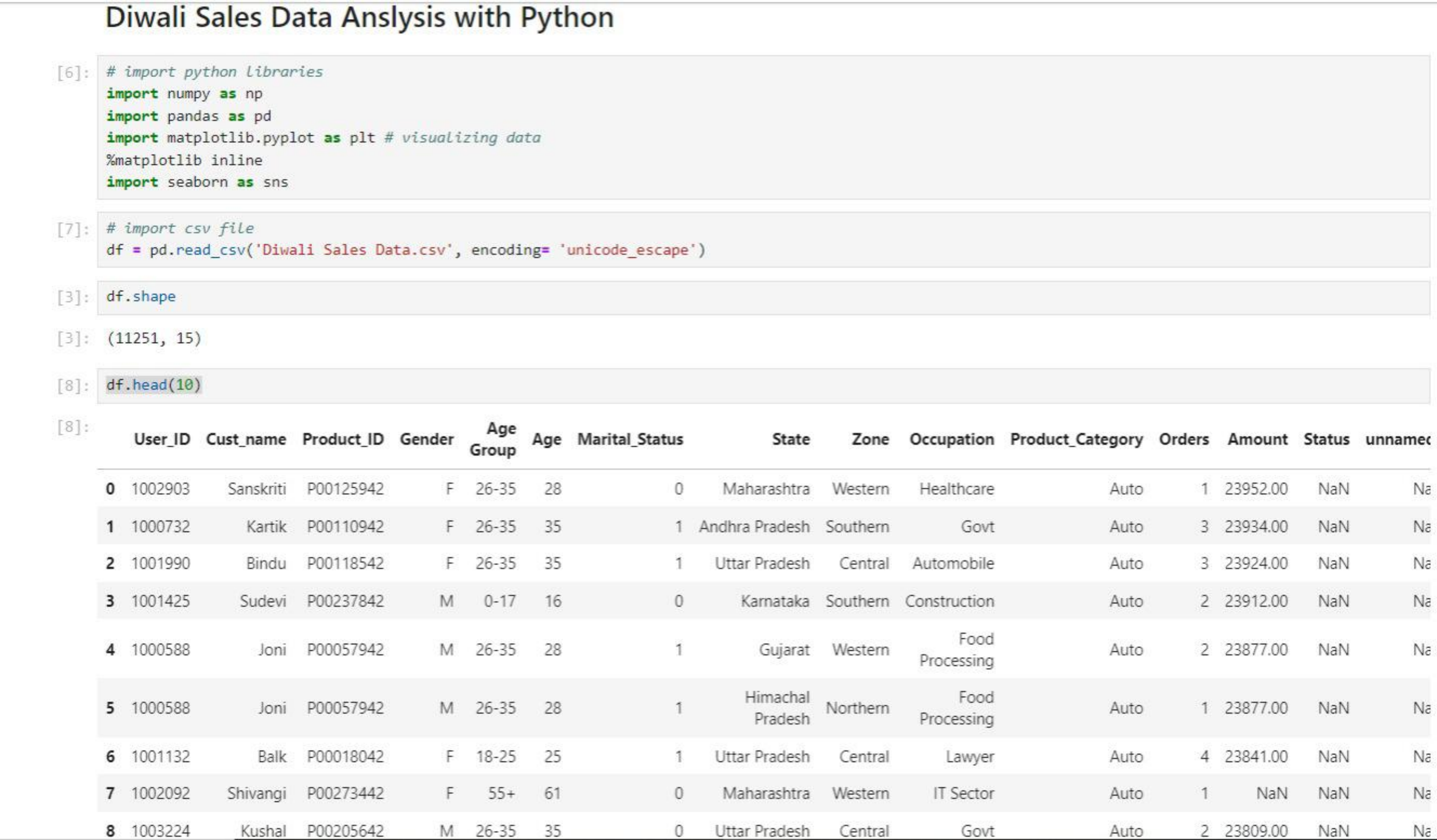


Diwali Sales Data Anslysis with Python

[6]:
```
# import python libraries
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt # visualizing data
%matplotlib inline
import seaborn as sns
```

[7]:
```
# import csv file
df = pd.read_csv('Diwali Sales Data.csv', encoding= 'unicode_escape')
```

