```python
# importing requried libraries :

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

# import csv file
df = pd.read_csv('Diwali Sales Data.csv', encoding= 'unicode_escape')
#View few rows
df.head()
```

```
   User_ID  Cust_name Product_ID Gender Age Group  Age  Marital_Status
\
0  1002903  Sanskriti  P00125942      F     26-35   28               0

1  1000732     Kartik  P00110942      F     26-35   35               1

2  1001990      Bindu  P00118542      F     26-35   35               1

3  1001425     Sudevi  P00237842      M      0-17   16               0

4  1000588       Joni  P00057942      M     26-35   28               1


            State      Zone       Occupation Product_Category  Orders
\
0     Maharashtra   Western       Healthcare             Auto       1

1  Andhra Pradesh  Southern             Govt             Auto       3

2   Uttar Pradesh   Central       Automobile             Auto       3

3       Karnataka  Southern     Construction             Auto       2

4         Gujarat   Western  Food Processing             Auto       2


    Amount  Status  unnamed1
0  23952.0     NaN       NaN
1  23934.0     NaN       NaN
2  23924.0     NaN       NaN
3  23912.0     NaN       NaN
4  23877.0     NaN       NaN
```

```python
df.shape
```

```
(11251, 15)
```

```
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
```

```
#remove unwanted column
df.drop(['Status', 'unnamed1'], axis=1, inplace=True)
```

```
#taking the total of null values in each column
df.isnull().sum()
```

```
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
```

```
# drop null values
df.dropna(inplace=True)
```

```
# change data type
df['Amount'] = df['Amount'].astype('int')
```

```
df['Amount'].dtypes
```

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

```
df.columns
```

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

```
df.describe()
```

```
            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
```

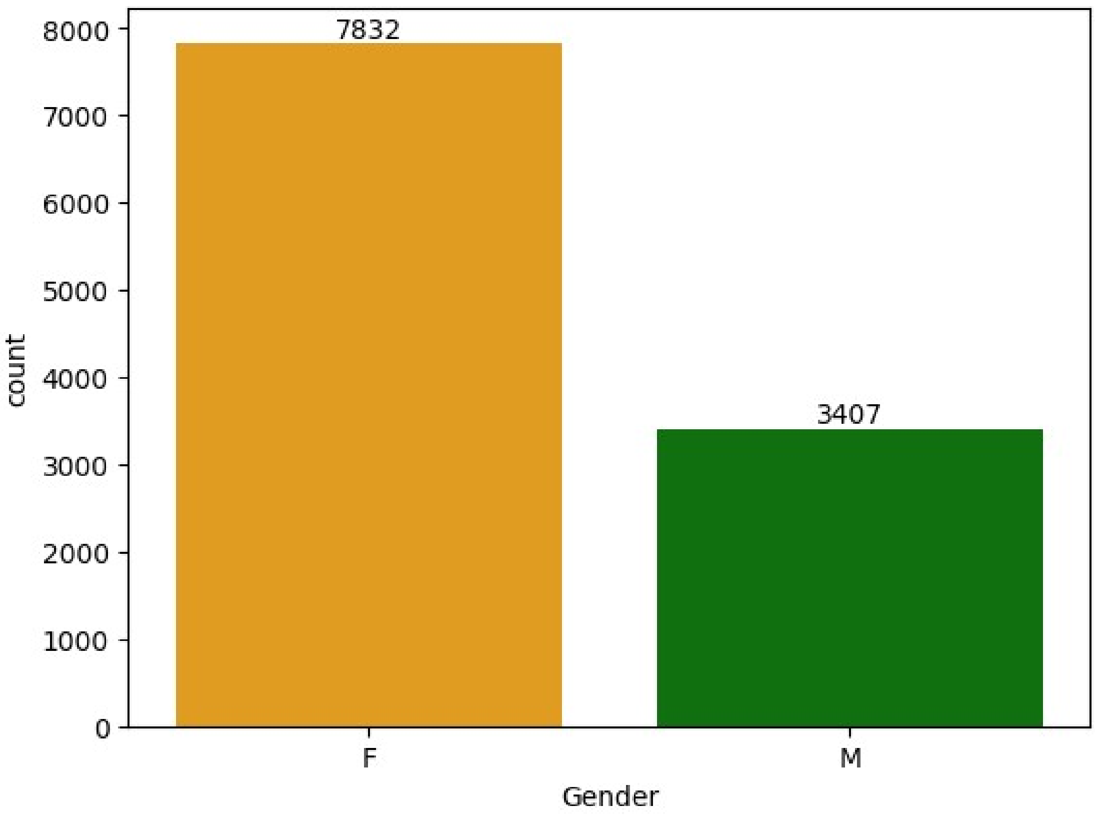
```
# use describe() for specific columns
df[['Age', 'Orders', 'Amount']].describe()
```

```
                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

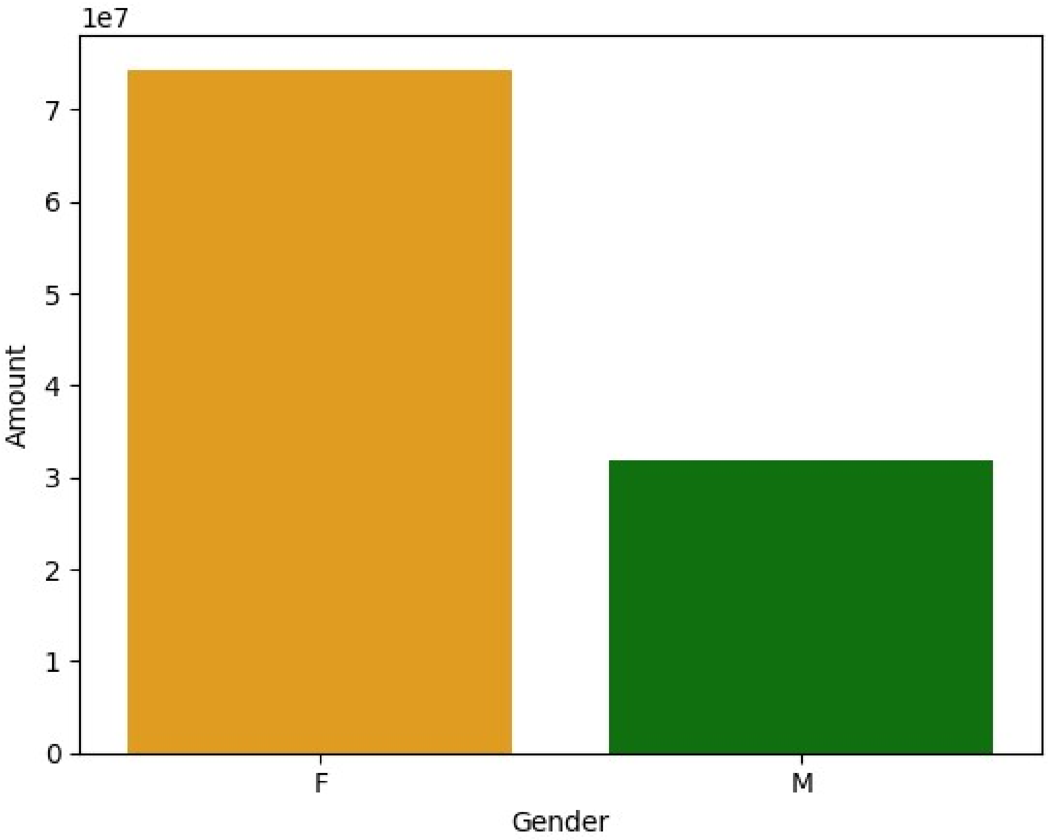
Gender

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

ax = sns.countplot(x = 'Gender',data = df,palette=['orange', 'green'])

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



