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

In [5]:
```
df = pd.read_csv('Diwali Sales Data.csv', encoding='unicode_escape')
print('connected to the dataframe')
```

```
connected to the dataframe
```

In [6]:
```
df.head()
```

Out[6]:

	User_ID	Cust_name	Product_ID	Gender	Age Group	Age	Marital_Status	State	
0	1002903	Sanskriti	P00125942	F	26-35	28	0	Maharashtra	We
1	1000732	Kartik	P00110942	F	26-35	35	1	Andhra Pradesh	Sou
2	1001990	Bindu	P00118542	F	26-35	35	1	Uttar Pradesh	C
3	1001425	Sudevi	P00237842	M	0-17	16	0	Karnataka	Sou
4	1000588	Joni	P00057942	M	26-35	28	1	Gujarat	We

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

Out[11]:
```
(11251, 15)
```

In [18]:
```
df.head()
```

Out[18]:

	User_ID	Cust_name	Product_ID	Gender	Age Group	Age	Marital_Status	State	
0	1002903	Sanskriti	P00125942	F	26-35	28	0	Maharashtra	We
1	1000732	Kartik	P00110942	F	26-35	35	1	Andhra Pradesh	Sou
2	1001990	Bindu	P00118542	F	26-35	35	1	Uttar Pradesh	C
3	1001425	Sudevi	P00237842	M	0-17	16	0	Karnataka	Sou
4	1000588	Joni	P00057942	M	26-35	28	1	Gujarat	We

In [14]:
```
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 [26]:
```
df.drop(['Status', 'unnamed1'], axis=1, inplace=True)
df
```

Out[26]:

	User_ID	Cust_name	Product_ID	Gender	Age Group	Age	Marital_Status	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

11251 rows × 13 columns

In [27]:
```
pd.isnull(df).sum()
```

Out[27]:
```
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 [32]:
```
df.dropna(inplace=True)
df
```

Out[32]:

	User_ID	Cust_name	Product_ID	Gender	Age Group	Age	Marital_Status	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 [33]:
```
df['Amount']=df['Amount'].astype('int')
```

In [34]:
```
df['Amount'].dtypes
```

Out[34]:
```
dtype('int32')
```

In [36]:
```
df.keys()
```

Out[36]:
```
Index(['User_ID', 'Cust_name', 'Product_ID', 'Gender', 'Age Group', 'Age',
       'Marital_Status', 'State', 'Zone', 'Occupation', 'Product_Categor
y',
       'Orders', 'Amount'],
      dtype='object')
```

In [38]:
```
df.columns
```

Out[38]:
```
Index(['User_ID', 'Cust_name', 'Product_ID', 'Gender', 'Age Group', 'Age',
       'Marital_Status', 'State', 'Zone', 'Occupation', 'Product_Categor
y',
       'Orders', 'Amount'],
      dtype='object')
```

In [47]:
```
df.rename(columns= {'Marital_Status':'Shaadi'})
```

Out[47]:

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

11239 rows × 13 columns

In [49]:
```
df.describe()
```

Out[49]:

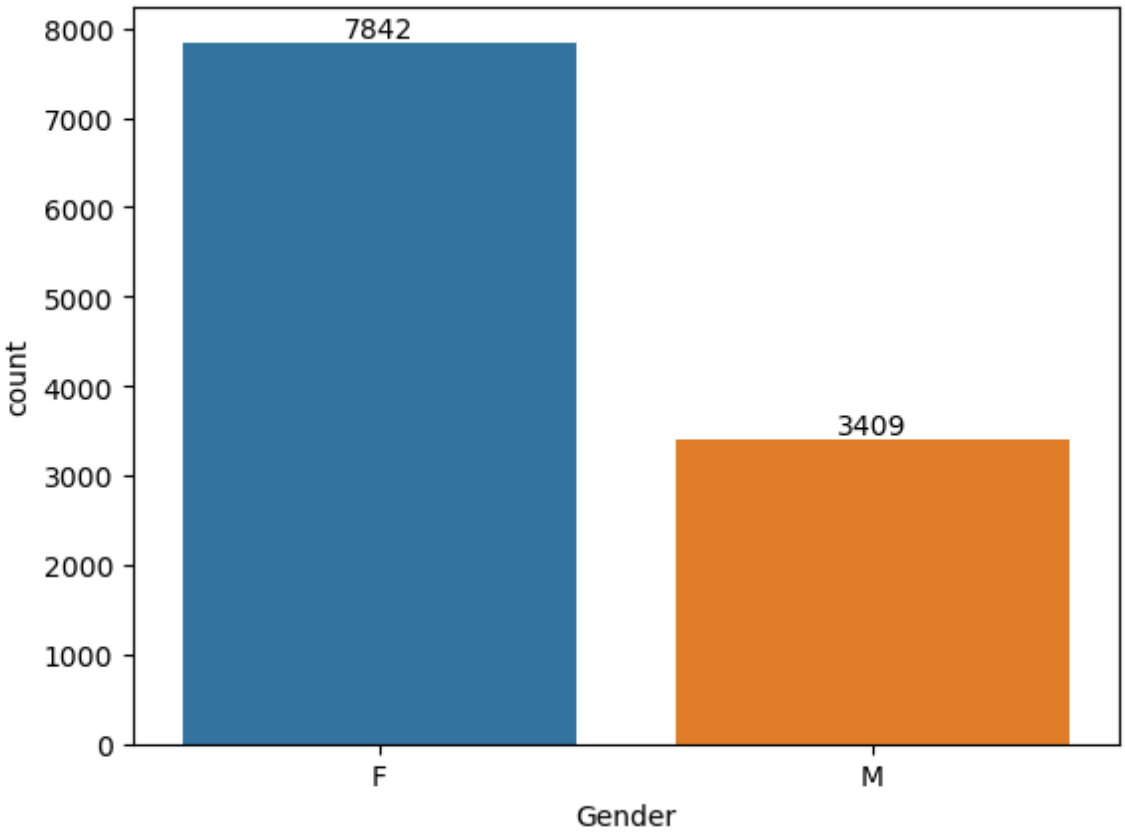
	User_ID	Age	Marital_Status	Orders	Amount
count	1.123900e+04	11239.000000	11239.000000	11239.000000	11239.000000
mean	1.003004e+06	35.410357	0.420055	2.489634	9453.610553
std	1.716039e+03	12.753866	0.493589	1.114967	5222.355168
min	1.000001e+06	12.000000	0.000000	1.000000	188.000000
25%	1.001492e+06	27.000000	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 [58]:
```
df[['Age','Orders','Amount']].describe()
```

Out[58]:

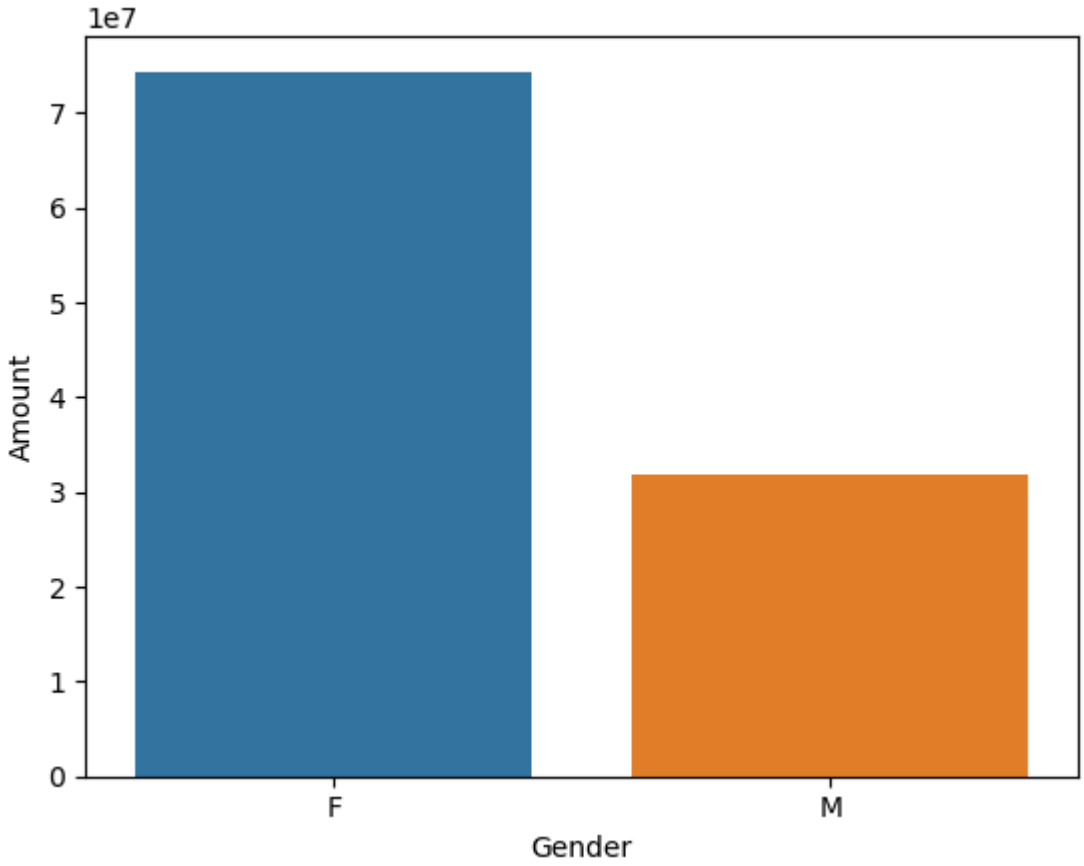
	Age	Orders	Amount
count	11239.000000	11239.000000	11239.000000
mean	35.410357	2.489634	9453.610553
std	12.753866	1.114967	5222.355168
min	12.000000	1.000000	188.000000
25%	27.000000	2.000000	5443.000000
50%	33.000000	2.000000	8109.000000
75%	43.000000	3.000000	12675.000000
max	92.000000	4.000000	23952.000000

In [7]:
```
Bar_chart = sns.countplot(x = 'Gender',data =df)
for bars in Bar_chart.containers:
    Bar_chart.bar_label(bars)
```



In [8]:
```
sales_gen = df.groupby(['Gender'], as_index = False)['Amount'].sum().sort_va

sns.barplot(x = 'Gender', y = 'Amount', data = sales_gen)
```

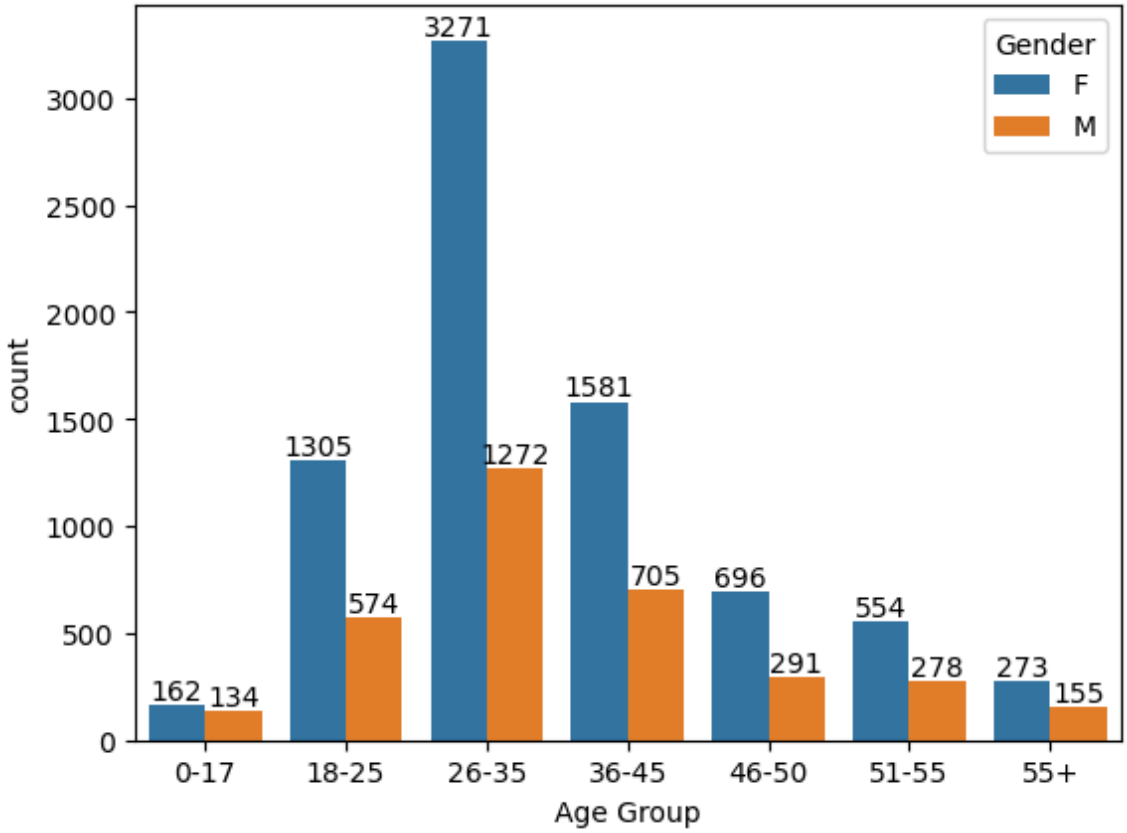
Out[8]: <Axes: xlabel='Gender', ylabel='Amount'>




```
From above graphs we can see that most of the buyers are females and even
the purchasing power of females are greater than men
```