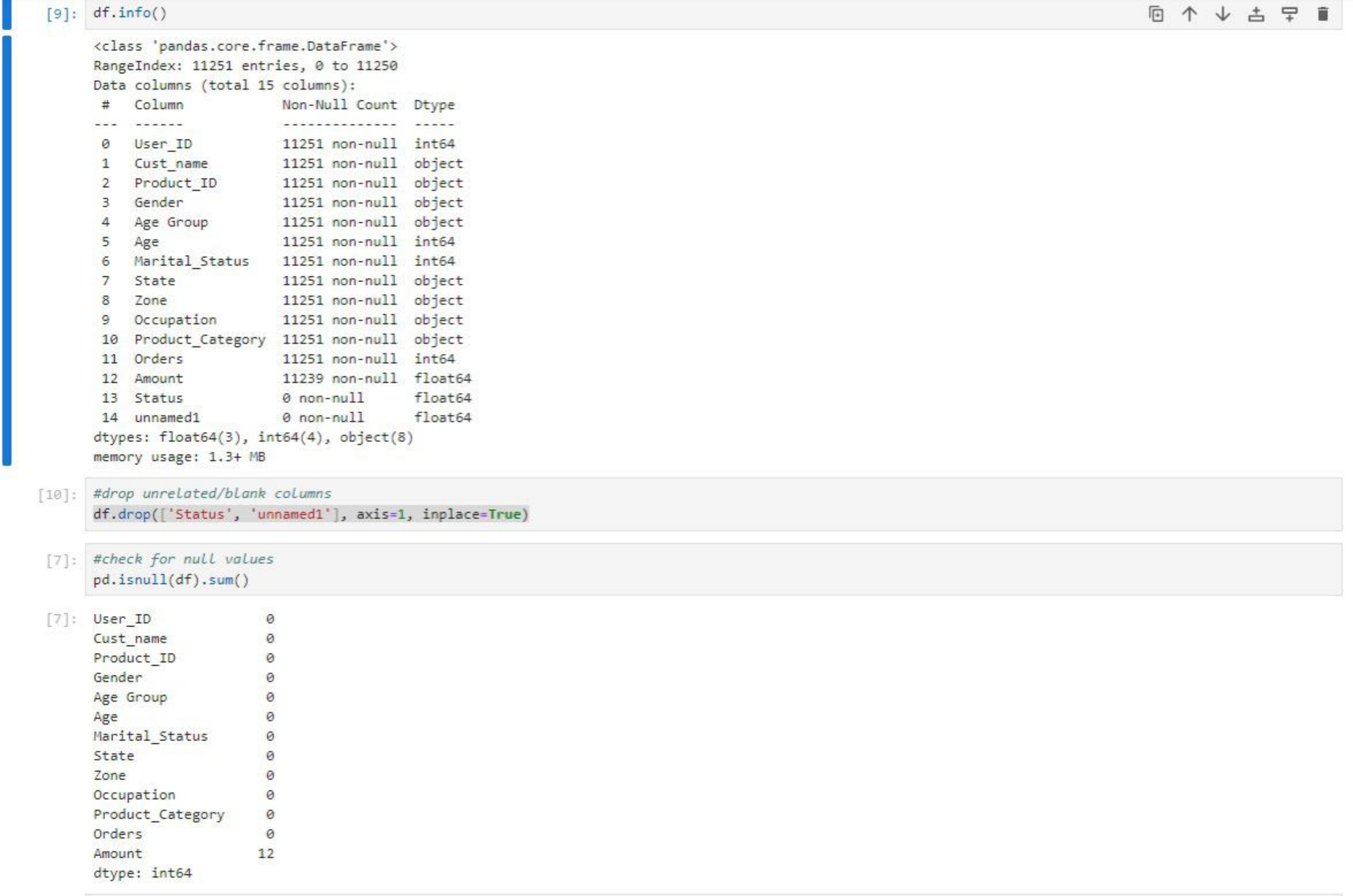
[3]:
```
df.shape
```

[3]:
```
(11251, 15)
```

[8]:
```
df.head(10)
```

[8]:

	User_ID	Cust_name	Product_ID	Gender	Age Group	Age	Marital_Status	State	Zone	Occupation	Product_Category	Orders	Amount	Status	unnamec
0	1002903	Sanskriti	P00125942	F	26-35	28	0	Maharashtra	Western	Healthcare	Auto	1	23952.00	NaN	Na
1	1000732	Kartik	P00110942	F	26-35	35	1	Andhra Pradesh	Southern	Govt	Auto	3	23934.00	NaN	Na
2	1001990	Bindu	P00118542	F	26-35	35	1	Uttar Pradesh	Central	Automobile	Auto	3	23924.00	NaN	Na
3	1001425	Sudevi	P00237842	M	0-17	16	0	Karnataka	Southern	Construction	Auto	2	23912.00	NaN	Na
4	1000588	Joni	P00057942	M	26-35	28	1	Gujarat	Western	Food Processing	Auto	2	23877.00	NaN	Na
5	1000588	Joni	P00057942	M	26-35	28	1	Himachal Pradesh	Northern	Food Processing	Auto	1	23877.00	NaN	Na
6	1001132	Balk	P00018042	F	18-25	25	1	Uttar Pradesh	Central	Lawyer	Auto	4	23841.00	NaN	Na
7	1002092	Shivangi	P00273442	F	55+	61	0	Maharashtra	Western	IT Sector	Auto	1	NaN	NaN	Na
8	1003224	Kushal	P00205642	M	26-35	35	0	Uttar Pradesh	Central	Govt	Auto	2	23809.00	NaN	Na



[9]:

```
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
```

[10]:

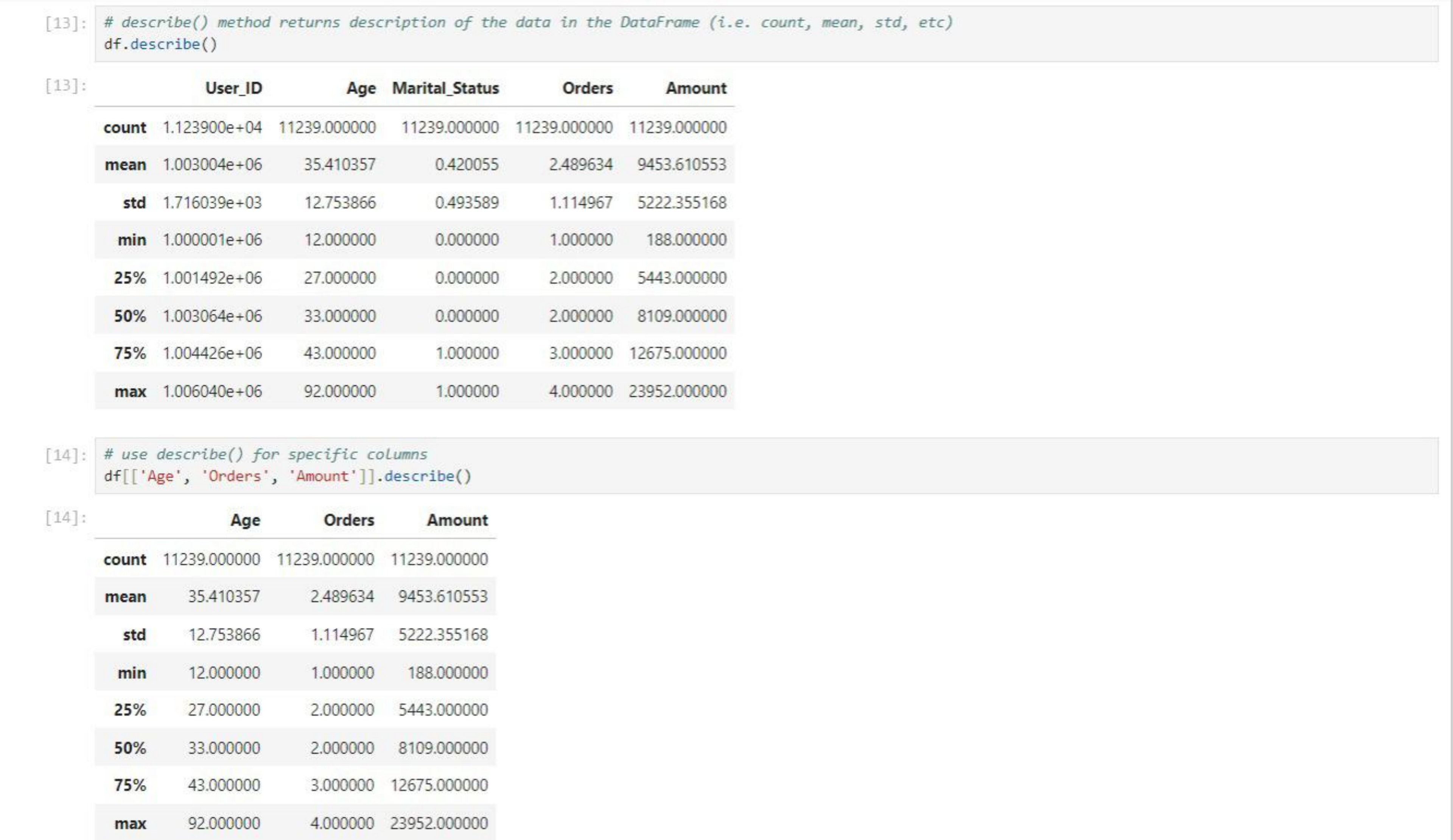
```
#drop unrelated/blank columns
df.drop(['Status', 'unnamed1'], axis=1, inplace=True)
```