```
# 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,palette=['orange', 'green'])
```

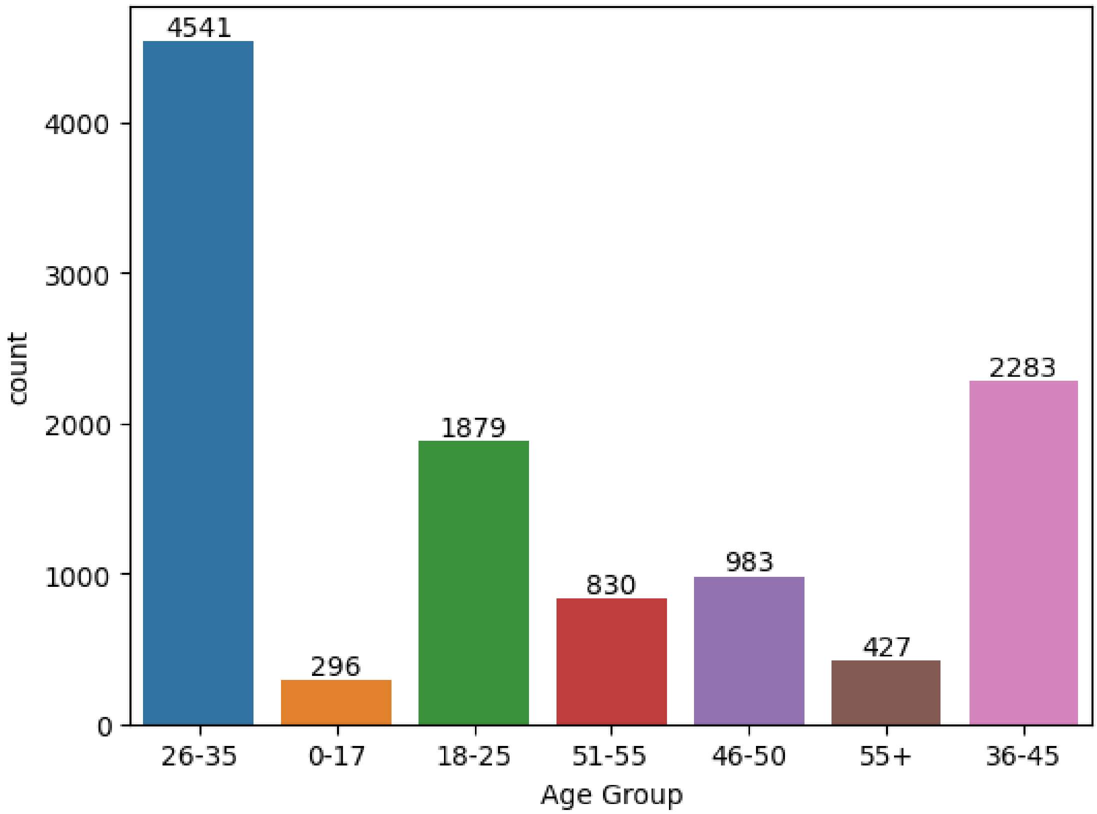
```
<Axes: xlabel='Gender', ylabel='Amount'>
```



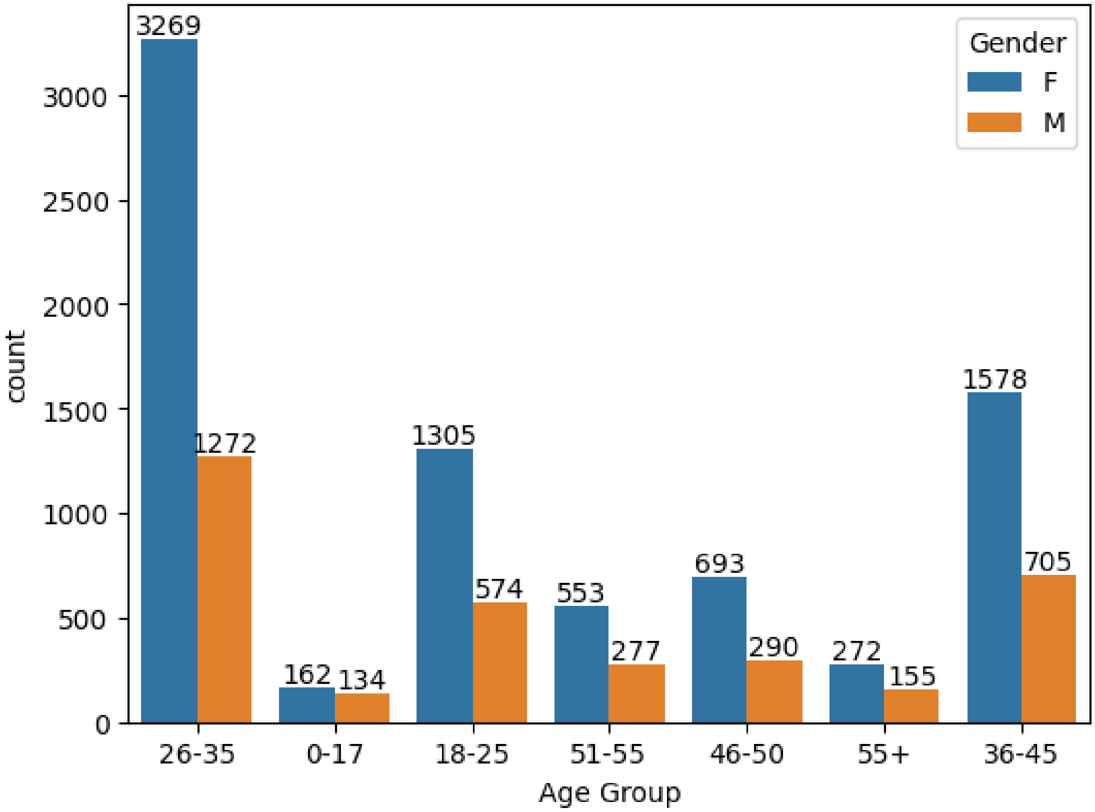
NOTE1: From the above graphs we can observe that the female