In [ ]:

```
# import python libraries
#%matplotlib is used to ensure that the plots are showed up within this window only
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt # visualizing data
%matplotlib inline
import seaborn as sns
```

In [ ]:

```
# import csv file, we have used r so than slashes and underscores are used as liter
df = pd.read_csv(r'c:\Users\Dell\Downloads\Python_Diwali_Sales_Analysis-main\Diwali
```

In [ ]:

```
df.head(10)
```

Out[ ]:

	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
5	1000588	Joni	P00057942	M	26-35	28	1	Himachal Pradesh
6	1001132	Balk	P00018042	F	18-25	25	1	Uttar Pradesh
7	1002092	Shivangi	P00273442	F	55+	61	0	Maharashtra
8	1003224	Kushal	P00205642	M	26-35	35	0	Uttar Pradesh
9	1003650	Ginny	P00031142	F	26-35	26	1	Andhra Pradesh

In [ ]:

```
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
```

DATA CLEANING

In [ ]:

```
#Data Cleaning ,Remove empty columns
df.drop(['Status','unnamed1'], axis=1,inplace=True)
```

In [ ]:

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

Out[ ]:

```
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 [ ]:

```
#Delet all the null values
df.dropna(inplace=True)
```

In [ ]:

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

In [ ]:

```
df['Amount'].dtype
```

Out[ ]:

```
dtype('int32')
```

In [ ]:

```
df.columns
```

Out[ ]:

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

In [ ]:

```
df.describe()
```

Out[ ]:

	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 [ ]:

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

Out[ ]:

	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

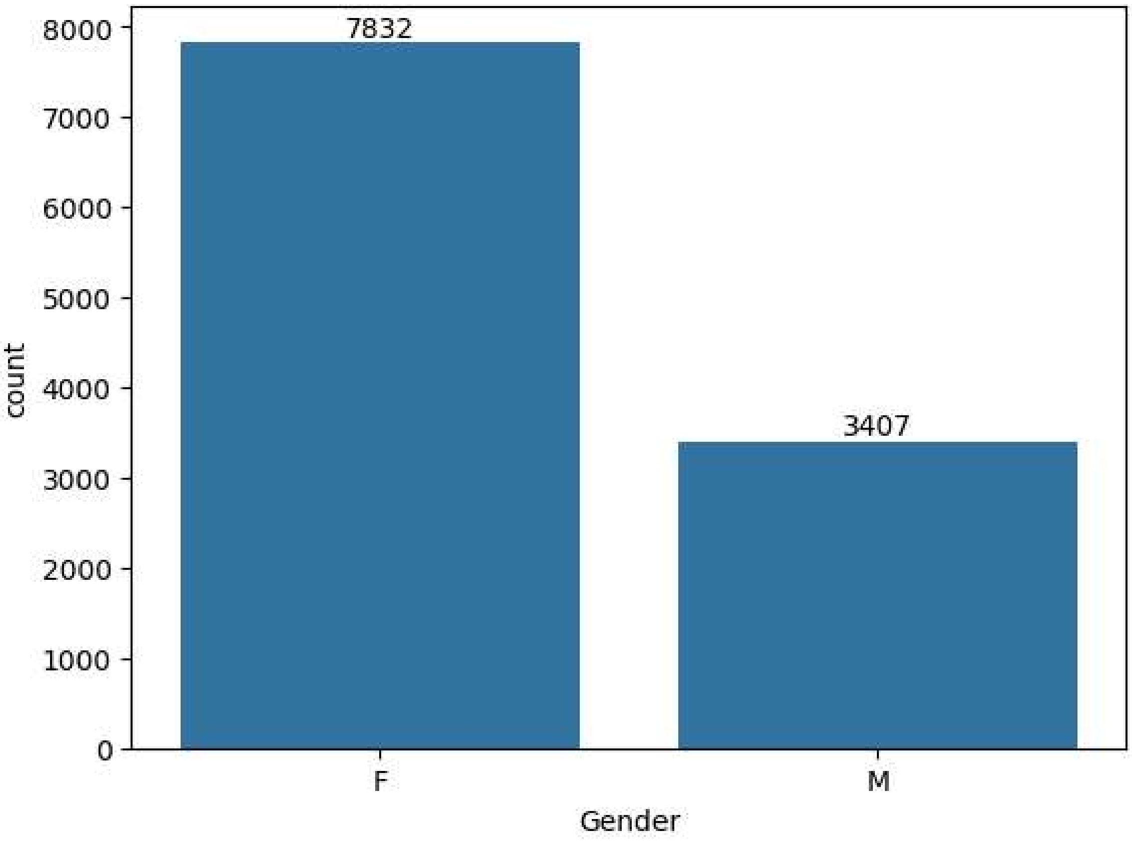
DATA ANALYSIS

GENDER:

In [ ]:

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

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