[7]:

```
#check for null values
pd.isnull(df).sum()
```

[7]:

```
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
```



[13]:

```
# describe() method returns description of the data in the DataFrame (i.e. count, mean, std, etc)
df.describe()
```

[13]:

	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

[14]:

```
# use describe() for specific columns
df[['Age', 'Orders', 'Amount']].describe()
```

[14]:

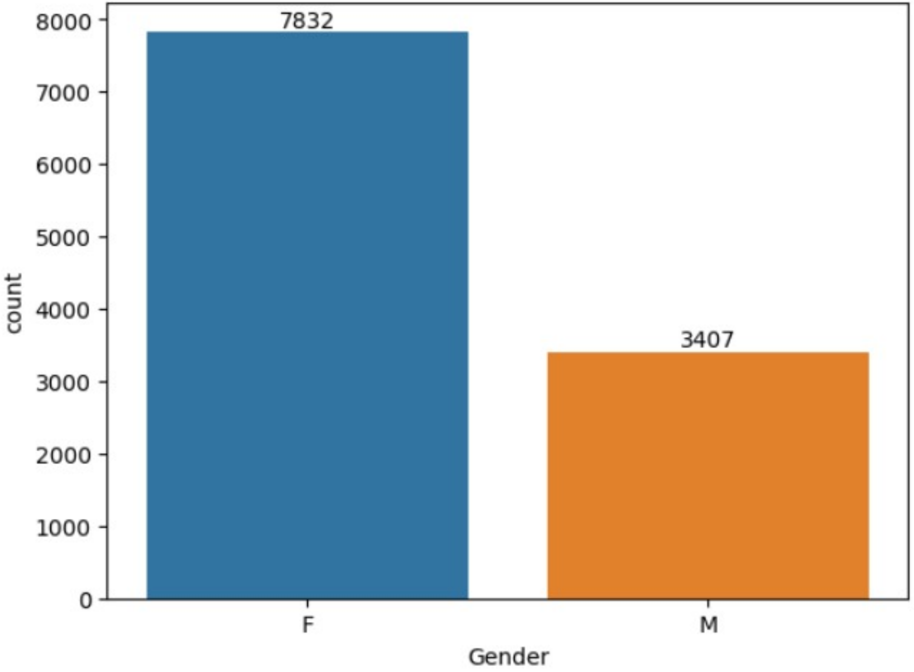
	Age	Orders	Amount
count	11239.000000	11239.000000	11239.000000
mean	35.410357	2.489634	9453.610553
std	12.753866	1.114967	5222.355168
min	12.000000	1.000000	188.000000
25%	27.000000	2.000000	5443.000000
50%	33.000000	2.000000	8109.000000
75%	43.000000	3.000000	12675.000000
max	92.000000	4.000000	23952.000000

Exploratory Data Analysis

Gender

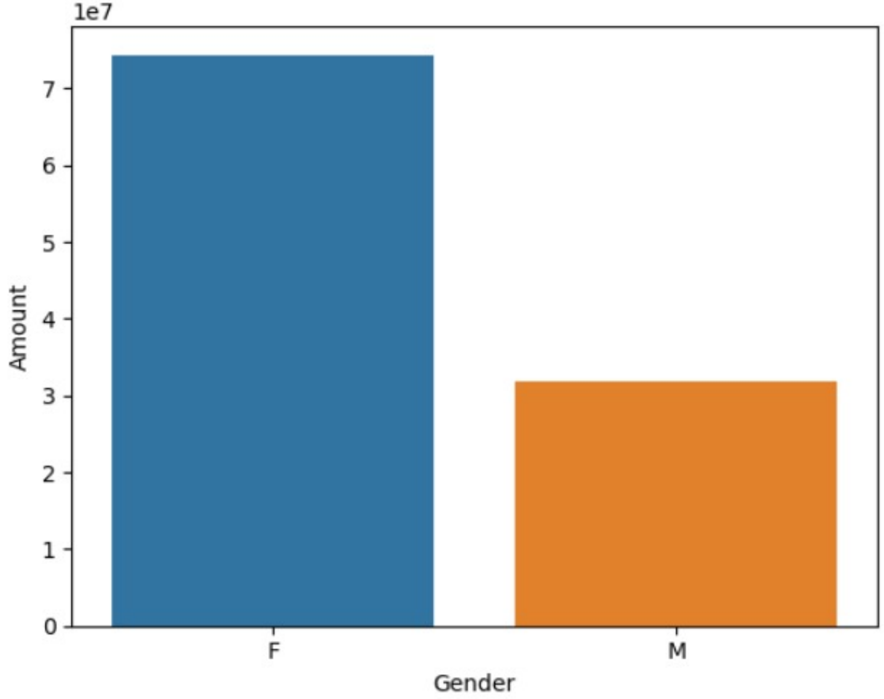
[15]:

```python
# plotting a bar chart for Gender and it's count

ax = sns.countplot(x = 'Gender',data = df)

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



```
[16]: # plotting a bar chart for gender vs total amount

      sales_gen = df.groupby(['Gender'], as_index=False)['Amount'].sum().sort_values(by='Amount', ascending=False)

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

```
[16]: <Axes: xlabel='Gender', ylabel='Amount'>
```

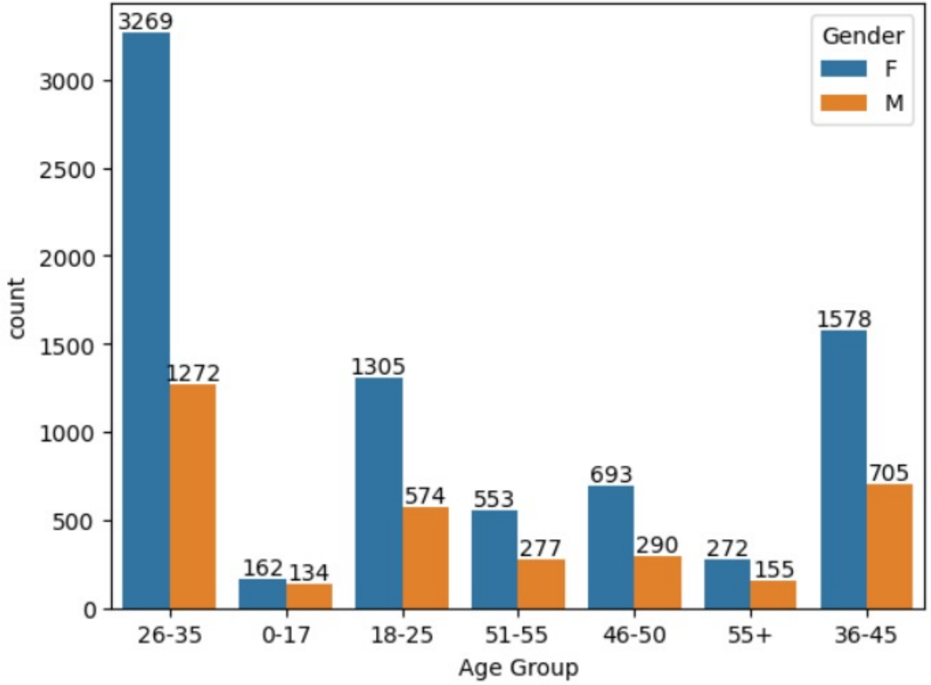


From above graphs we can see that most of the buyers are females and even the purchasing power of females are greater than men