population has more buyers & their purchasing power is higher as well.

AGE

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

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

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

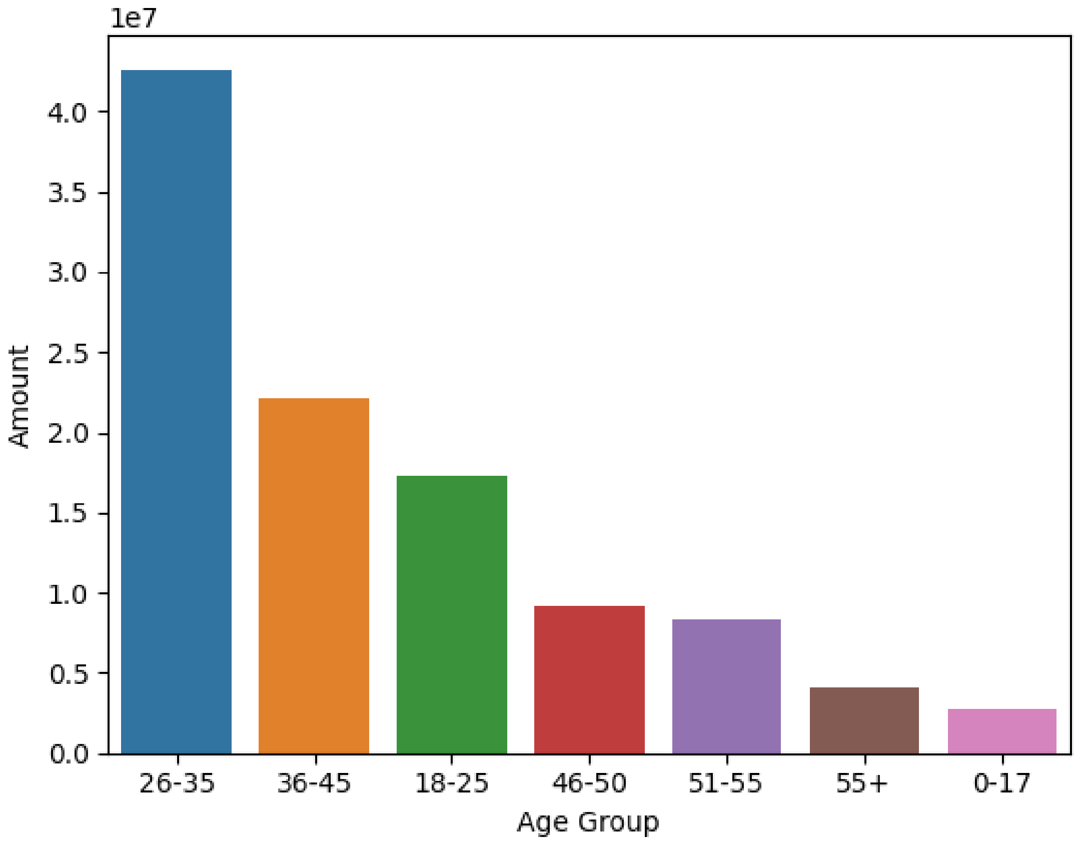


