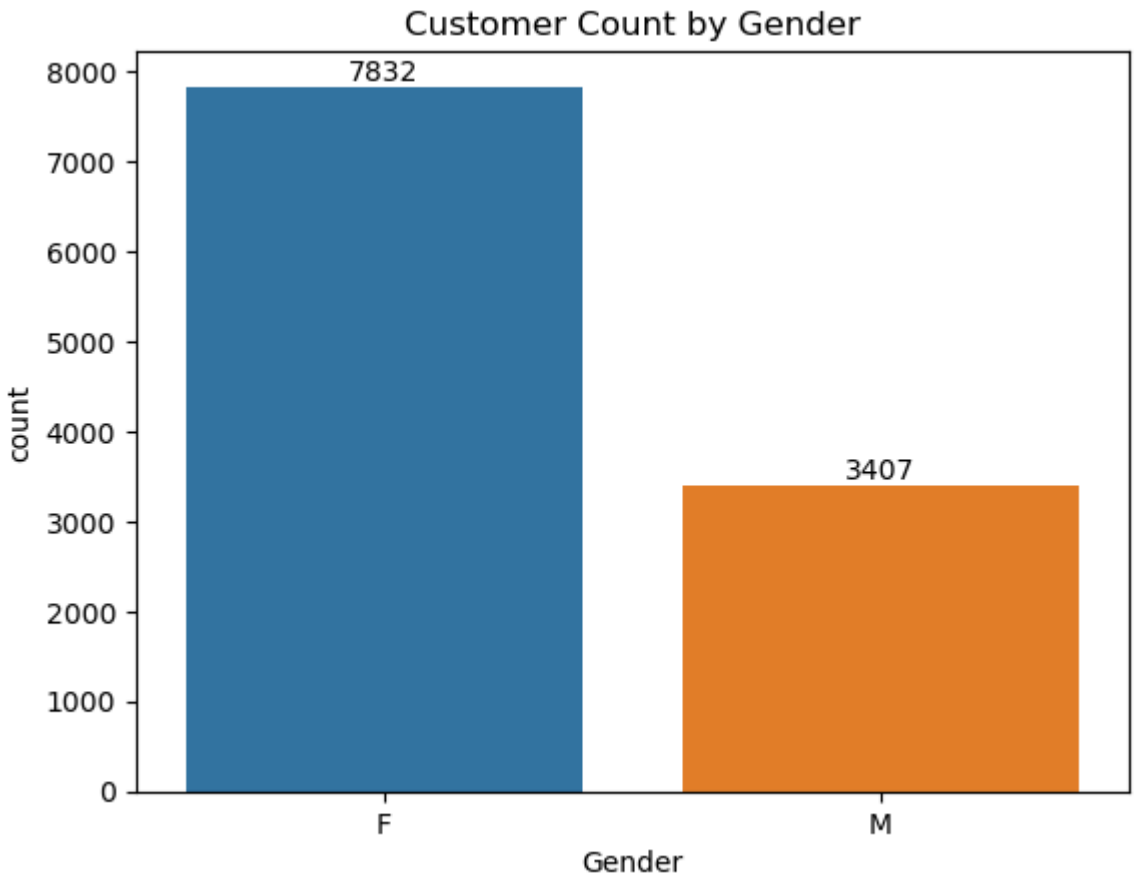
Exploratory Data Analysis

Gender

In [19]:
```
df.columns
```

Out[19]:
```
Index(['User_ID', 'Cust_name', 'Product_ID', 'Gender', 'Age Group', 'Age',
       'Marital_Status', 'State', 'Zone', 'Occupation', 'Product_Category',
       'Orders', 'Amount'],
      dtype='object')
```

In [20]:
```
ax = sns.countplot(x = 'Gender',data = df)
plt.title("Customer Count by Gender")
for bars in ax.containers:
    ax.bar_label(bars)
```