Age

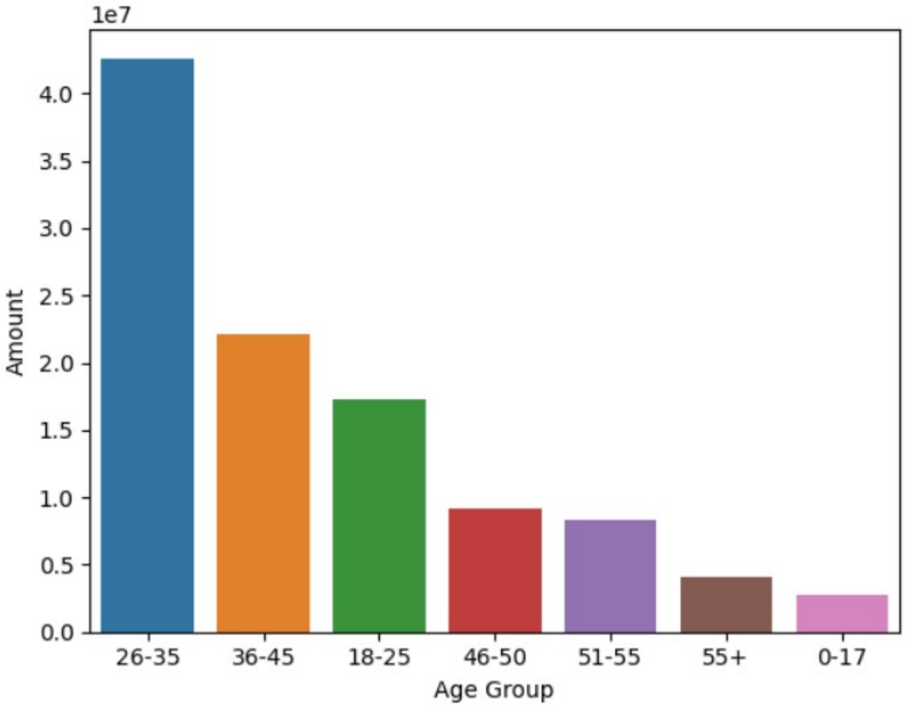
[17]:

```
ax = sns.countplot(data = df, x = 'Age Group', hue = 'Gender')

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



```
[18]: # Total Amount vs Age Group
      sales_age = df.groupby(['Age Group'], as_index=False)['Amount'].sum().sort_values(by='Amount', ascending=False)

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

```
[18]: <Axes: xlabel='Age Group', ylabel='Amount'>
```