```
ax = sns.countplot(x = 'Age Group',data = df,hue = 'Gender')

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



```
# 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)
```

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



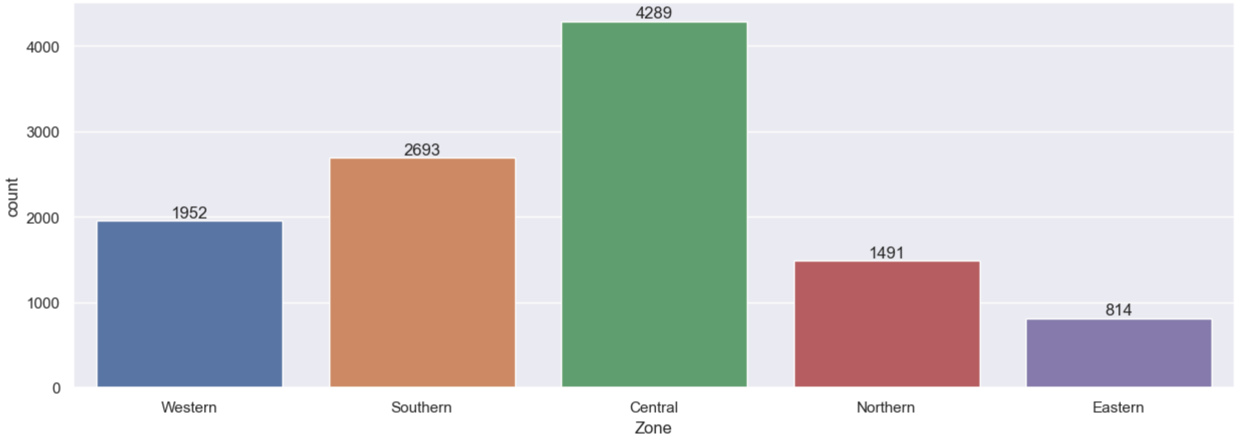
NOTE2: From above graphs we can see that most of the buyers are of age group between 26-35 yrs female

Zone

```
df.columns
```

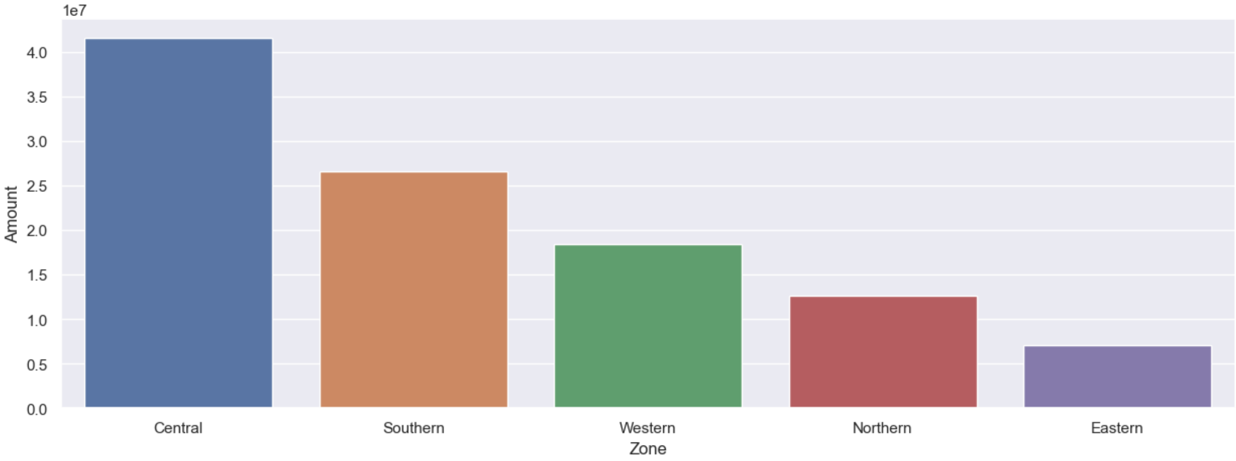
```
Index(['User_ID', 'Cust_name', 'Product_ID', 'Gender', 'Age Group',
'Age',
       'Marital_Status', 'State', 'Zone', 'Occupation',
'Product_Category',
       'Orders', 'Amount'],
      dtype='object')
```