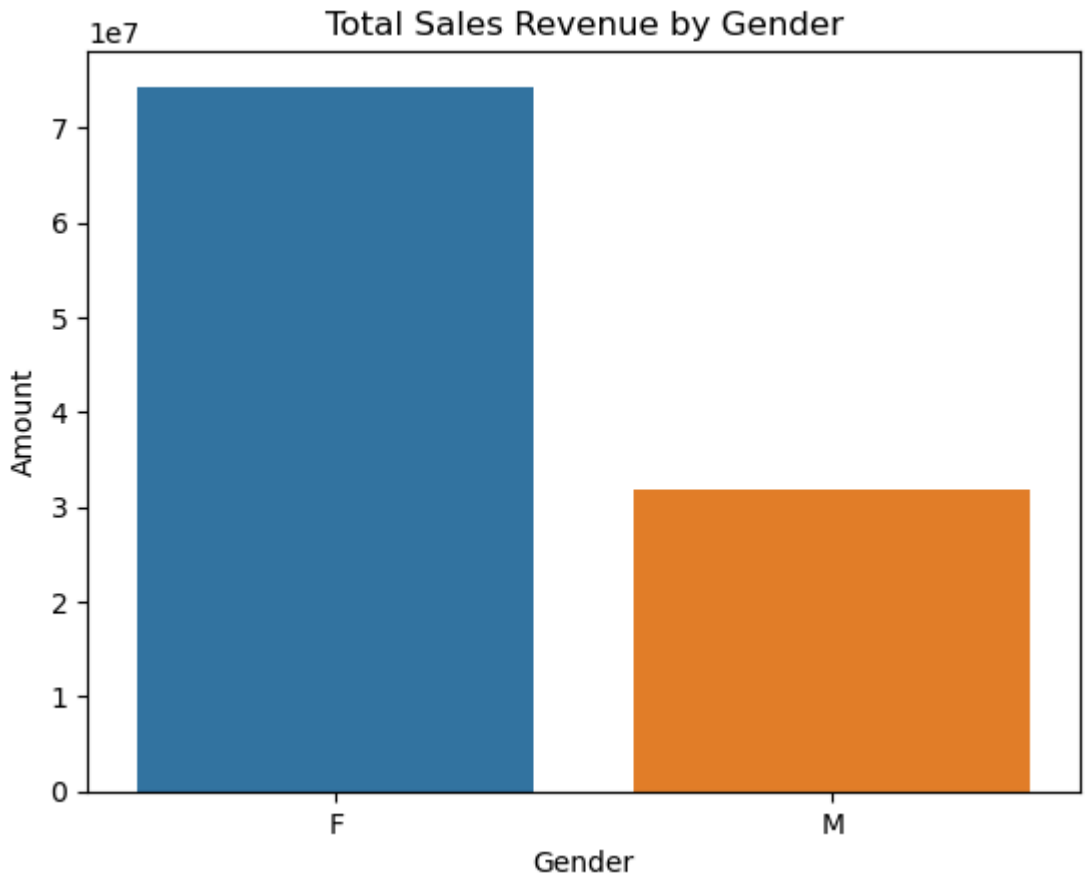
In [21]:
```
df.groupby(['Gender'], as_index=False)['Amount'].sum().sort_values(by='Amount',
```

Out[21]:

