```
In [12]: import numpy as np
          import pandas as pd
          import matplotlib.pyplot as plt
          import seaborn as sns
In [16]: df=pd.read_csv(r"C:\Users\KIIT\OneDrive - kiit.ac.in\Desktop\data analystics\python\di.csv", encoding='latin1')
Out[16]:
                 User_ID
                          Cust_name Product_ID Gender Age Group Age Marital_Status
                                                                                             State
                                                                                                      Zone
                                                                                                                 Occupation Product_Category Orders Amount Status unnamed1
              0 1002903
                             Sanskriti P00125942
                                                     F
                                                            26-35
                                                                   28
                                                                                        Maharashtra Western
                                                                                                                 Healthcare
                                                                                                                                      Auto
                                                                                                                                                1 23952.0
                                                                                                                                                            NaN
                                                                                                                                                                      NaN
              1 1000732
                               Kartik P00110942
                                                     F
                                                            26-35
                                                                   35
                                                                                 1 Andhra Pradesh Southern
                                                                                                                                                3 23934.0
                                                                                                                                                            NaN
                                                                                                                      Govt
                                                                                                                                      Auto
                                                                                                                                                                      NaN
                                                                                                                 Automobile
              2 1001990
                               Bindu P00118542
                                                     F
                                                            26-35
                                                                   35
                                                                                      Uttar Pradesh
                                                                                                    Central
                                                                                                                                      Auto
                                                                                                                                                3 23924.0
                                                                                                                                                            NaN
                                                                                                                                                                      NaN
                                                                                 1
                              Sudevi P00237842
              3 1001425
                                                             0-17
                                                                  16
                                                                                 0
                                                                                                                                                            NaN
                                                    M
                                                                                         Karnataka Southern
                                                                                                                Construction
                                                                                                                                      Auto
                                                                                                                                                2 23912.0
                                                                                                                                                                      NaN
              4 1000588
                                Joni P00057942
                                                    M
                                                            26-35
                                                                   28
                                                                                            Gujarat Western Food Processing
                                                                                                                                                2 23877.0
                                                                                                                                                            NaN
                                                                                                                                                                      NaN
                                                                                                                                      Auto
          11246 1000695
                             Manning P00296942
                                                    M
                                                            18-25
                                                                   19
                                                                                        Maharashtra Western
                                                                                                                  Chemical
                                                                                                                                     Office
                                                                                                                                                    370.0
                                                                                                                                                            NaN
                                                                                                                                                                      NaN
          11247 1004089 Reichenbach P00171342
                                                            26-35 33
                                                                                                                                                    367.0
                                                                                           Haryana Northern
                                                                                                                 Healthcare
                                                                                                                                  Veterinary
                                                                                                                                                            NaN
                                                                                                                                                                      NaN
          11248 1001209
                               Oshin P00201342
                                                     F
                                                            36-45
                                                                   40
                                                                                 0 Madhya Pradesh
                                                                                                    Central
                                                                                                                    Textile
                                                                                                                                     Office
                                                                                                                                                    213.0
                                                                                                                                                            NaN
                                                                                                                                                                      NaN
          11249 1004023
                             Noonan P00059442
                                                    M
                                                            36-45 37
                                                                                                                                                            NaN
                                                                                         Karnataka Southern
                                                                                                                 Agriculture
                                                                                                                                     Office
                                                                                                                                                3
                                                                                                                                                    206.0
                                                                                                                                                                      NaN
          11250 1002744
                             Brumley P00281742
                                                     F
                                                            18-25
                                                                   19
                                                                                        Maharashtra Western
                                                                                                                 Healthcare
                                                                                                                                     Office