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

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

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



```python
# plotting a bar chart for Zone vs total amount

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

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

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

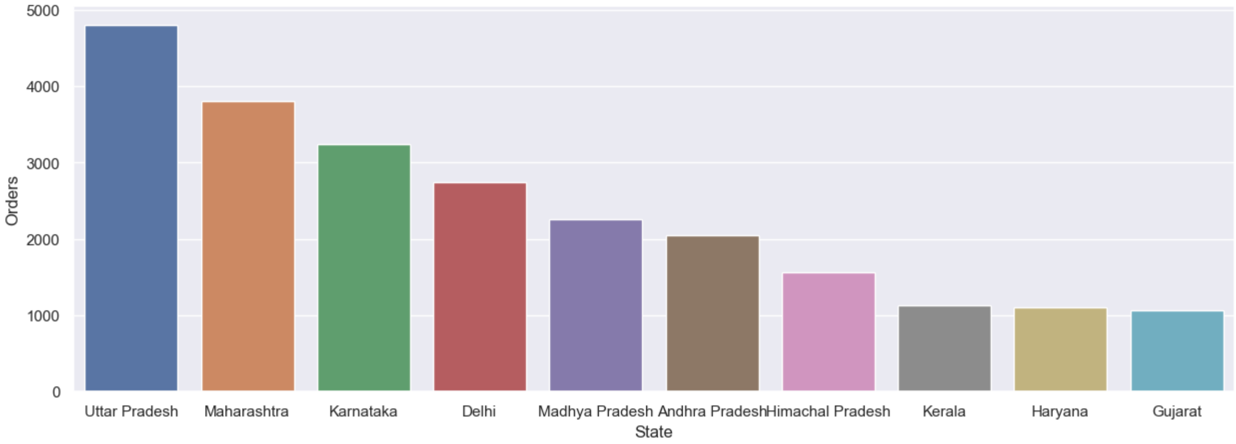


NOTE3: The Higher Sales are contributed by the central zone of the Nation

State

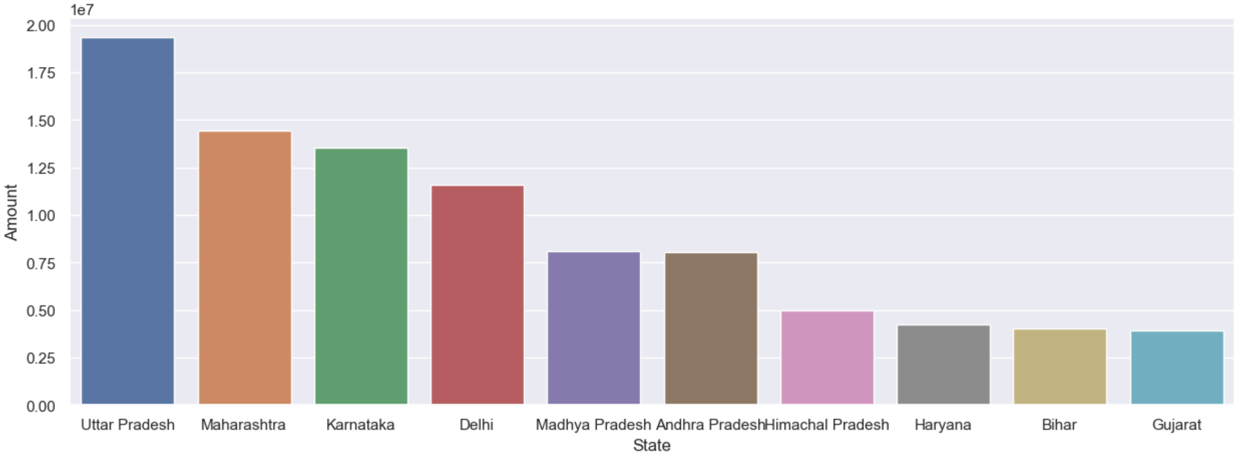
```python
# total number of orders from top 10 states

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')
```

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