AGE:

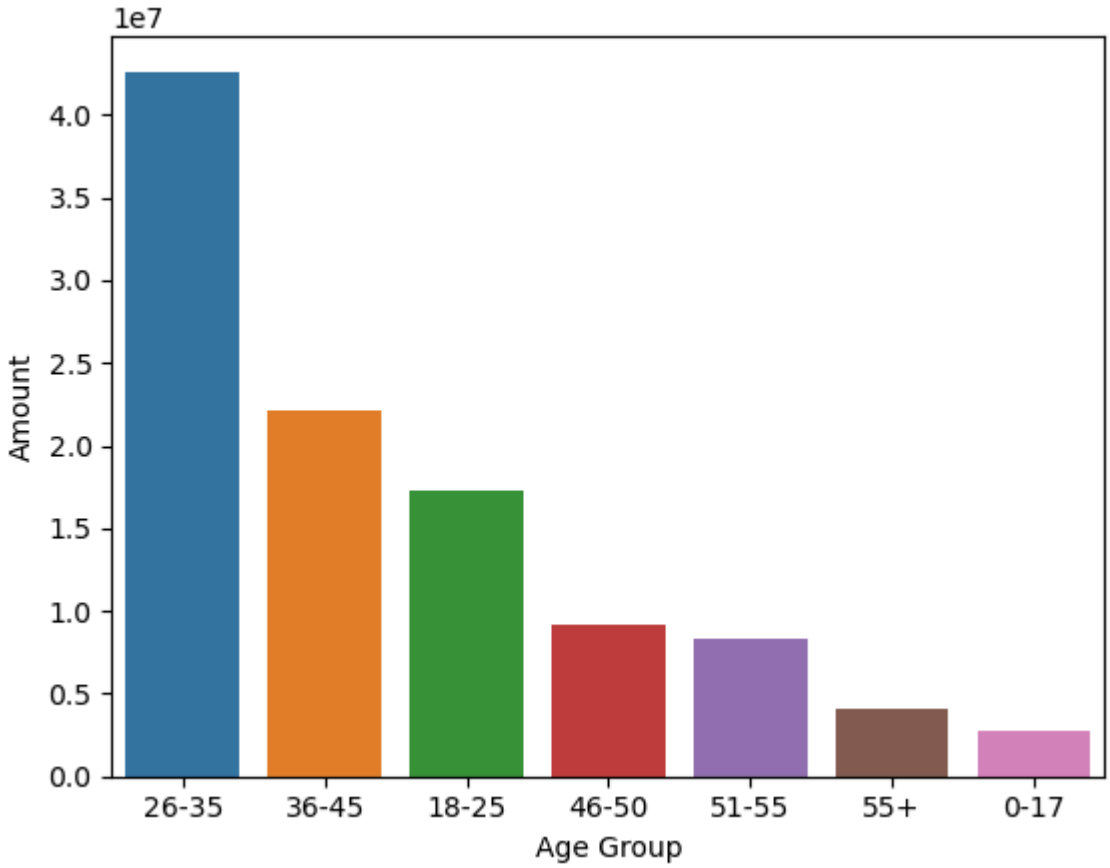
In [19]:
```
df_sorted = df.sort_values(by='Age Group', ascending= True)
ax = sns.countplot(data=df_sorted, x='Age Group', hue='Gender')

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



From above graphs we can see that most of the count are of age group between 26-35 yrs female

In [24]:
```
## Total_Amount vs Age_Group