```
for bars in ax.containers:# for each bar label is added
    ax.bar_label(bars)
```

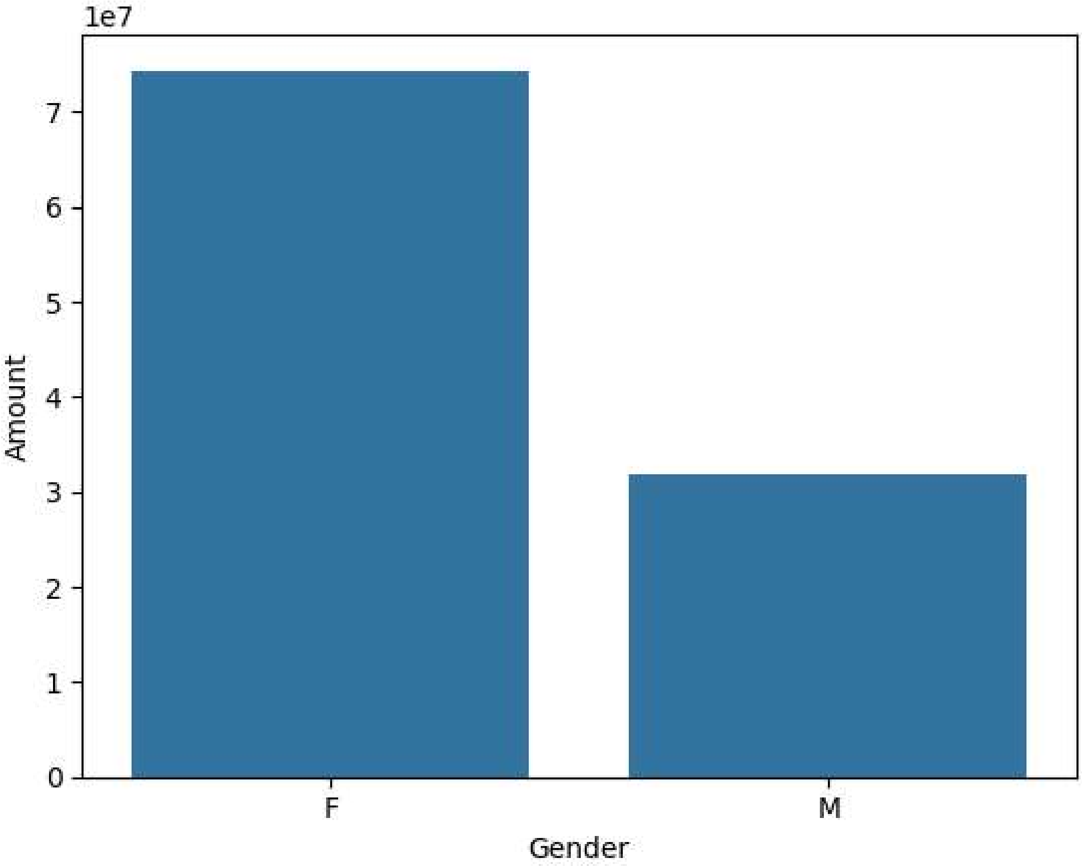


In [ ]:

```
# plotting a bar chart for gender vs total amount

sales_gen = df.groupby(['Gender'], as_index=False)['Amount'].sum().sort_values(by='
#as_index is set to false so that the grouped columns are not used as index
sns.barplot(x = 'Gender',y= 'Amount' ,data = sales_gen)
```

Out[ ]:

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

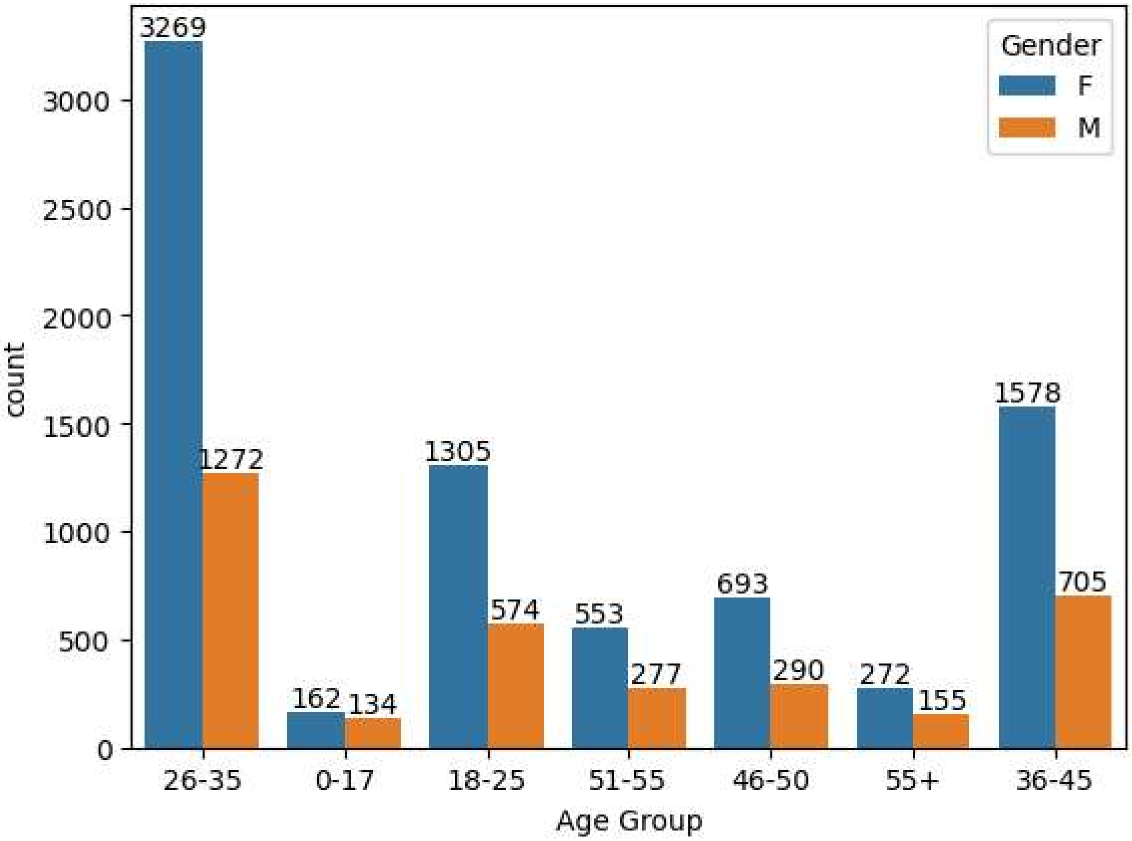


From above graphs we can see that most of the buyers are females and even the purchasing power of females are greater than men

AGE