                                                                                                                                                3
                                                                                                                                                    188.0
                                                                                                                                                            NaN
                                                                                                                                                                      NaN
         11251 rows × 15 columns
In [18]: df.shape
Out[18]: (11251, 15)
In [19]: df.head()
Out[19]:
             User_ID Cust_name Product_ID Gender Age Group Age Marital_Status
                                                                                        State
                                                                                                 Zone
                                                                                                           Occupation Product_Category Orders Amount Status unnamed1
          0 1002903
                        Sanskriti P00125942
                                                       26-35
                                                             28
                                                                                  Maharashtra
                                                                                              Western
                                                                                                           Healthcare
                                                                                                                                Auto
                                                                                                                                          1 23952.0
                                                                                                                                                       NaN
                                                                                                                                                                 NaN
          1 1000732
                          Kartik P00110942
                                                       26-35 35
                                                                            1 Andhra Pradesh Southern
                                                                                                                                          3 23934.0
                                                                                                                                                      NaN
                                                                                                                                                                 NaN
                                                                                                                Govt
                                                                                                                                Auto
          2 1001990
                          Bindu P00118542
                                                       26-35 35
                                                                                Uttar Pradesh
                                                                                               Central
                                                                                                           Automobile
                                                                                                                                Auto
                                                                                                                                          3 23924.0
                                                                                                                                                       NaN
                                                                                                                                                                 NaN
          3 1001425
                         Sudevi P00237842
                                                       0-17 16
                                                                            0
                                                                                    Karnataka Southern
                                                                                                                                          2 23912.0
                                                                                                                                                      NaN
                                                                                                                                                                 NaN
                                                                                                          Construction
                                                                                                                                Auto
          4 1000588
                           Joni P00057942
                                                       26-35 28
                                                                                      Gujarat Western Food Processing
                                                                                                                                Auto
                                                                                                                                          2 23877.0
                                                                                                                                                      NaN
                                                                                                                                                                 NaN
In [20]: 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
              Cust_name
                                 11251 non-null object
              Product_ID
                                 11251 non-null object
              Gender
                                 11251 non-null object
         3
             Age Group
                                 11251 non-null object
                                 11251 non-null int64
             Age
             Marital_Status
                                11251 non-null int64
                                 11251 non-null object
         7
              State
                                 11251 non-null object
         8
             Zone
                                 11251 non-null object
         9
              Occupation
         10 Product_Category 11251 non-null object
         11 Orders
                                 11251 non-null int64
         12 Amount
                                 11239 non-null float64
                                 0 non-null
         13 Status
                                                  float64
         14 unnamed1
                                 0 non-null
                                                  float64
         dtypes: float64(3), int64(4), object(8)
         memory usage: 1.3+ MB
In [21]: df.drop(['Status', 'unnamed1'], axis=1, inplace = True)
In [22]: df
Out[22]:
                 User_ID
                          Cust_name Product_ID Gender Age Group Age Marital_Status
                                                                                                                 Occupation Product_Category Orders Amount
                                                                                             State
                                                                                                      Zone
              0 1002903
                             Sanskriti P00125942
                                                                                                                                                1 23952.0
                                                            26-35
                                                                   28
                                                                                        Maharashtra Western
                                                                                                                 Healthcare
                                                                                                                                      Auto
              1 1000732
                               Kartik P00110942
                                                     F
                                                            26-35
                                                                                 1 Andhra Pradesh Southern
                                                                                                                                      Auto
                                                                                                                                                3 23934.0
                                                                                                                      Govt
              2 1001990
                               Bindu P00118542
                                                                   35
                                                                                      Uttar Pradesh
                                                     F
                                                            26-35
                                                                                                    Central
                                                                                                                                                3 23924.0
                                                                                                                 Automobile
                                                                                                                                      Auto
              3 1001425
                              Sudevi P00237842
                                                    M
                                                             0-17
                                                                  16
                                                                                         Karnataka Southern
                                                                                                                Construction
                                                                                                                                      Auto
                                                                                                                                                2 23912.0
              4 1000588
                                                            26-35
                                Joni P00057942
                                                    M
                                                                   28
                                                                                            Gujarat Western Food Processing