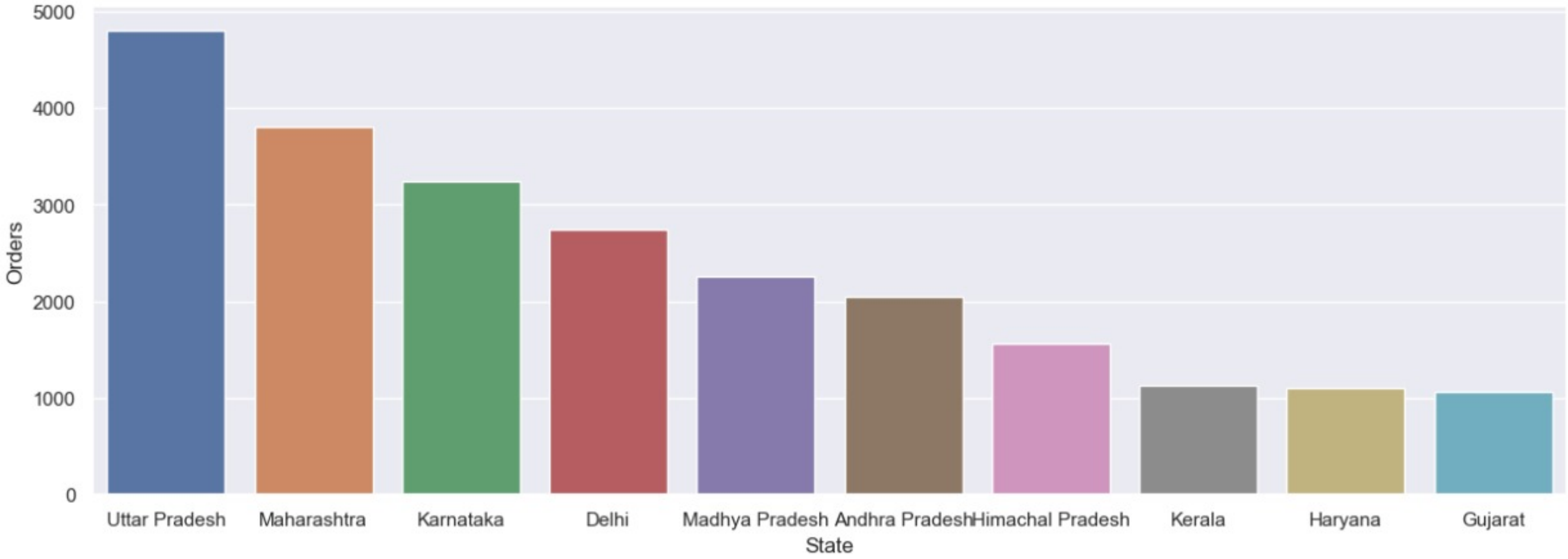


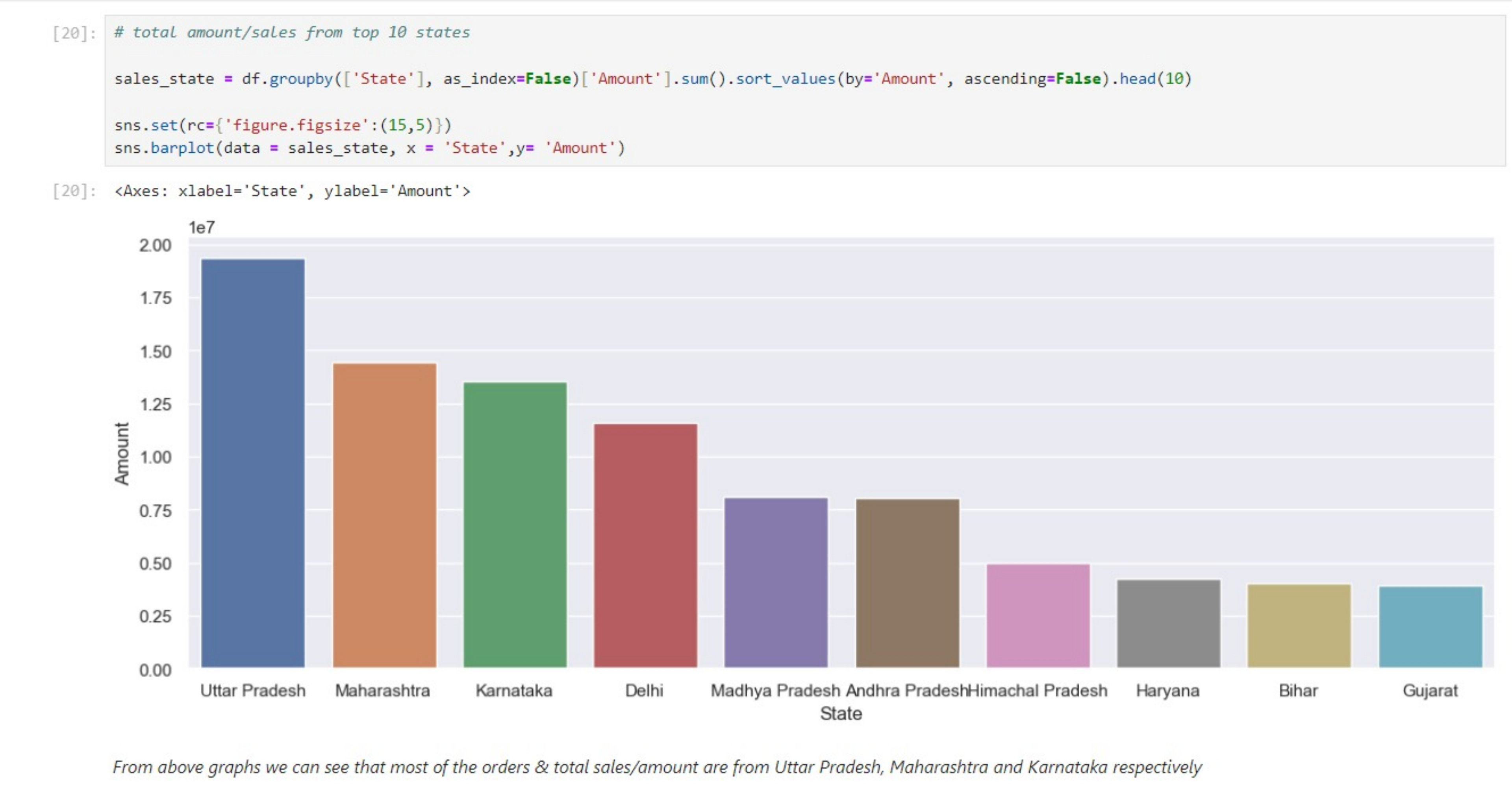
From above graphs we can see that most of the buyers are of age group between 26-35 yrs female

State

```
[19]: # total number of orders from top 10 states

      sales_state = df.groupby(['State'], as_index=False)['Orders'].sum().sort_values(by='Orders', ascending=False).head(10)

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

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





```
[20]: # total amount/sales from top 10 states

      sales_state = df.groupby(['State'], as_index=False)['Amount'].sum().sort_values(by='Amount', ascending=False).head(10)

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

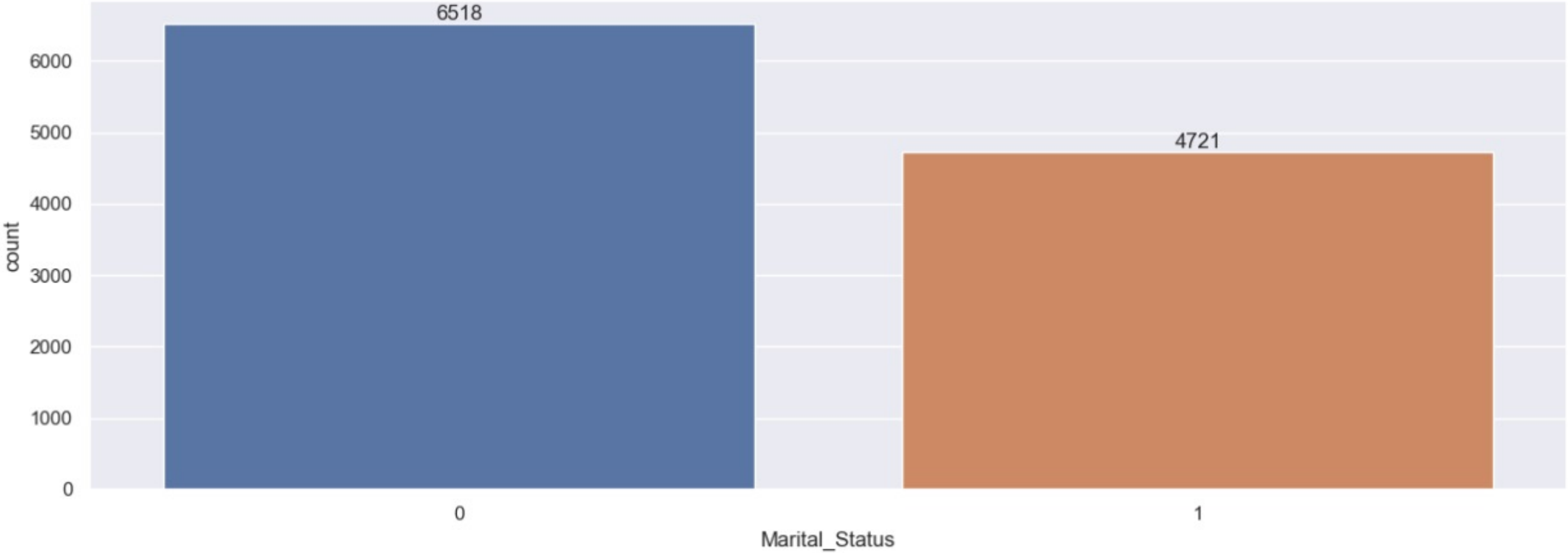
```
[20]: <Axes: xlabel='State', ylabel='Amount'>
```