sales_age = df.groupby(['Age Group'], as_index = False)['Amount'].sum().sort

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

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

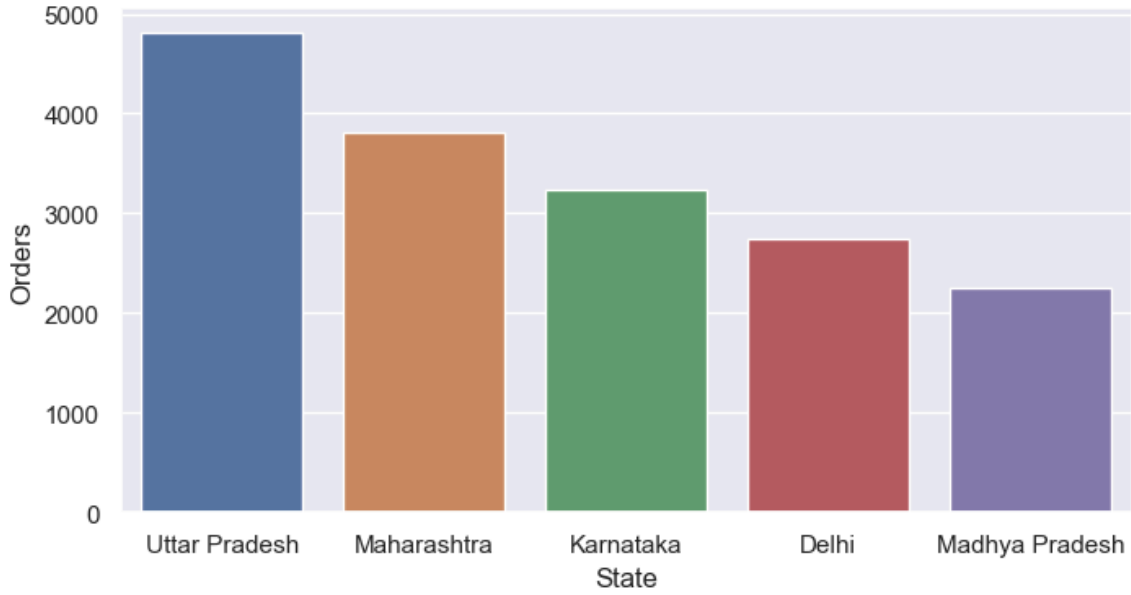


From above graphs we can see that most of the Amount are of age group between 26-35 yrs female

state

In [31]:
```
# total number of orders from top 5 states

sales_state = df.groupby(['State'], as_index = False)['Orders'].sum().sort_v
sns.set(rc={'figure.figsize':(8,4)})
sns.barplot(data = sales_state, x = 'State',y= 'Orders')
```