                                                                                                                                      Auto
                                                                                                                                                2 23877.0
          11246 1000695
                             Manning P00296942
                                                            18-25
                                                                                                                                     Office
                                                                                                                                                    370.0
                                                    M
                                                                   19
                                                                                        Maharashtra Western
                                                                                                                  Chemical
                                                                                                                                                4
                                                                                           Haryana Northern
          11247 1004089 Reichenbach P00171342
                                                            26-35
                                                                                                                 Healthcare
                                                                                                                                  Veterinary
                                                                                                                                                    367.0
          11248 1001209
                               Oshin P00201342
                                                     F
                                                            36-45
                                                                   40
                                                                                 0 Madhya Pradesh
                                                                                                    Central
                                                                                                                                     Office
                                                                                                                                                    213.0
                                                                                                                     Textile
          11249 1004023
                             Noonan P00059442
                                                            36-45 37
                                                                                          Karnataka Southern
                                                                                                                 Agriculture
                                                                                                                                     Office
                                                                                                                                                    206.0
          11250 1002744
                                                     F
                                                            18-25 19
                                                                                                                                     Office
                                                                                                                                                    188.0
                             Brumley P00281742
                                                                                        Maharashtra Western
                                                                                                                 Healthcare
                                                                                                                                                3
         11251 rows × 13 columns
In [24]: pd.isnull(df).sum()
Out[24]: User_ID
                                 0
          Cust_name
                                 0
          Product_ID
          Gender
          Age Group
          Age
          Marital_Status
          State
          Zone
          Occupation
          Product_Category
                                0
          Orders
                                0
                               12
          Amount
          dtype: int64
In [26]: df.dropna(inplace=True)
          df
Out[26]:
                 User_ID Cust_name Product_ID Gender Age Group Age Marital_Status
                                                                                             State
                                                                                                                 Occupation Product_Category Orders Amount
                                                                                                      Zone
              0 1002903
                             Sanskriti P00125942
                                                            26-35 28
                                                                                        Maharashtra Western
                                                                                                                 Healthcare
                                                                                                                                      Auto
                                                                                                                                                1 23952.0
             1 1000732
                              Kartik P00110942
                                                            26-35 35
                                                                                1 Andhra Pradesh Southern
                                                                                                                                      Auto
                                                                                                                                                3 23934.0
                                                                                      Uttar Pradesh
              2 1001990
                               Bindu P00118542
                                                            26-35
                                                                   35
                                                                                                                                                3 23924.0
                                                                                                    Central
                                                                                                                 Automobile
                                                                                                                                      Auto
              3 1001425
                              Sudevi P00237842
                                                                                          Karnataka Southern
                                                             0-17
                                                                   16
                                                                                                                Construction
                                                                                                                                      Auto
                                                                                                                                                2 23912.0
                                Joni P00057942
              4 1000588
                                                            26-35
                                                                   28
                                                                                            Gujarat Western Food Processing
                                                                                                                                      Auto
                                                                                                                                                2 23877.0
          11246 1000695
                                                                                                                                     Office
                             Manning P00296942
                                                    M
                                                            18-25
                                                                  19
                                                                                        Maharashtra Western
                                                                                                                  Chemical
                                                                                                                                                    370.0
          11247 1004089 Reichenbach P00171342
                                                            26-35
                                                                  33
                                                                                                                                                    367.0
                                                                                           Haryana Northern
                                                                                                                 Healthcare
                                                                                                                                  Veterinary
          11248 1001209
                               Oshin P00201342
                                                                   40
                                                     F
                                                            36-45
                                                                                 0 Madhya Pradesh
                                                                                                                     Textile
                                                                                                                                     Office
                                                                                                                                                    213.0
                                                                                                    Central
                              Noonan P00059442
                                                            36-45
                                                                   37
                                                                                                                                     Office
                                                                                                                                                    206.0
          11249 1004023