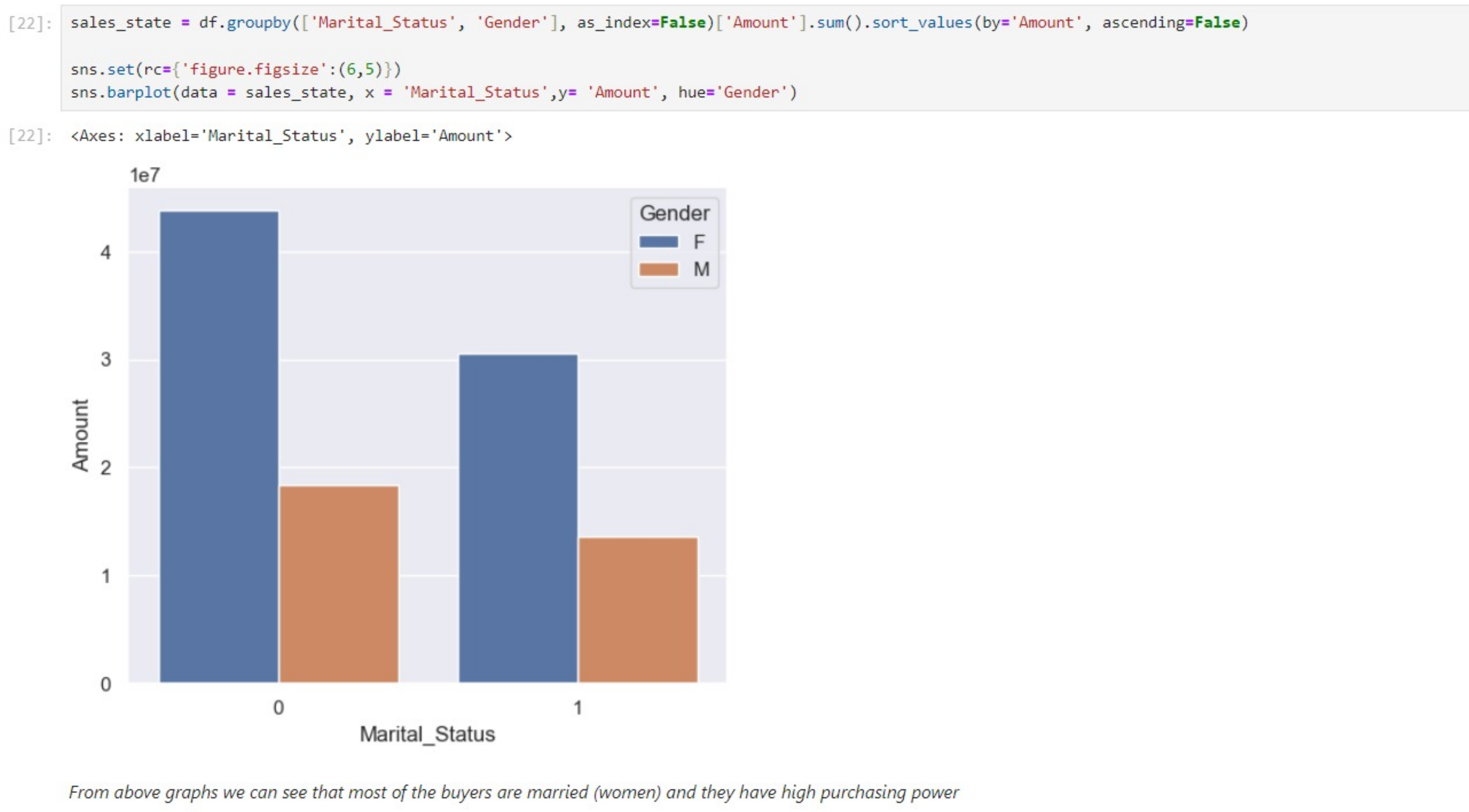
From above graphs we can see that most of the orders & total sales/amount are from Uttar Pradesh, Maharashtra and Karnataka respectively

Marital Status

[21]:

```
ax = sns.countplot(data = df, x = 'Marital_Status')

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





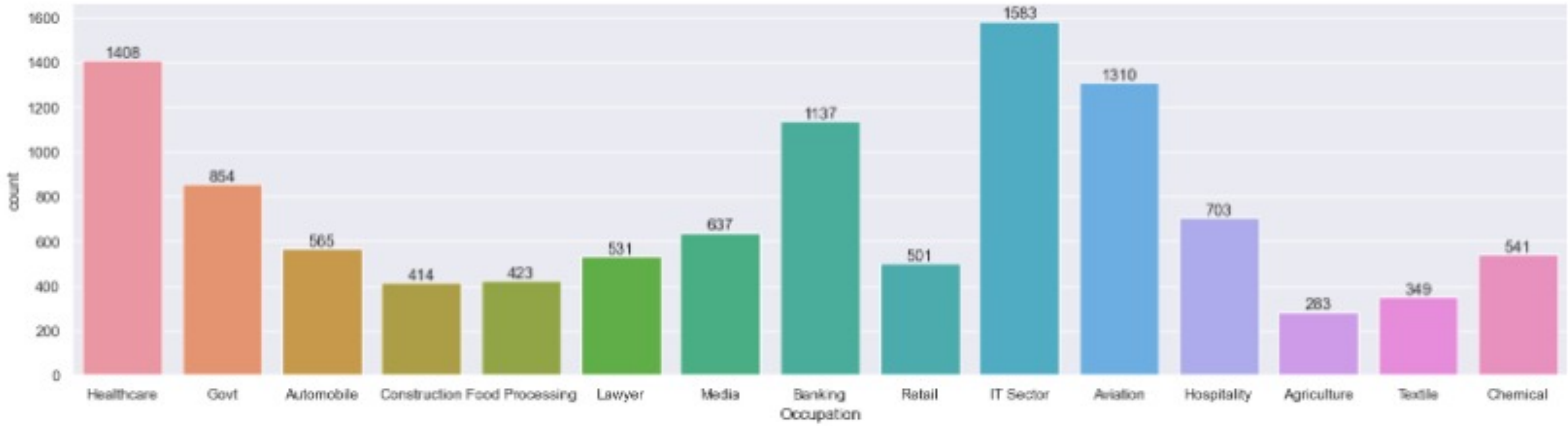
```
[22]: sales_state = df.groupby(['Marital_Status', 'Gender'], as_index=False)['Amount'].sum().sort_values(by='Amount', ascending=False)

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

```
[22]: <Axes: xlabel='Marital_Status', ylabel='Amount'>
```

From above graphs we can see that most of the buyers are married (women) and they have high purchasing power