	Gender	Amount
0	F	74335853
1	M	31913276

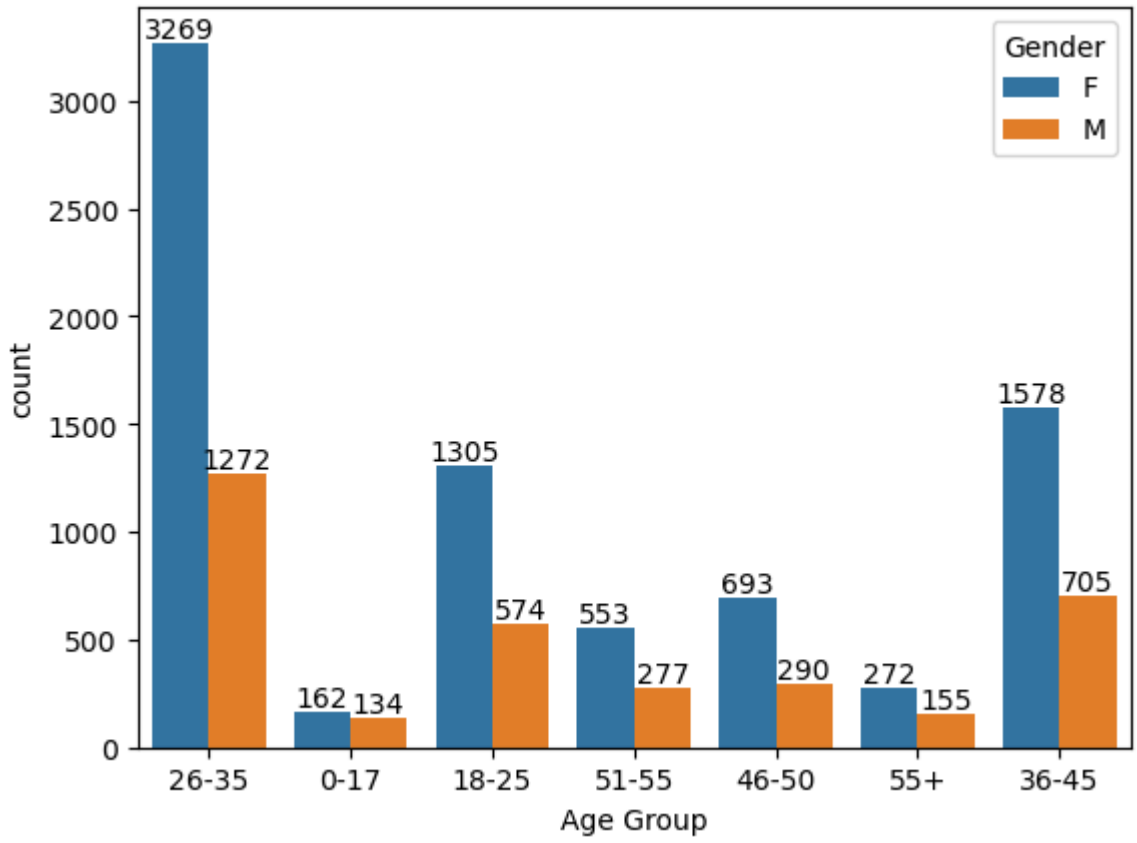
In [22]:
```
sales_gen = df.groupby(['Gender'], as_index=False)['Amount'].sum().sort_values(b
plt.title("Total Sales Revenue by Gender")
sns.barplot(x = 'Gender',y= 'Amount' ,data = sales_gen)
```

Out[22]:
```
<Axes: title={'center': 'Total Sales Revenue by Gender'}, xlabel='Gender', ylab
el='Amount'>
```