```
# 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')
```

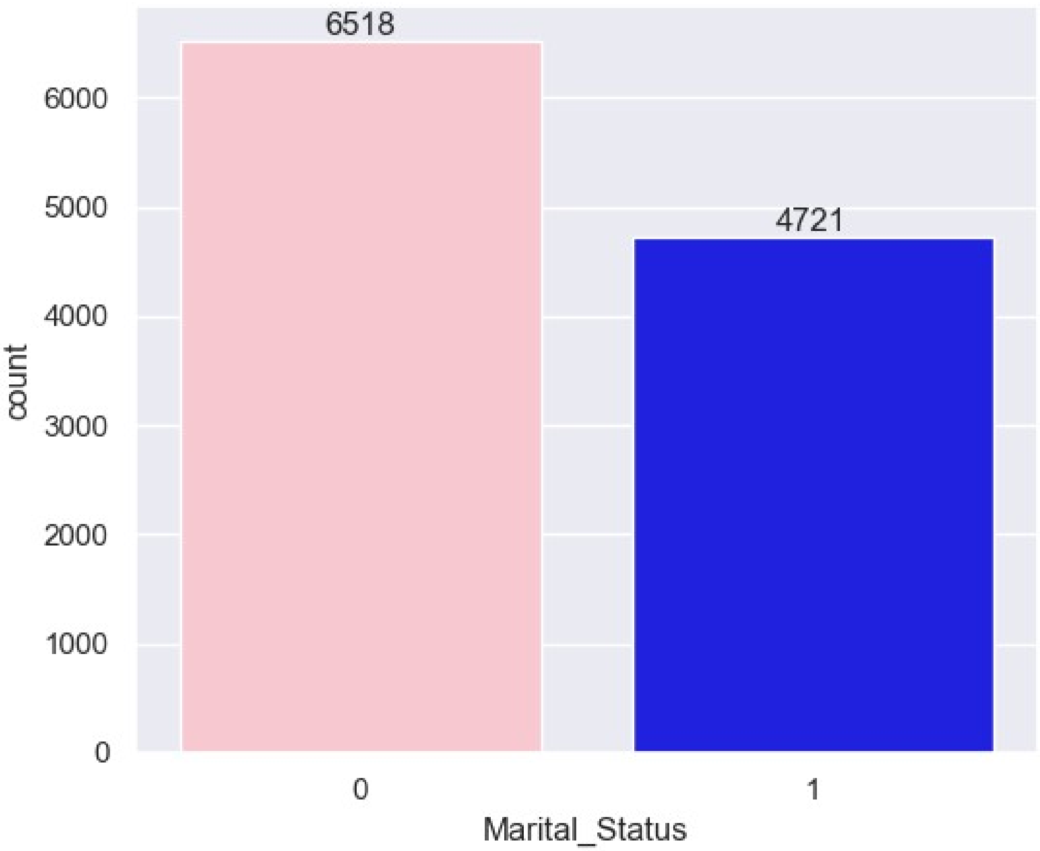
```
<Axes: xlabel='State', ylabel='Amount'>
```



NOTE4: Top 5 states contributing to the sale are UP,Maharashtra,Karnataka,Delhi and MP

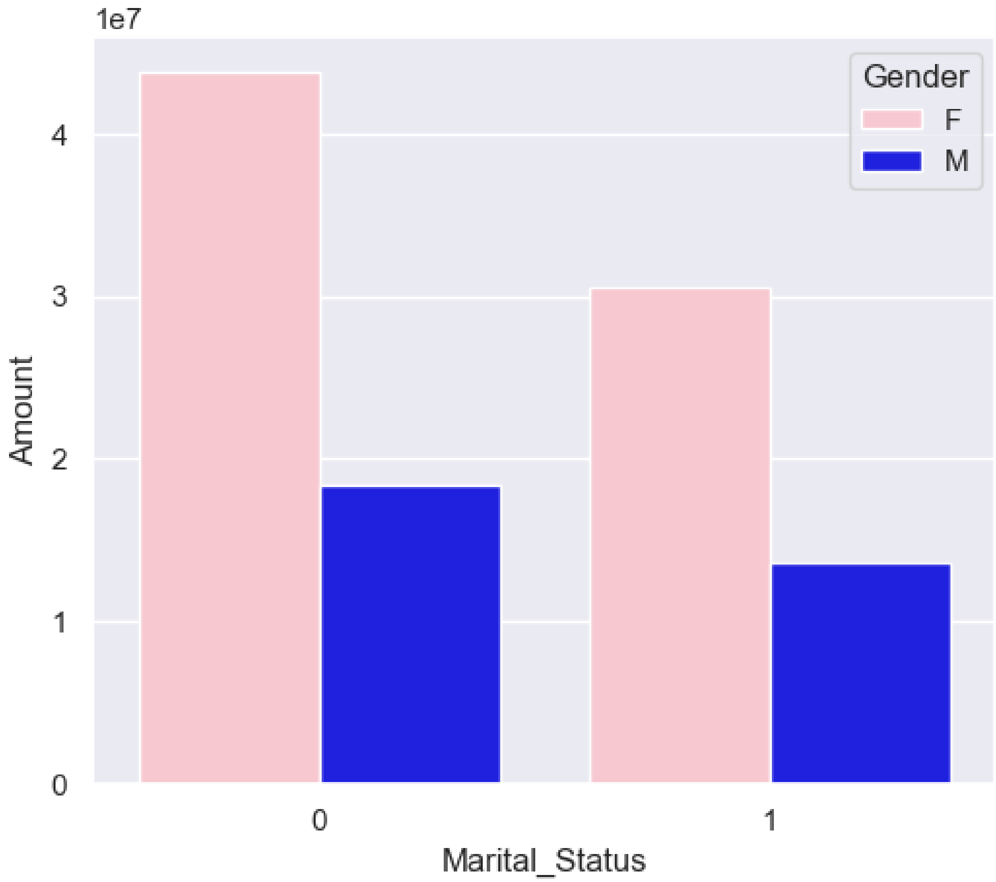
Marital Status

```
ax = sns.countplot(data = df, x = 'Marital_Status',palette =
['pink','blue'])

sns.set(rc={'figure.figsize':(2,5)})
for bars in ax.containers:
    ax.bar_label(bars)
```