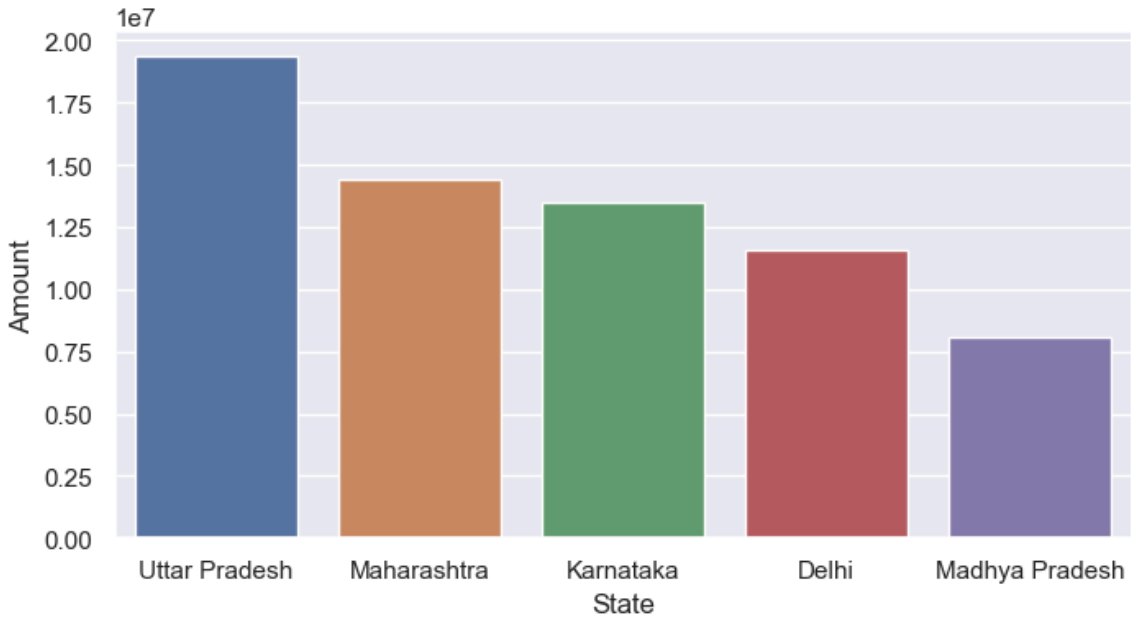
Out[31]: <Axes: xlabel='State', ylabel='Orders'>



From above graphs we can see that highest of the Orders are the State of from Utter Padesh.

In [32]:
```
# total amount/sales from top 5 states

sales_state = df.groupby(['State'], as_index=False)['Amount'].sum().sort_val

sns.set(rc={'figure.figsize':(8,4)})
sns.barplot(data = sales_state, x = 'State',y= 'Amount')
```

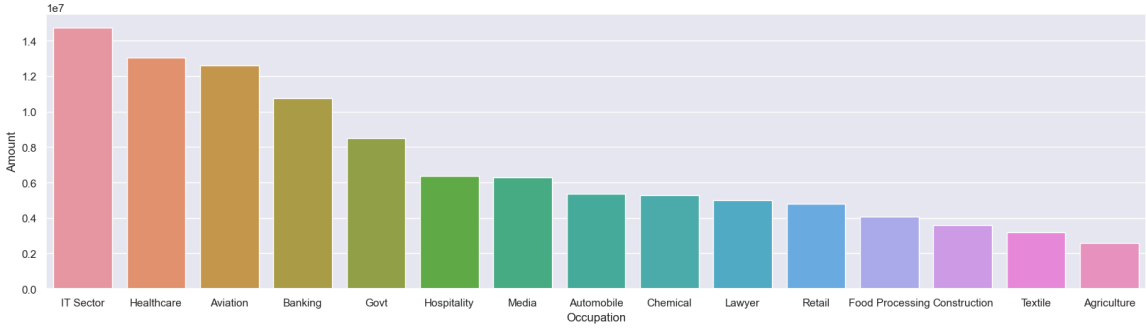
Out[32]: <Axes: xlabel='State', ylabel='Amount'>



From above graphs we can see that most of the orders & total sales/amount are from Uttar Pradesh, Maharashtra and Karnataka respectively