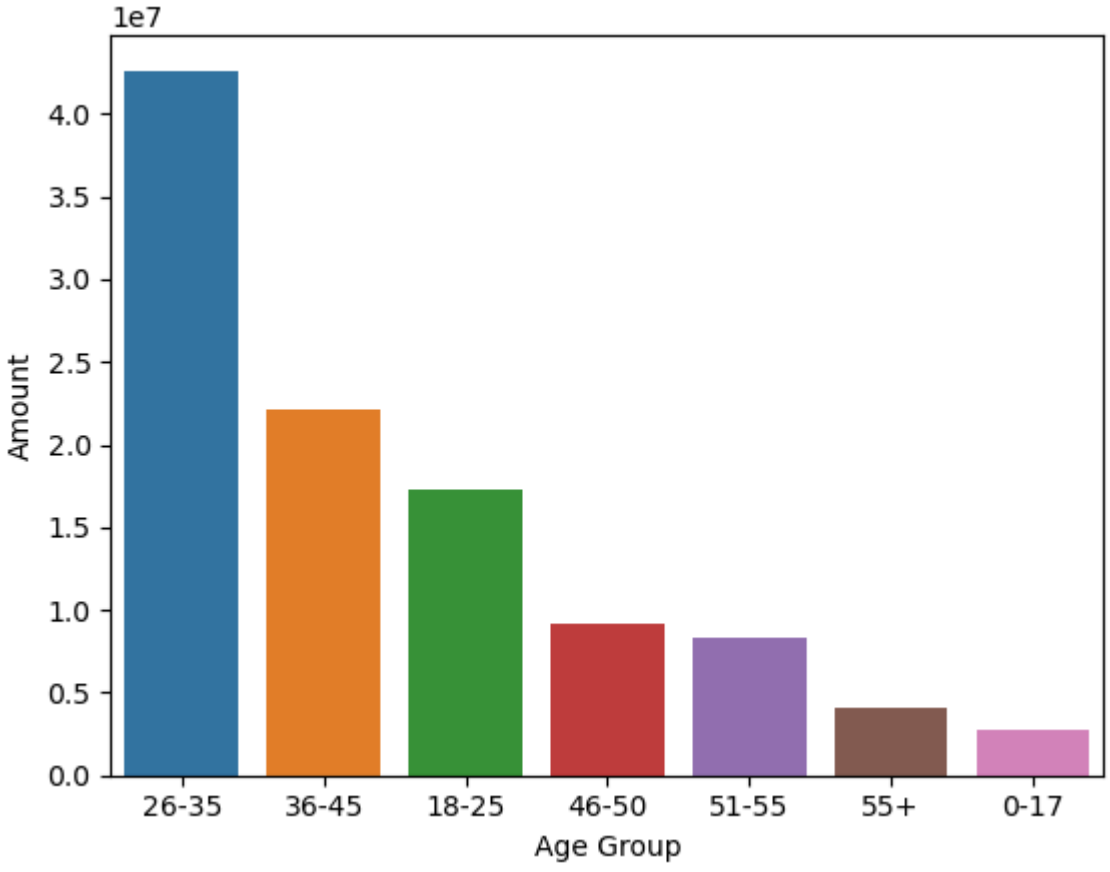
Age

In [23]:
```
ax = sns.countplot(data = df, x = 'Age Group', hue = 'Gender')

for bars in ax.containers:
    ax.bar_label(bars)
```



In [24]:
```
sales_age = df.groupby(['Age Group'], as_index=False)['Amount'].sum().sort_value

sns.barplot(x = 'Age Group',y= 'Amount' ,data = sales_age)
```

Out[24]: <Axes: xlabel='Age Group', ylabel='Amount'>



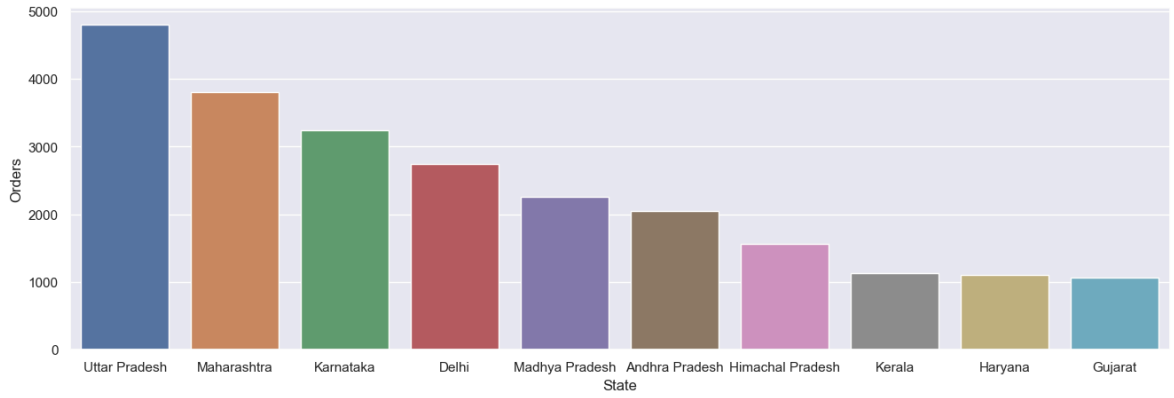
State

In [25]:
```
df.columns
```

Out[25]:
```
Index(['User_ID', 'Cust_name', 'Product_ID', 'Gender', 'Age Group', 'Age',
       'Marital_Status', 'State', 'Zone', 'Occupation', 'Product_Category',
       'Orders', 'Amount'],
      dtype='object')
```

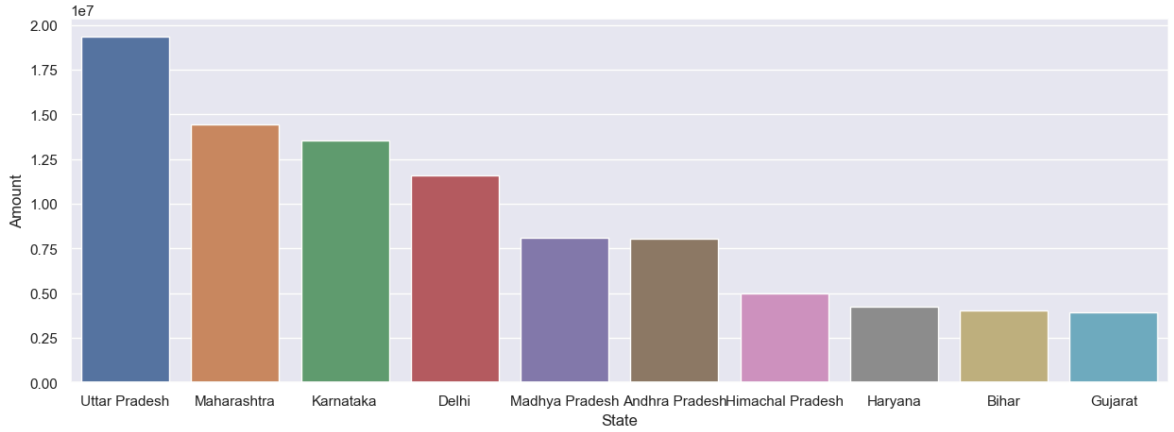
In [26]:
```
sales_state = df.groupby(['State'], as_index=False)['Orders'].sum().sort_values(

sns.set(rc={'figure.figsize':(16,5)}) #size chart
sns.barplot(data = sales_state, x = 'State',y= 'Orders')
```