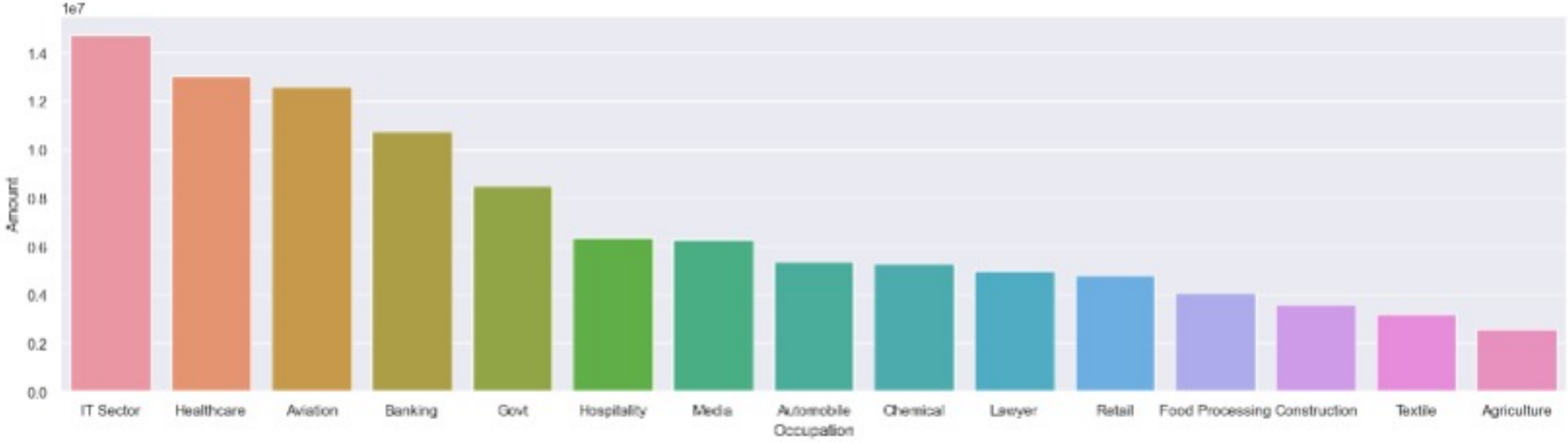
Occupation

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

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



```
[24]: sales_state = df.groupby(['Occupation'], as_index=False)['Amount'].sum().sort_values(by='Amount', ascending=False)

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

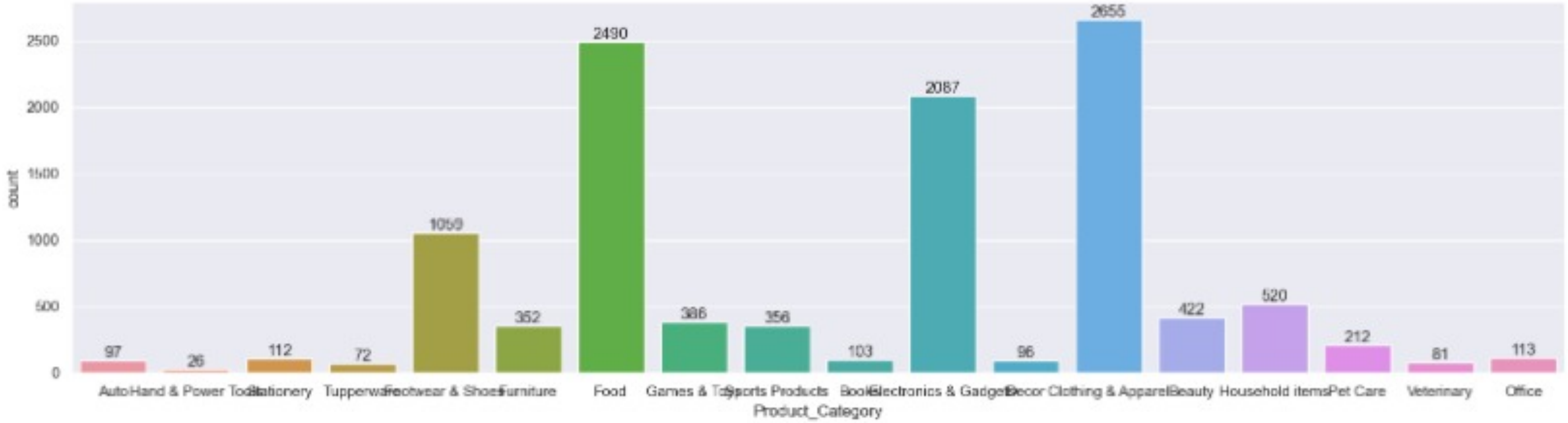
```
[24]: <Axes: xlabel='Occupation', ylabel='Amount'>
```



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

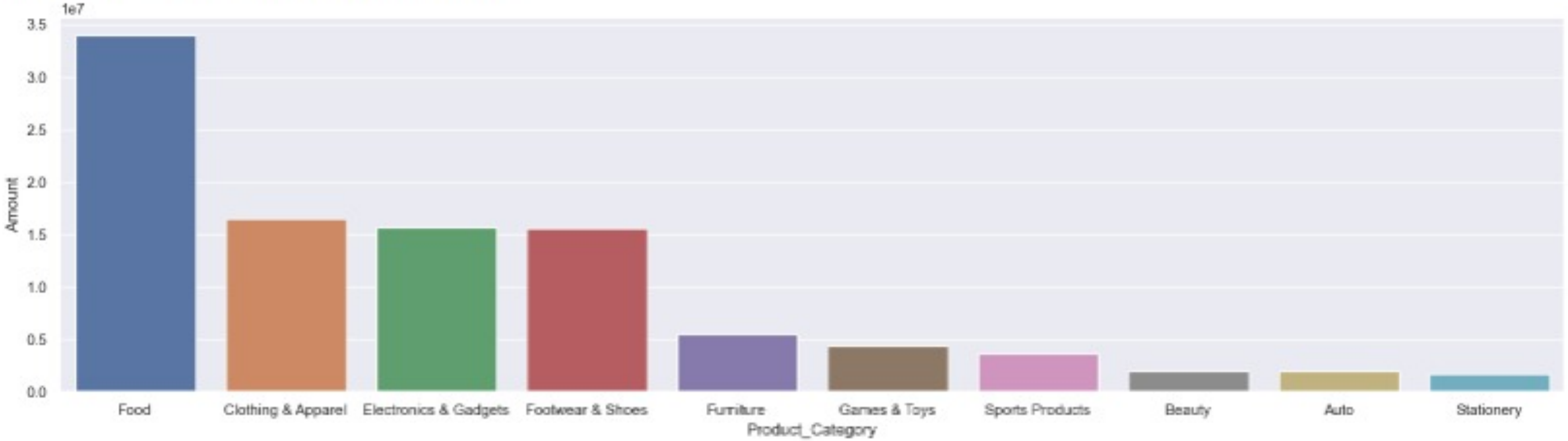
Product Category

[25]:
```
sns.set(rc={'figure.figsize':(20,5)})
ax = sns.countplot(data = df, x = 'Product_Category')