In [33]:
```
# Occupation vs amounts

sales_state = df.groupby(['Occupation'], as_index=False)['Amount'].sum().sor

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

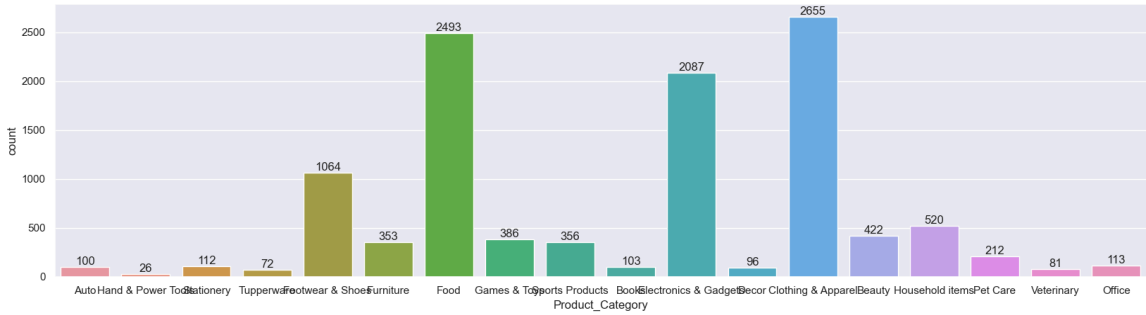
Out[33]:
```
<Axes: xlabel='Occupation', ylabel='Amount'>
```



From above graphs we can see that most of the buyers are working in IT, Healthcare and Aviation sector

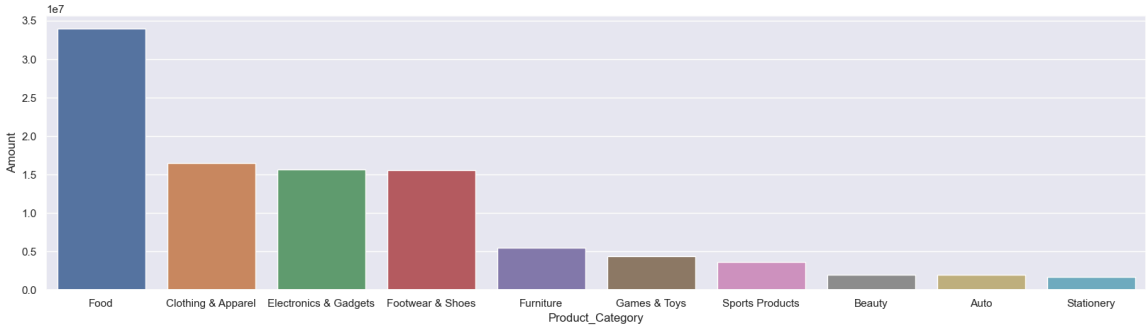
Product Category

In [34]:
```
sns.set(rc={'figure.figsize':(20,5)})
ax = sns.countplot(data = df, x = 'Product_Category')

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



In [35]:
```
sales_state = df.groupby(['Product_Category'], as_index=False)['Amount'].sum

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

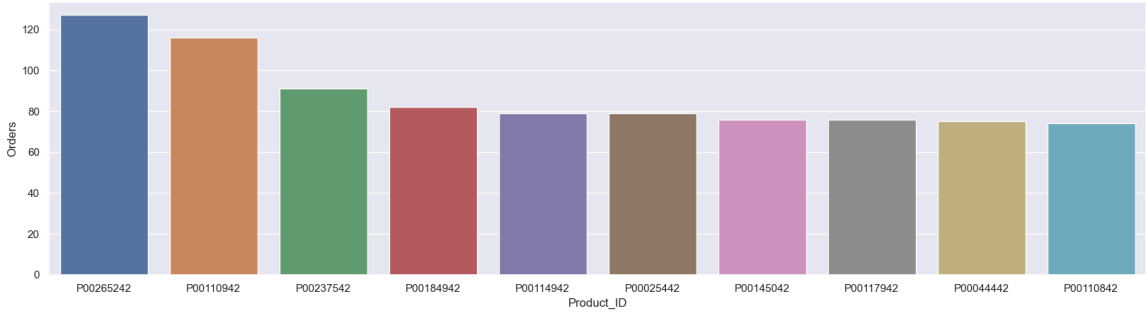
Out[35]:
```
<Axes: xlabel='Product_Category', ylabel='Amount'>
```



From above graphs we can see that most of the sold products are from Food, Clothing and Electronics category

In [36]:
```
sales_state = df.groupby(['Product_ID'], as_index=False)['Orders'].sum().sor

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

Out[36]:
```
<Axes: xlabel='Product_ID', ylabel='Orders'>
```



Conclusion

Married women age group 26-35 yrs from UP, Maharastra and Karnataka working in IT, Healthcare and Aviation are more likely to buy products from Food, Clothing and Electronics category

In [ ]:
```
```