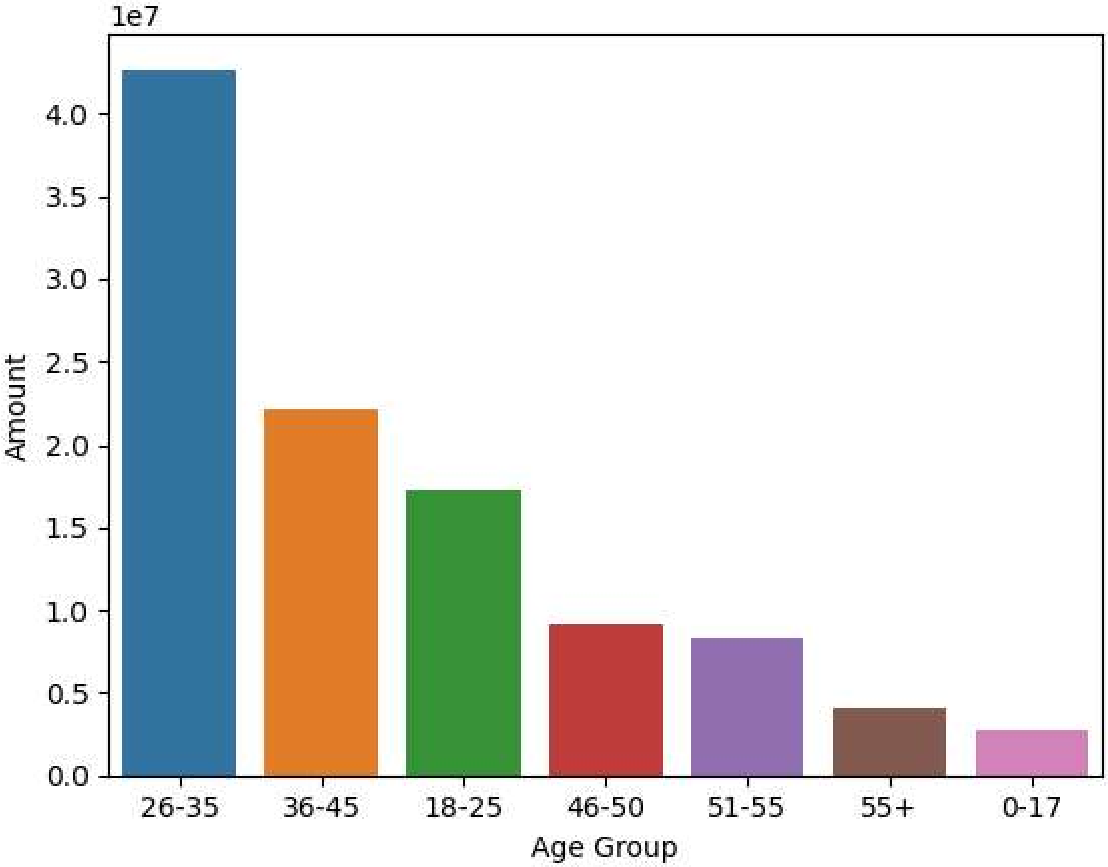
In [ ]:

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

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



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

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

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

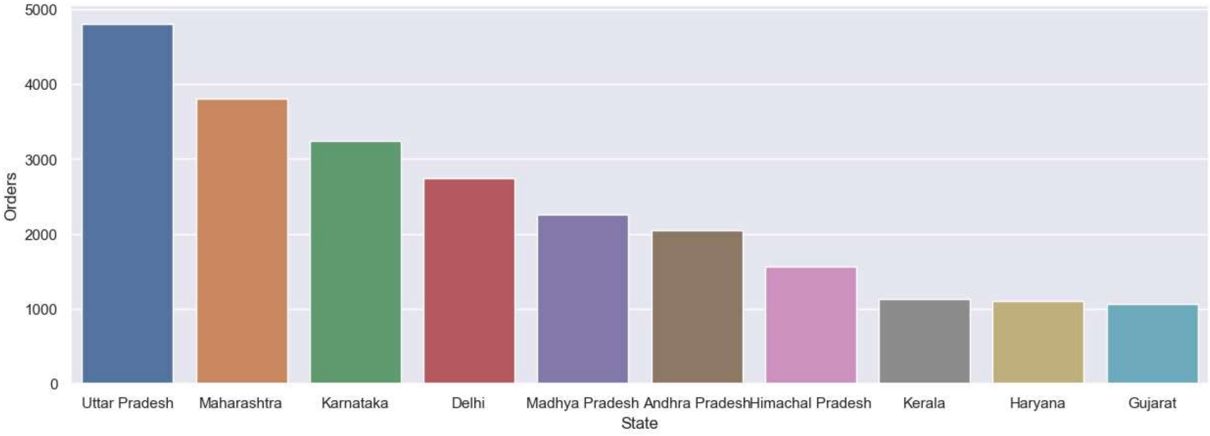


From above graphs we can see that most of the buyers are of age group between 26-35 yrs female

State

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