                                                                                          Karnataka Southern
                                                                                                                  Agriculture
          11250 1002744
                             Brumley P00281742
                                                            18-25
                                                                   19
                                                                                        Maharashtra Western
                                                                                                                                     Office
                                                                                                                                                3
                                                                                                                                                    188.0
                                                                                                                 Healthcare
         11239 rows × 13 columns
In [27]: | df['Amount']=df['Amount'].astype(int)
In [28]: df['Amount'].dtype
Out[28]: dtype('int32')
In [31]: df.columns
Out[31]: Index(['User_ID', 'Cust_name', 'Product_ID', 'Gender', 'Age Group', 'Age',
                  'Marital_Status', 'State', 'Zone', 'Occupation', 'Product_Category',
                 'Orders', 'Amount'],
                 dtype='object')
In [32]: df.rename(columns={'Marital_Status':'Shaadi'})
Out[32]:
                                                                                                           Occupation Product_Category Orders Amount
                         Cust_name Product_ID Gender Age Group Age Shaadi
                 User_ID
                                                                                        State
                                                                                                Zone
              0 1002903
                                                                                                                                          1 23952
                             Sanskriti P00125942
                                                            26-35
                                                                   28
                                                                                  Maharashtra Western
                                                                                                           Healthcare
                                                                                                                                Auto
              1 1000732
                               Kartik P00110942
                                                     F
                                                            26-35
                                                                   35
                                                                           1 Andhra Pradesh Southern
                                                                                                                                Auto
                                                                                                                                          3 23934
                                                                                                                Govt
              2 1001990
                               Bindu P00118542
                                                     F
                                                            26-35
                                                                   35
                                                                                                           Automobile
                                                                                                                                          3 23924
                                                                                Uttar Pradesh
                                                                                               Central
                                                                                                                                Auto
              3 1001425
                              Sudevi P00237842
                                                             0-17
                                                                   16
                                                                                    Karnataka Southern
                                                                                                                                Auto
                                                                                                                                          2 23912
                                                                                                          Construction
              4 1000588
                                Joni P00057942
                                                    М
                                                            26-35
                                                                   28
                                                                                      Gujarat Western Food Processing
                                                                                                                                Auto
                                                                                                                                          2 23877
                                                                                                                               Office
          11246 1000695
                             Manning P00296942
                                                    M
                                                            18-25
                                                                                                                                                370
                                                                   19
                                                                                  Maharashtra Western
                                                                                                                                          4
                                                                                                             Chemical
          11247 1004089 Reichenbach P00171342
                                                            26-35
                                                                   33
                                                                                     Haryana Northern
                                                                                                           Healthcare
                                                                                                                                                367
                                                                                                                            Veterinary
                                                                                                                                          3
          11248 1001209
                               Oshin P00201342
                                                     F
                                                            36-45
                                                                   40
                                                                           0 Madhya Pradesh
                                                                                                                               Office
                                                                                                                                                213
                                                                                               Central
                                                                                                               Textile
          11249 1004023
                             Noonan P00059442
                                                            36-45
                                                                   37
                                                                                    Karnataka Southern
                                                                                                           Agriculture
                                                                                                                               Office
                                                                                                                                          3
                                                                                                                                                206
                                                            18-25
                                                                                                                               Office
                                                                                                                                          3
                                                                                                                                                188
          11250 1002744
                             Brumley P00281742
                                                     F
                                                                   19
                                                                           0
                                                                                  Maharashtra Western
                                                                                                           Healthcare
         11239 rows × 13 columns
In [37]: sales_gen=df.groupby(['Gender'], as_index=False)['Amount'].sum().sort_values(by = 'Amount', ascending=True)
In [46]: | ll=sns.barplot(x='Gender', y='Amount', data=sales_gen, hue='Gender')
          for bar in ll.containers:
              11.bar_label(bar)
              1e7
                                                          7.43359e+07
            6
           5
         Amount
                         3.19133e+07
            3
            2
            1
                              Μ
                                                                F
                                             Gender
In [44]: 11
Out[44]: <Axes: xlabel='Gender', ylabel='Amount'>
In [55]: sales_state=df.groupby(['State'], as_index=False)['Orders'].sum().sort_values(by='Orders', ascending=True)
          sales_state
          sns.set(rc={'figure.figsize':(15,5)})
          sns.barplot(x='State', y='Orders', data=sales_state, hue='State')
Out[55]: <Axes: xlabel='State', ylabel='Orders'>
            5000
            4000
            3000
         Orders
            2000
            1000
               0
                   Telangana Punjab RajasthanUttarakhandlharkhand Bihar
                                                                                                   Kerallelimachal Prandellsha PradeshDelhi
                                                                                                                                                   Karnataka Maharash tutatar Pradesh