Out[26]:
```
<Axes: xlabel='State', ylabel='Orders'>
```



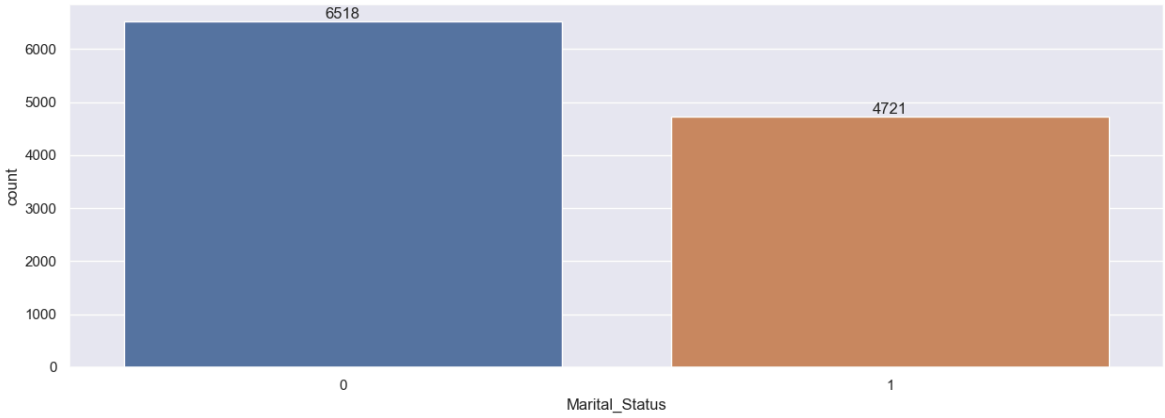
In [27]:
```
sales_state = df.groupby(['State'], as_index=False)['Amount'].sum().sort_values(

sns.set(rc={'figure.figsize':(15,5)})
sns.barplot(data = sales_state, x = 'State',y= 'Amount')
```