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

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

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

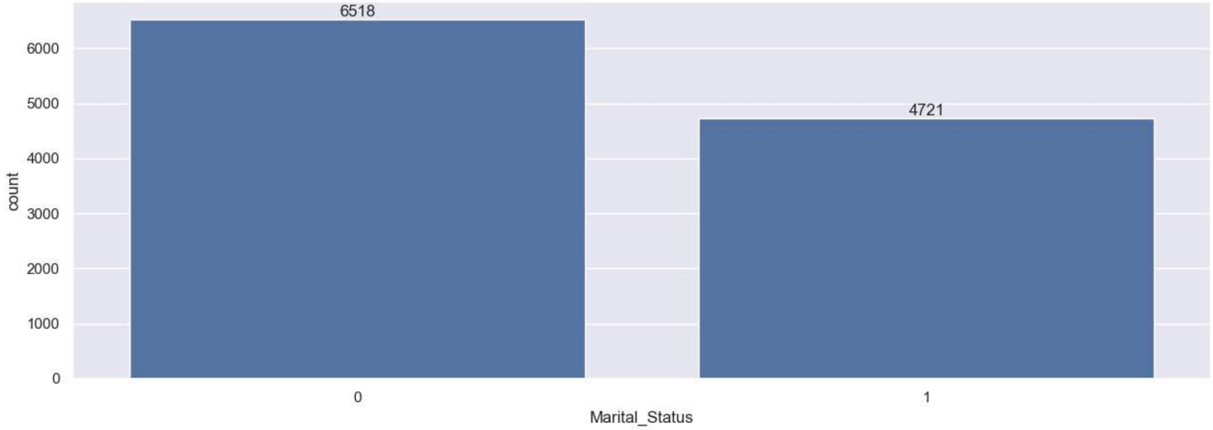


From above graphs we can see that most of the orders & total sales/amount are from Uttar Pradesh, Maharashtra and Karnataka respectively

Marital Status

In [ ]:

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

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

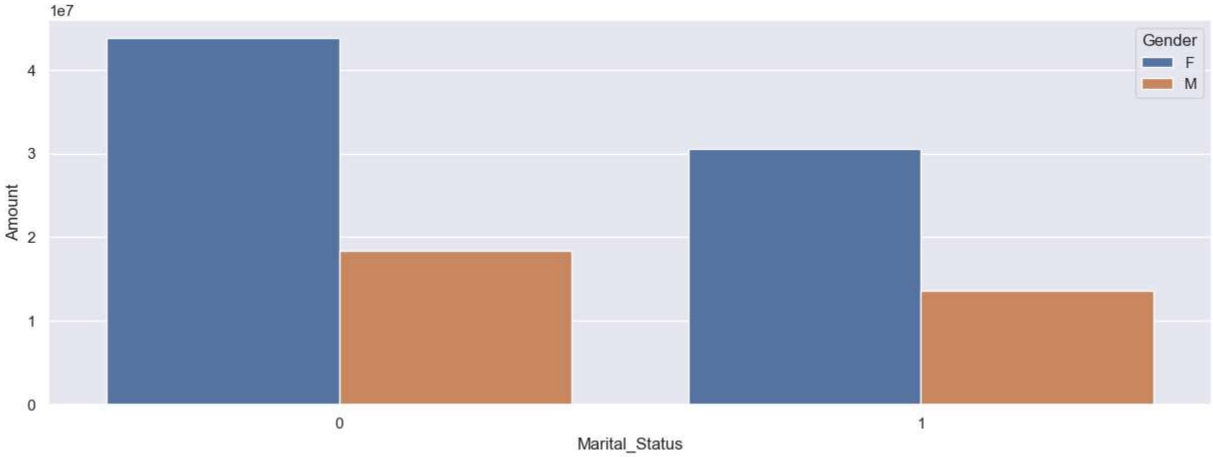


In [ ]:

```
sales_state = df.groupby(['Marital_Status', 'Gender'], as_index=False)['Amount'].su
#Sum of amount is calculated for each combination of marital status and gender
#sns.set(rc={'figure.figsize':(6,5)})
sns.barplot(data = sales_state, x = 'Marital_Status',y= 'Amount', hue='Gender')
```

Out[ ]:

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



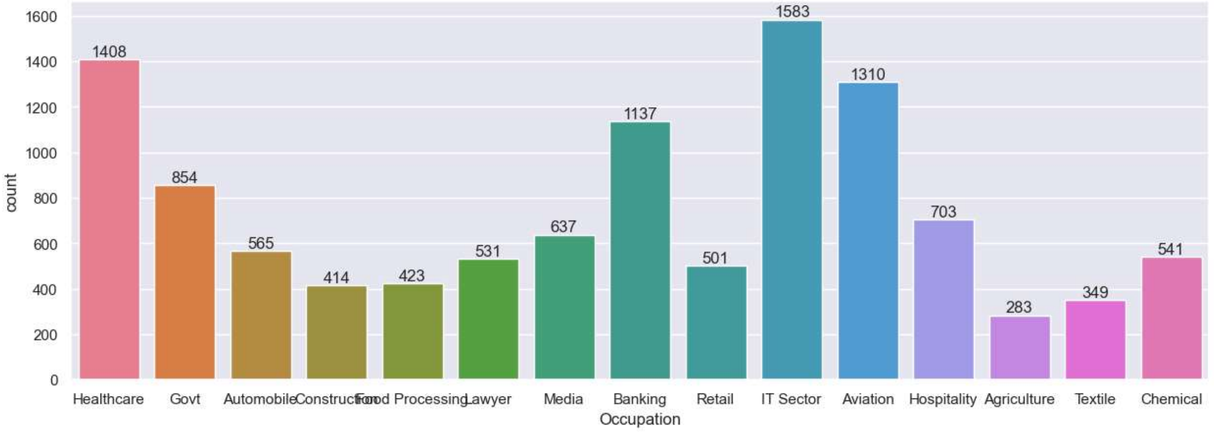
From above graphs we can see that most of the buyers are married (women) and they have high purchasing power

Occupation

In [ ]:

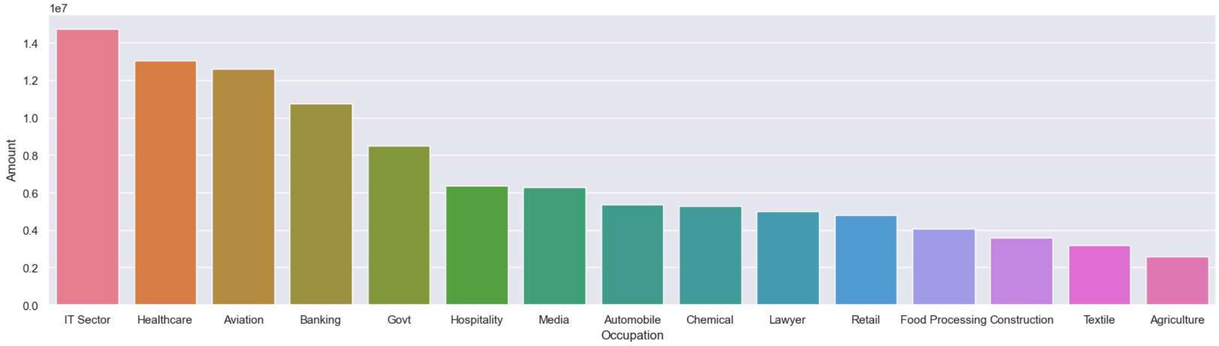
```
#sns.set(rc={'figure.figsize':(20,5)})
ax = sns.countplot(data = df, x = 'Occupation',hue='Occupation')
```

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



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

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