```
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',palette = ['Pink','blue'])
```

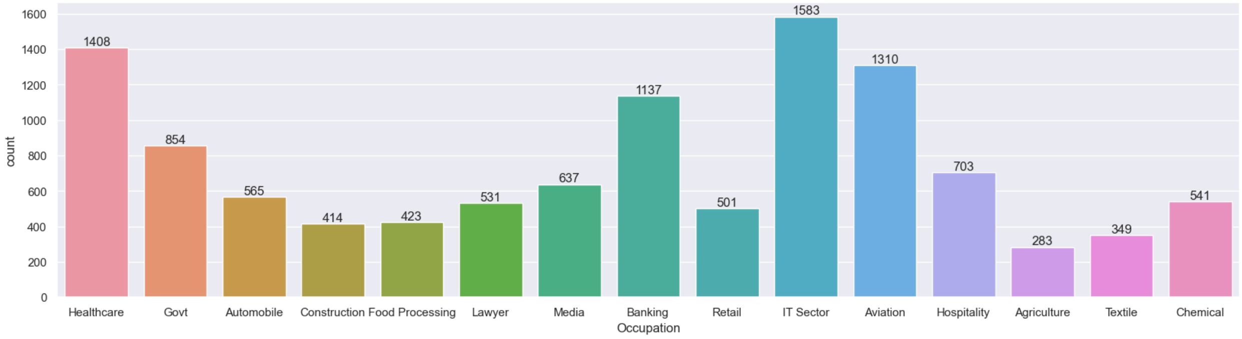
```
<Axes: xlabel='Marital_Status', ylabel='Amount'>
```



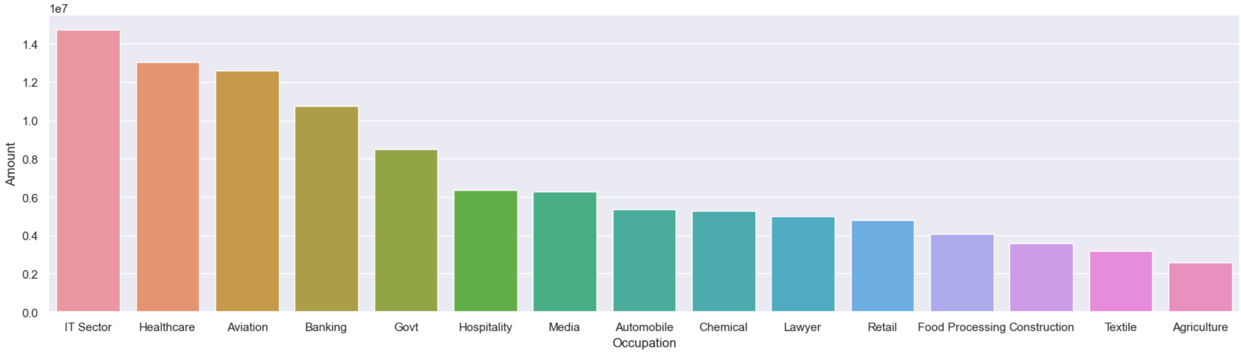
NOTE5: From above graphs we can see that most of the buyers are married (women) and they have high purchasing power

Occupation

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

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



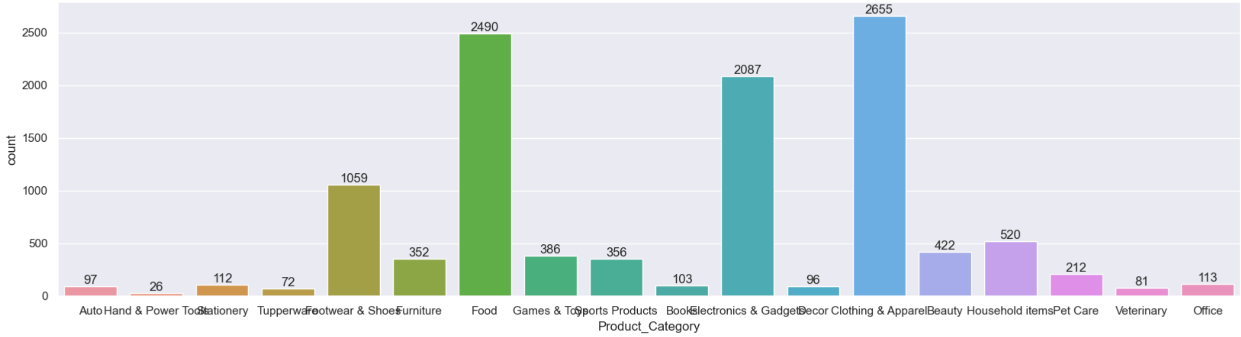
```
sales_state = df.groupby(['Occupation'], as_index=False)
['Amount'].sum().sort_values(by='Amount', ascending=False)

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

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



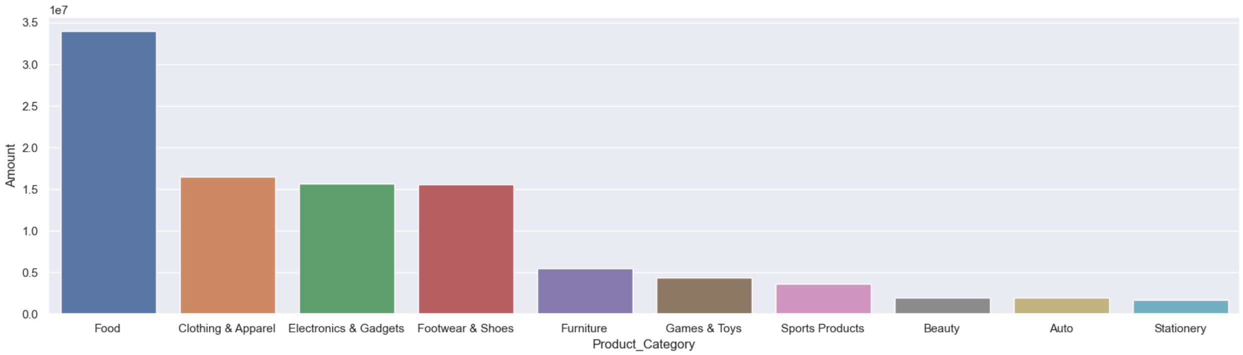
NOTE6: From above graphs we can see that most of the buyers are working in IT, Healthcare and Aviation sector