Out[27]:
```
<Axes: xlabel='State', ylabel='Amount'>
```



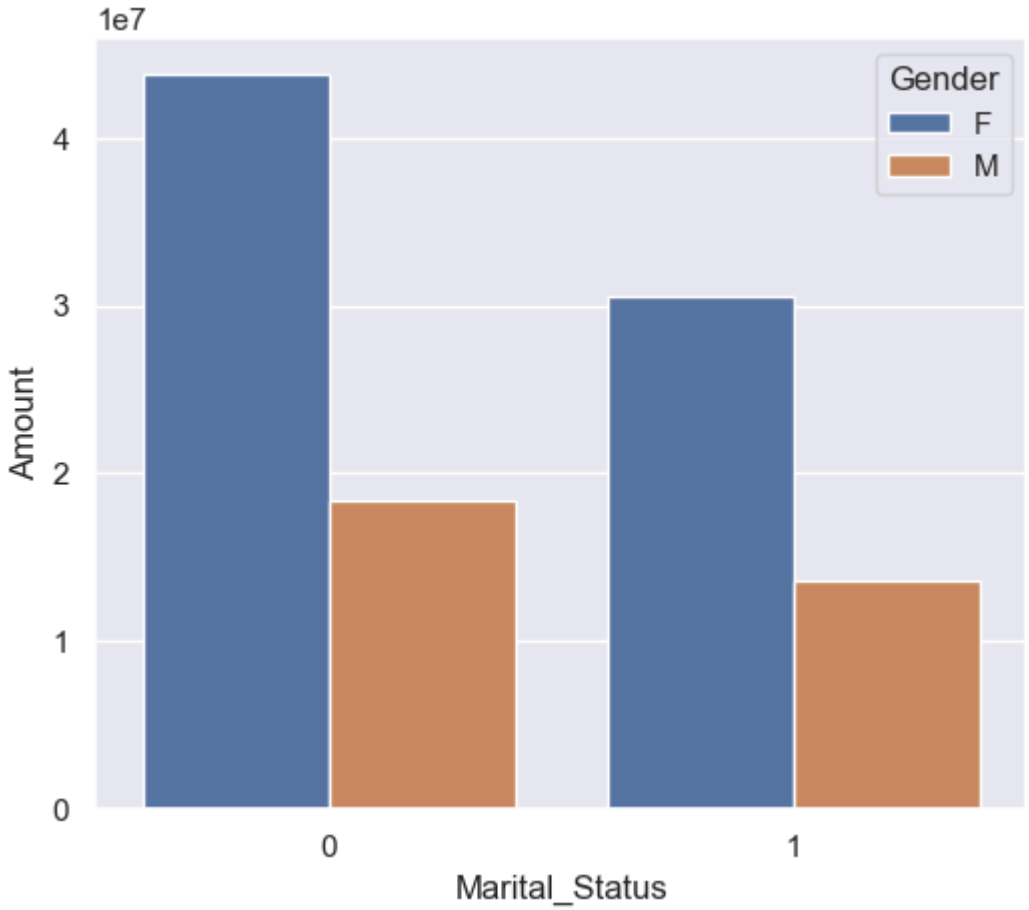
Marital Status

In [28]:
```
ax = sns.countplot(data = df, x = 'Marital_Status')

sns.set(rc={'figure.figsize':(7,5)})
for bars in ax.containers:
    ax.bar_label(bars)
```



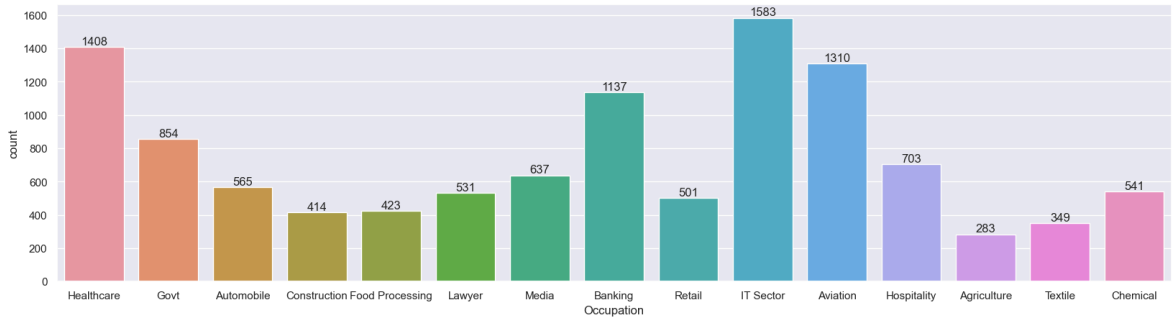
In [29]:
```
sales_state = df.groupby(['Marital_Status', 'Gender'], as_index=False)['Amount']

sns.set(rc={'figure.figsize':(6,5)})
sns.barplot(data = sales_state, x = 'Marital_Status',y= 'Amount', hue='Gender')
```

Out[29]: <Axes: xlabel='Marital_Status', ylabel='Amount'>



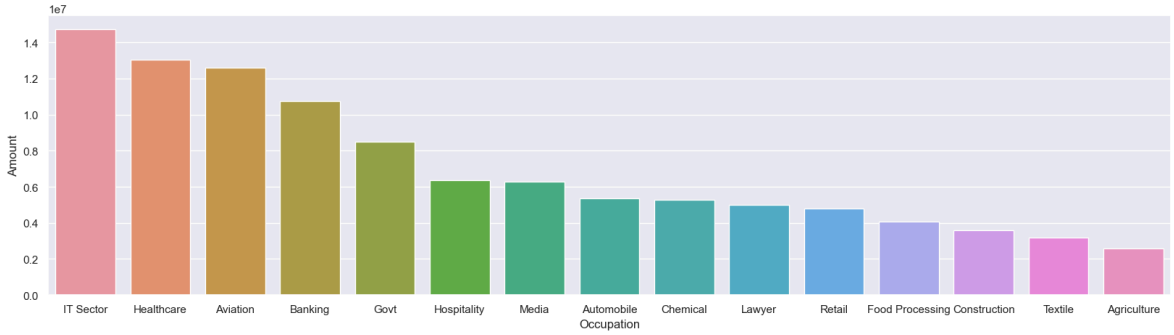
Occupation

In [30]:
```
sns.set(rc={'figure.figsize':(20,5)})
ax = sns.countplot(data = df, x = 'Occupation')

for bars in ax.containers:
    ax.bar_label(bars)
```