                                                                               Gujarat Haryana
                                                                                               State
In [62]: sales_state=df.groupby(['State'], as_index=False)['Amount'].sum().sort_values(by='Amount', ascending=False)
          sales_state
          sns.set(rc={'figure.figsize':(26,5)})
          amountt=sns.barplot(x='State',y='Amount',data=sales_state,hue='State')
          for bars in amountt.containers:
              amountt.bar_label(bars)
          2.00
                1.9375e+07
           1.75
          1.50
                            1.44275e+07
                                         1.35235e+07
           1.25
                                                     1.16038e+07
        Amount 00.1
                                                                 8.10114e+06 8.03715e+06
          0.75
                                                                                          4.96337e+06
          0.50
                                                                                                      4.22018e+06
                                                                                                                  4.02276e+06 3.94608e+06 3.89449e+06
                                                                                                                                                       3.02646e+06
                                                                                                                                                                   2.52094e+06
          0.25
                                                                                                                                                                                1.90941e+06
                                                                                                                                                                                             1.5258e+06
                                                                                                                                                                                                        1.15149e+06
          0.00
                                                                                                                                                                                 Rajasthan
                                                                Madhya Pradesh Andhra Pradesh Himachal Pradesh
                Uttar Pradesh
                             Maharashtra
                                          Karnataka
                                                        Delhi
                                                                                                        Haryana
                                                                                                                     Bihar
                                                                                                                                 Gujarat
                                                                                                                                             Kerala
                                                                                                                                                         Jharkhand
                                                                                                                                                                    Uttarakhand
                                                                                                                                                                                              Punjab
                                                                                                                                                                                                          Telangana
                                                                                                               State
In [65]: sales_state=df.groupby(['Occupation'], as_index=False)['Amount'].sum().sort_values(by='Amount', ascending=False)
          sales_state
          sns.set(rc={'figure.figsize':(26,5)})
          amountt=sns.barplot(x='Occupation', y='Amount', data=sales_state, hue='Occupation')
          for bars in amountt.containers:
              amountt.bar_label(bars)
              1e7
                1.47551e+07
           1.4
                             1.30346e+07
                                          1.26023e+07
          1.2
                                                       1.07706e+07
          1.0
                                                                    8.51721e+06
        Amount
8.0
                                                                                  6.3764e+06
                                                                                              6.29583e+06
          0.6
                                                                                                            5.3686e+06
                                                                                                                         5.29744e+06
                                                                                                                                      4.98166e+06
                                                                                                                                                   4.78317e+06
                                                                                                                                                                4.07067e+06
                                                                                                                                                                             3.59751e+06
          0.4
                                                                                                                                                                                           3.20497e+06
                                                                                                                                                                                                        2.59309e+06
          0.2
          0.0
                 IT Sector
                              Healthcare
                                            Aviation
                                                         Banking
                                                                                                                           Chemical
                                                                                                                                                                              Construction
                                                                       Govt
                                                                                   Hospitality
                                                                                                 Media
                                                                                                             Automobile
                                                                                                                                         Lawyer
                                                                                                                                                      Retail
                                                                                                                                                                Food Processing
                                                                                                                                                                                                         Agriculture
                                                                                                             Occupation
In [68]: ax=sns.countplot(x='Product_Category', data=df, hue='Product_Category')
          for bars in ax.containers:
              ax.bar_label(bars)
                                                                                                                                                      2655
                                                                                    2490
          2500
                                                                                                                               2087
          2000
        ≒ <sup>1500</sup>
                                                               1059
           1000
           500
                                                                                                                                                                 422
                                                                                                                                                                                       212
                                                                                                                     103
                                                                                                                                                                                                            113
                                                                                                                                                                                                  81
                                                    72
                                                                                                                    Books Electronics & Gadgets Decor Clothing & Apparel Beauty
                         Hand & Power Tools Stationery
                                                 Tupperware Footwear & Shoes Furniture
                                                                                            Games & Toys Sports Products
                                                                                                                                                                       Household items Pet Care
                                                                                                                                                                                                Veterinary
                                                                                                                                                                                                            Office
                                                                                                          Product_Category
         sales_state=df.groupby(['Product_Category'],as_index=False)['Amount'].sum().sort_values(by='Amount',ascending=False)
          sales_state
          sns.set(rc={'figure.figsize':(26,5)})
          amountt=sns.barplot(x='Product_Category', y='Amount', data=sales_state, hue='Product_Category')
          3.5
          3.0
          2.5
         ± 2.0
      Amor
1.5
```

1.0

0.5

0.0

Clothing & Applatectronics & Gadgletotwear & Shoes Furniture

Games & Toys Sports Products

Product\_Category

Pet Care Hand & Power Tools Veterinary

Office

In [ ]:			
In [ ]:			