Product Category

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

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

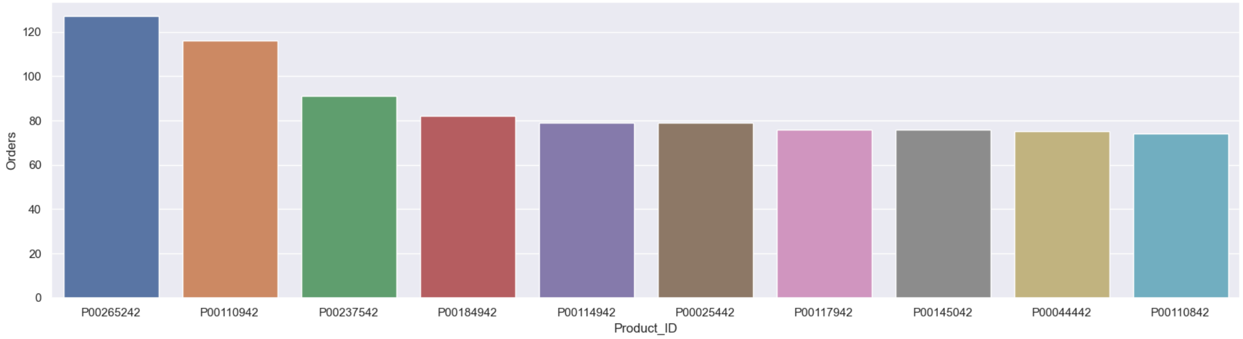


```
sales_state = df.groupby(['Product_Category'], as_index=False)
['Amount'].sum().sort_values(by='Amount', ascending=False).head(10)

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

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



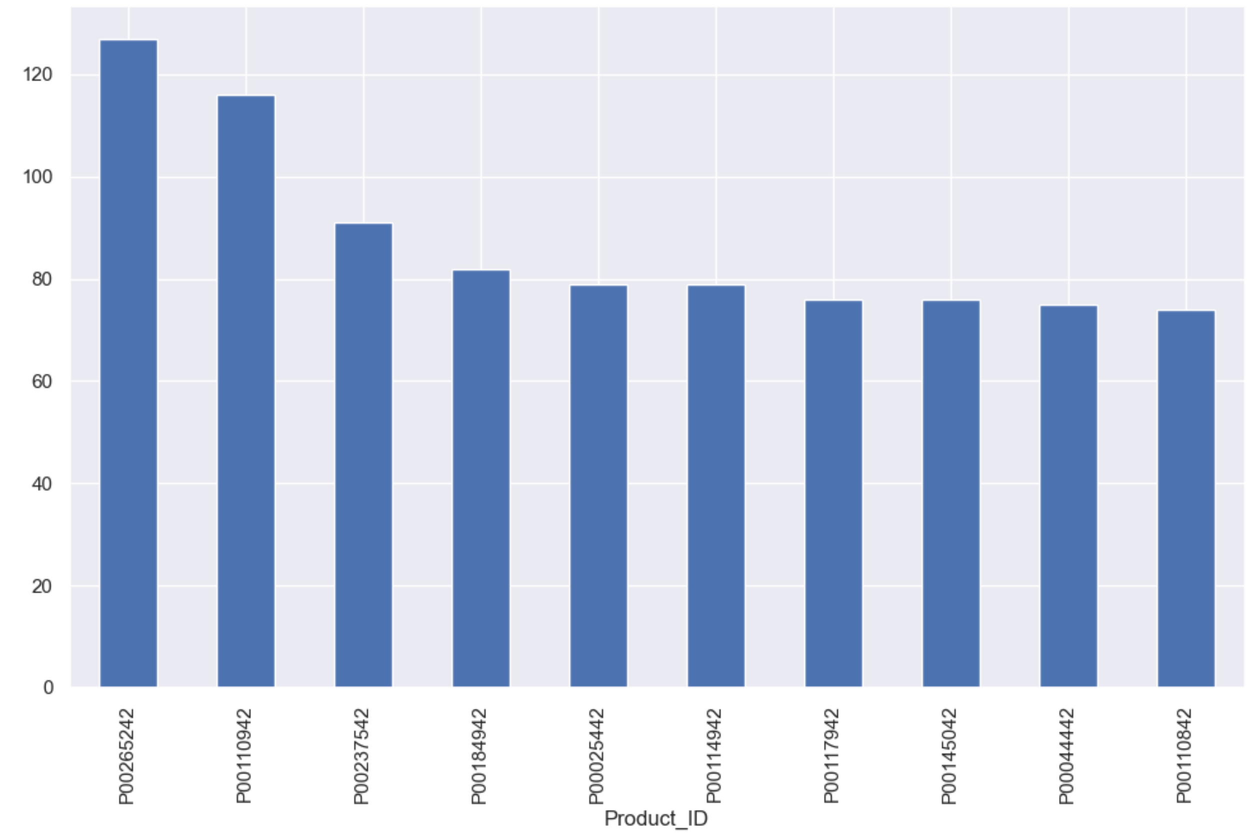
```
sales_state = df.groupby(['Product_ID'], as_index=False)
['Orders'].sum().sort_values(by='Orders', ascending=False).head(10)

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

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



```
# 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')
```

```
<Axes: xlabel='Product_ID'>
```



CONCLUSION

Upon Analysing the Diwali Sales across India, we figure out that major contributor towards the sales is Female population aged between 26 -35. IT sector employees tops the purchasing power followed by healthcare and aviation professionals. A huge chunk of sale value is generated from the Central Zone of the country.Upon further analysis we get the states contributing to major sale are UP,Maharashtra,Karnataka,Delhi and Madhya Pradesh (TOP 5). Top product category in demand are food,cloths and gadgets.