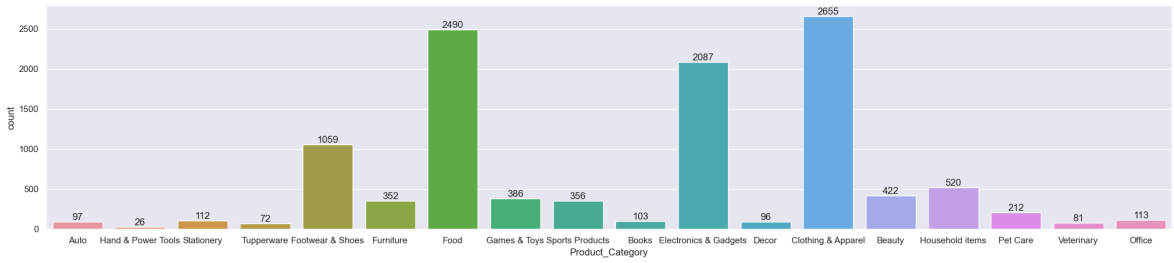
In [31]:
```
sales_state = df.groupby(['Occupation'], as_index=False)['Amount'].sum().sort_va

sns.set(rc={'figure.figsize':(20,5)})
sns.barplot(data = sales_state, x = 'Occupation',y= 'Amount')
```

Out[31]: <Axes: xlabel='Occupation', ylabel='Amount'>



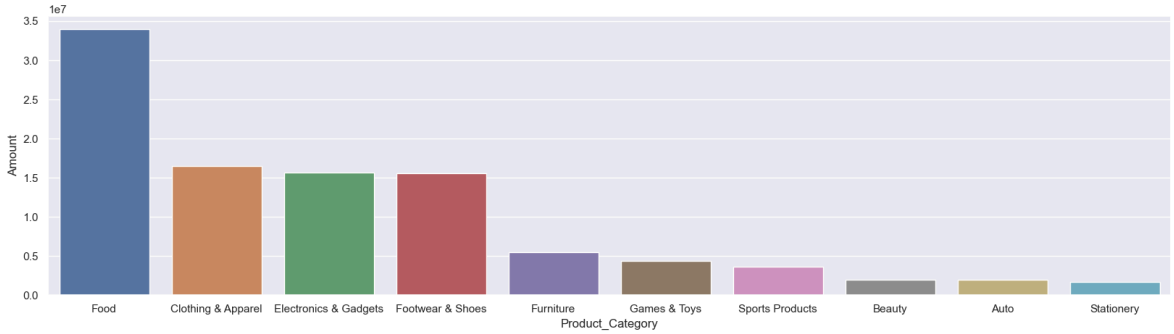
Product Category

In [32]:
```
sns.set(rc={'figure.figsize':(25,5)})
ax = sns.countplot(data = df, x = 'Product_Category')

for bars in ax.containers:
    ax.bar_label(bars)
```



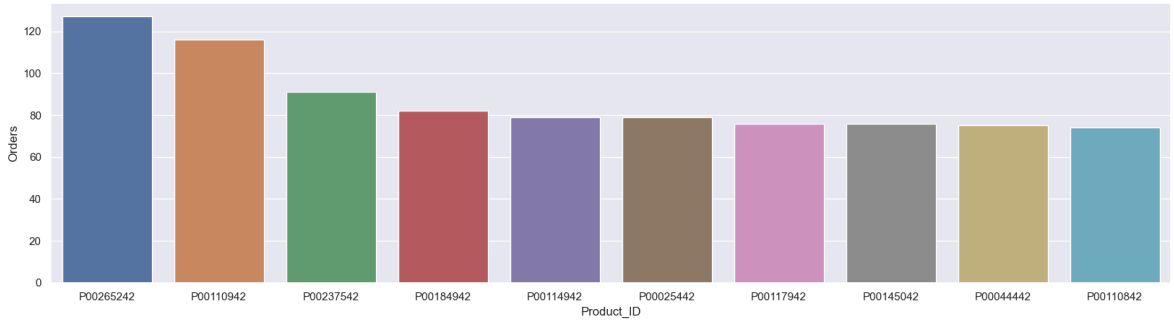
In [33]:
```
sales_state = df.groupby(['Product_Category'], as_index=False)['Amount'].sum().s

sns.set(rc={'figure.figsize':(20,5)})
sns.barplot(data = sales_state, x = 'Product_Category',y= 'Amount')
```