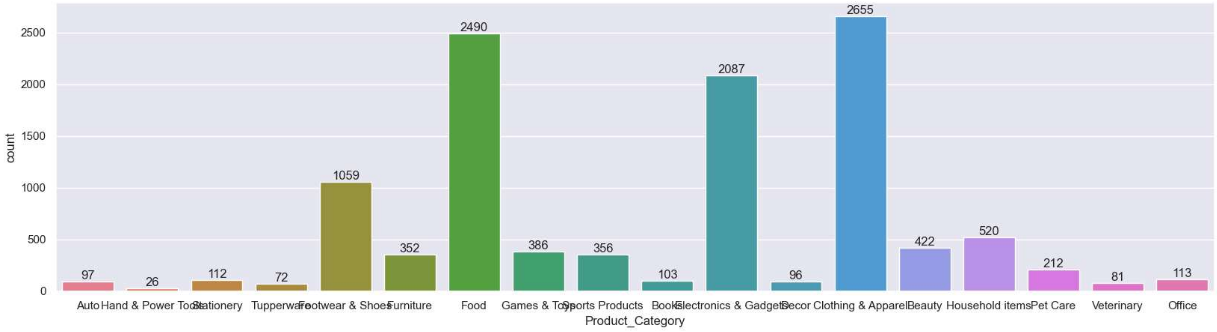
```
Out[ ]: <Axes: xlabel='Occupation', ylabel='Amount'>
```



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

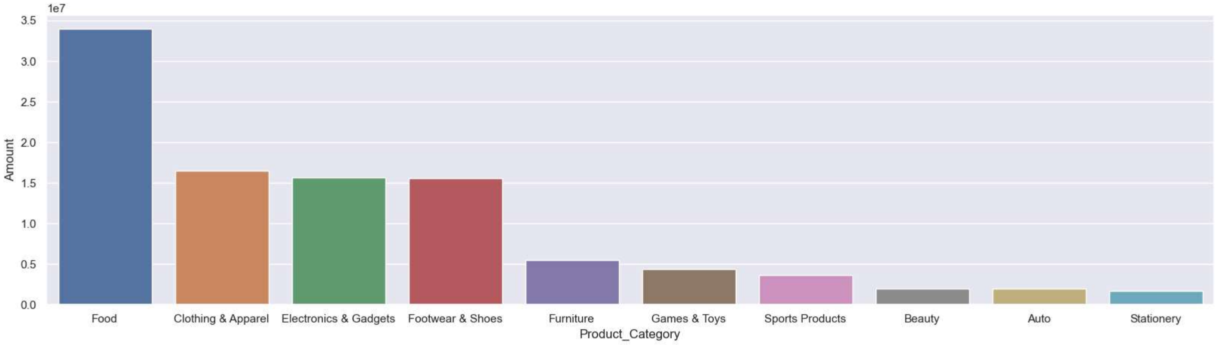
Product Category

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

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



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

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

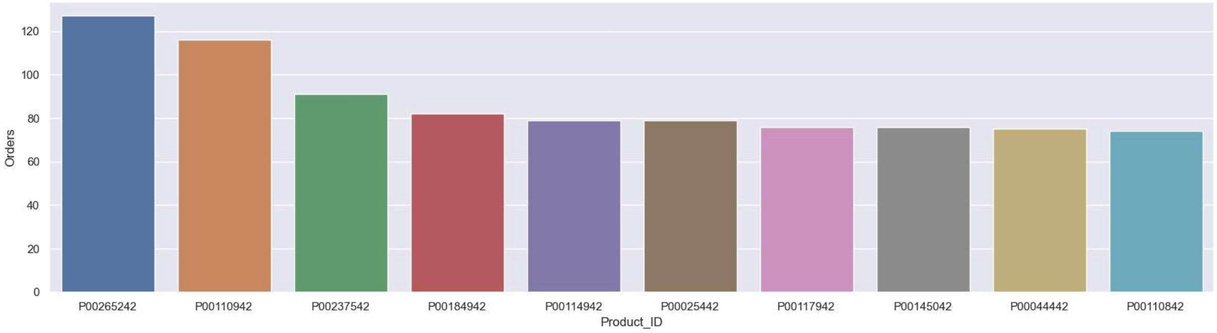
Out[ ]:
```
<Axes: xlabel='Product_Category', ylabel='Amount'>
```



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

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

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

Out[ ]:
```
<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

THANK YOU!