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

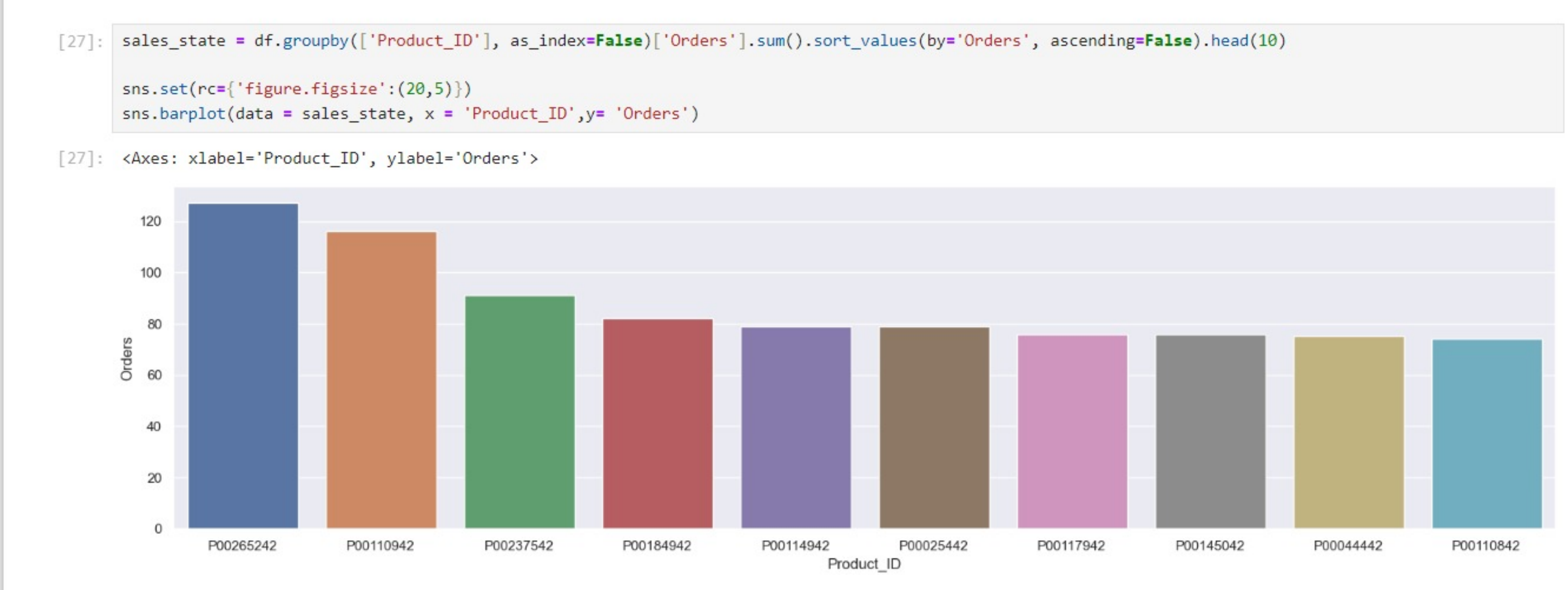


[26]:
```
sales_state = df.groupby(['Product_Category'], as_index=False)['Amount'].sum().sort_values(by='Amount', ascending=False).head(10)

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

[26]:
```
<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

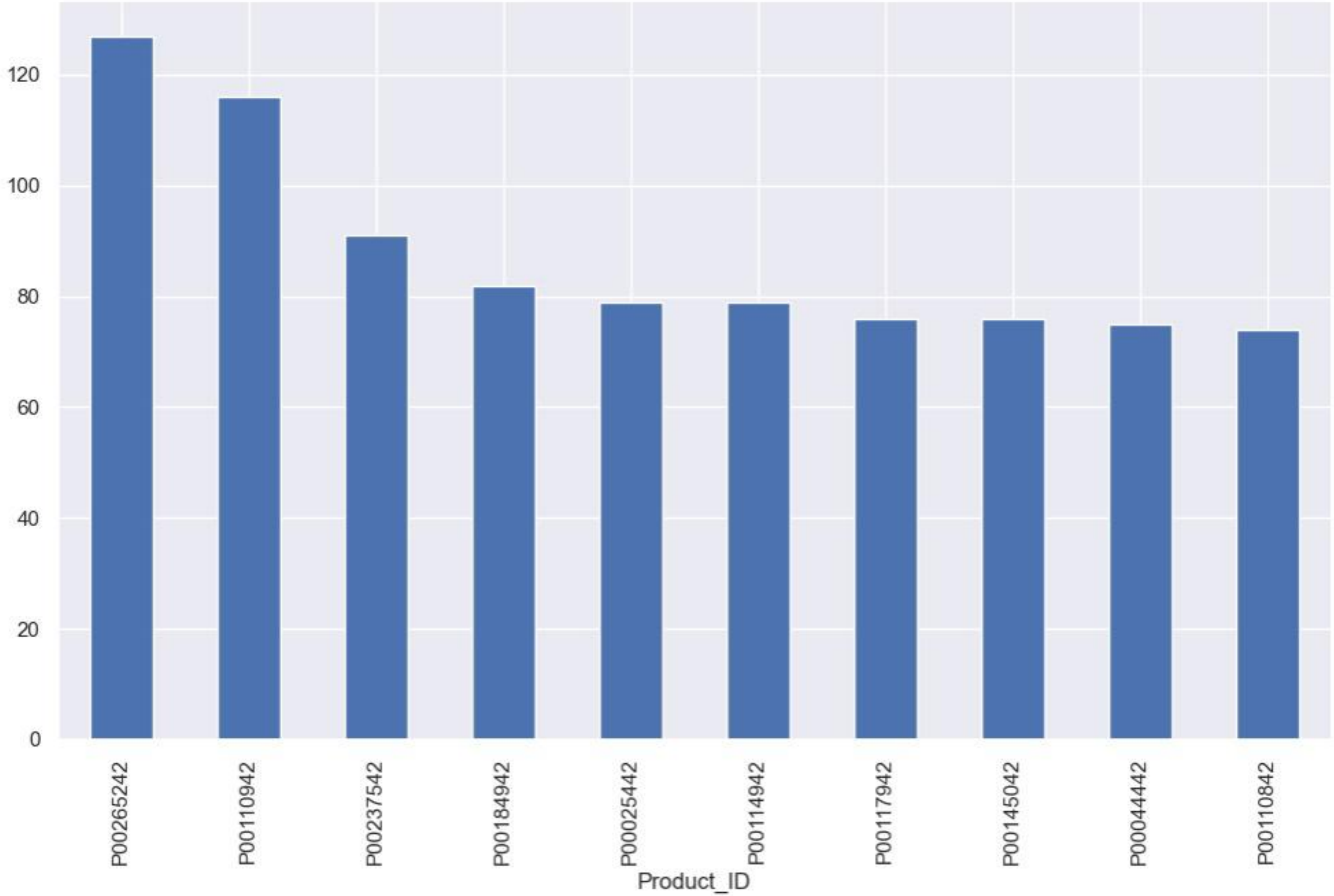


```
[27]: sales_state = df.groupby(['Product_ID'], as_index=False)['Orders'].sum().sort_values(by='Orders', ascending=False).head(10)

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

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

```
[28]: # top 10 most sold products (same thing as above)

      fig1, ax1 = plt.subplots(figsize=(12,7))
      df.groupby('Product_ID')['Orders'].sum().nlargest(10).sort_values(ascending=False).plot(kind='bar')
```

```
[28]: <Axes: xlabel='Product_ID'>
```


P00265242
P00110942
P00237542
P00184942
P00025442
P00114942
P00117942
P00145042
P00044442
P00110842
Product_ID