Out[33]: <Axes: xlabel='Product_Category', ylabel='Amount'>



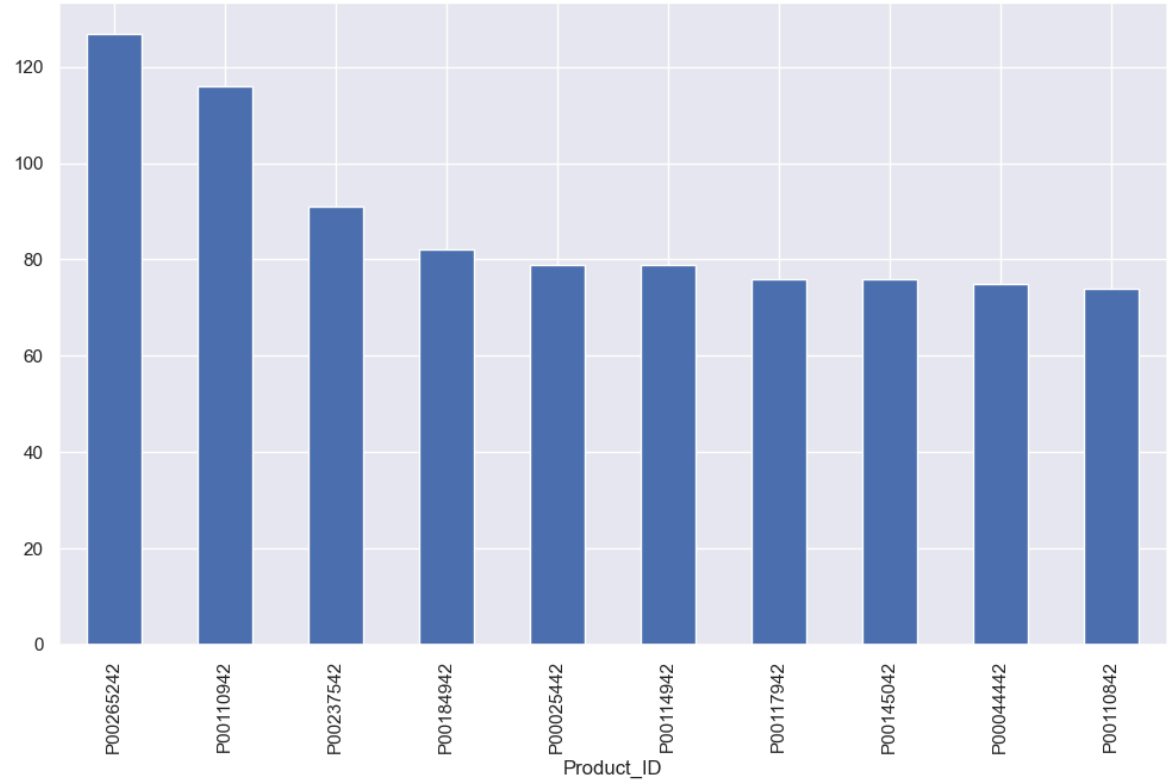
In [34]:
```
sales_state = df.groupby(['Product_ID'], as_index=False)['Orders'].sum().sort_va

sns.set(rc={'figure.figsize':(20,5)})
sns.barplot(data = sales_state, x = 'Product_ID',y= 'Orders')
```

Out[34]: <Axes: xlabel='Product_ID', ylabel='Orders'>



In [35]:
```
fig1, ax1 = plt.subplots(figsize=(12,7))
df.groupby('Product_ID')['Orders'].sum().nlargest(10).sort_values(ascending=Fals
```

Out[35]: <Axes: xlabel='Product_ID'>



In [ ]: