```python
import pandas as pd
import matplotlib.pyplot as plt
import numpy as np

!pip install matplotlib
```

```
Defaulting to user installation because normal site-packages is not
writeable
Collecting matplotlib
  Downloading matplotlib-3.10.6-cp313-cp313-win_amd64.whl.metadata (11
kB)
Collecting contourpy>=1.0.1 (from matplotlib)
  Downloading contourpy-1.3.3-cp313-cp313-win_amd64.whl.metadata (5.5
kB)
Collecting cycler>=0.10 (from matplotlib)
  Downloading cycler-0.12.1-py3-none-any.whl.metadata (3.8 kB)
Requirement already satisfied: fonttools>=4.22.0 in c:\users\success\
appdata\roaming\python\python313\site-packages (from matplotlib)
(4.60.1)
Collecting kiwisolver>=1.3.1 (from matplotlib)
  Downloading kiwisolver-1.4.9-cp313-cp313-win_amd64.whl.metadata (6.4
kB)
Requirement already satisfied: numpy>=1.23 in c:\users\success\
appdata\roaming\python\python313\site-packages (from matplotlib)
(2.3.3)
Requirement already satisfied: packaging>=20.0 in c:\users\success\
appdata\roaming\python\python313\site-packages (from matplotlib)
(25.0)
Requirement already satisfied: pillow>=8 in c:\users\success\appdata\
roaming\python\python313\site-packages (from matplotlib) (11.3.0)
Collecting pyparsing>=2.3.1 (from matplotlib)
  Downloading pyparsing-3.2.5-py3-none-any.whl.metadata (5.0 kB)
Requirement already satisfied: python-dateutil>=2.7 in c:\users\
success\appdata\roaming\python\python313\site-packages (from
matplotlib) (2.9.0.post0)
Requirement already satisfied: six>=1.5 in c:\users\success\appdata\
roaming\python\python313\site-packages (from python-dateutil>=2.7-
>matplotlib) (1.17.0)
Downloading matplotlib-3.10.6-cp313-cp313-win_amd64.whl (8.1 MB)
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   ------------------------------------ --- 7.3/8.1 MB 12.5 MB/s eta
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   ---------------------------------------- 8.1/8.1 MB 10.6 MB/s
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Downloading contourpy-1.3.3-cp313-cp313-win_amd64.whl (226 kB)
Downloading cycler-0.12.1-py3-none-any.whl (8.3 kB)
Downloading kiwisolver-1.4.9-cp313-cp313-win_amd64.whl (73 kB)
Downloading pyparsing-3.2.5-py3-none-any.whl (113 kB)
Installing collected packages: pyparsing, kiwisolver, cycler,
contourpy, matplotlib

   ---------------------------------------- 0/5 [pyparsing]
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   -------- ------------------------------- 1/5 [kiwisolver]
   ------------------------ --------------- 3/5 [contourpy]
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Successfully installed contourpy-1.3.3 cycler-0.12.1 kiwisolver-1.4.9
matplotlib-3.10.6 pyparsing-3.2.5
```

```python
#question 1
import pandas as pd
data = pd.read_csv("Diwali Sales Data.csv", encoding='latin1')
print(data.describe())

age_group_sales = data.groupby('Age Group')['Amount'].sum()
max_age_group = age_group_sales.idxmax()
max_age_group_amount = age_group_sales.max()

gender_sales = data.groupby('Gender')['Amount'].sum()
max_gender = gender_sales.idxmax()
max_gender_amount = gender_sales.max()

print("the expected results (by Sales Amount):")
print("Max Contributing Age Group:", max_age_group)
print("Total Sales Amount by Max Age Group:", max_age_group_amount)
print("Max Contributing Gender:", max_gender)
print("Total Sales Amount by Max Gender:", max_gender_amount)
```

```
            User_ID           Age  Marital_Status        Orders
Amount  \
count  1.125100e+04  11251.000000    11251.000000  11251.000000
11239.000000
mean   1.003004e+06     35.421207        0.420318      2.489290
9453.610858
std    1.716125e+03     12.754122        0.493632      1.115047
5222.355869
min    1.000001e+06     12.000000        0.000000      1.000000
188.000000
25%    1.001492e+06     27.000000        0.000000      1.500000
5443.000000
50%    1.003065e+06     33.000000        0.000000      2.000000
8109.000000
75%    1.004430e+06     43.000000        1.000000      3.000000
12675.000000
max    1.006040e+06     92.000000        1.000000      4.000000
23952.000000

       Status  unnamed1
count     0.0       0.0
mean      NaN       NaN
std       NaN       NaN
min       NaN       NaN
25%       NaN       NaN
50%       NaN       NaN
75%       NaN       NaN
max       NaN       NaN
the expected results (by Sales Amount):
Max Contributing Age Group: 26-35
Total Sales Amount by Max Age Group: 42613443.94
Max Contributing Gender: F
Total Sales Amount by Max Gender: 74335856.43
```

```python
#question 2
states=data.groupby('State')['Amount'].sum()
zonal=data.groupby('Zone')['Amount'].sum()
print("the expected results:")
print("the zone which has received maximum sales
amount:",zonal.idxmax())
print("corresponding values:",zonal.max())
print("the state which has received maximum sales
amount:",states.idxmax())
print("corresponding sales amount value:",states.max())
```

```
the expected results:
the zone which has received maximum sales amount: Central
corresponding values: 41600873.45
the state which has received maximum sales amount: Uttar Pradesh
corresponding sales amount value: 19374968.0
```

```
#question 3
occupational_max=data.groupby('Occupation')['Orders'].sum()
print("the expected results:")
print("Occupation which has received maximum number of
orders:",occupational_max.idxmax())
print("Corresponding order values:",occupational_max.max())
```

```
the expected results:
Occupation which has received maximum number of orders: IT Sector
Corresponding order values: 4010
```

```
#question 4
pro_cat=data.groupby('Product_Category')['Amount'].sum()
print("the expected results:")
print("product category which earned maximum
amount:",pro_cat.idxmax())
print("corresponding values is:",pro_cat.max())
```

```
the expected results:
product category which earned maximum amount: Food
corresponding values is: 33933883.5
```

```
#question 5
mart_status=data.groupby("Marital_Status")["Amount"].sum()
mart_status1=data.groupby("Marital_Status")["Orders"].sum()
print("the expectedb results:")
print("Marital status with maximum sales(0-single, 1-
married):",mart_status.idxmax())
print("Corresponding values:",mart_status.max())
print("Marital status with maximum orders:",mart_status1.idxmax())
print("Corresponding values:",mart_status1.max())
```

```
the expectedb results:
Marital status with maximum sales(0-single, 1-married): 0
Corresponding values: 62125386.44
Marital status with maximum orders: 0
Corresponding values: 16258
```

```
#grouping by orders for product category,age groups,
state/zone(question 5 contd)
pro_cat_orders=data.groupby('Product_Category')['Orders'].sum()
states1=data.groupby('State')['Orders'].sum()
zonal1=data.groupby('Zone')['Orders'].sum()
age_group_sales1 = data.groupby('Age Group')['Orders'].sum()
max_age_group1 = age_group_sales1.idxmax()
max_age_group_ord = age_group_sales1.max()
gender_sales1 = data.groupby('Gender')['Orders'].sum()
max_gender1 = gender_sales1.idxmax()
max_gender_ord = gender_sales1.max()
print("the expected results:")
print("Product category with max. orders:",pro_cat_orders.idxmax())
```

```python
print("Corresponding order value:",pro_cat_orders.max())
print("Zone which covers max. Orders:",zonal1.idxmax())
print("Corresponding value is:",zonal1.max())
print("State which covers max. Orders:",states1.idxmax())
print("Corresponding values:",states1.max())
print("Age Group places the maximum Orders:",max_age_group1)
print("Corresponding values:",max_age_group_ord)
print("Gender which places maximum orders:",max_gender1)
print("Corresponding values are:",max_gender_ord)
```

```
the expected results:
Product category with max. orders: Clothing & Apparel
Corresponding order value: 6634
Zone which covers max. Orders: Central
Corresponding value is: 10640
State which covers max. Orders: Uttar Pradesh
Corresponding values: 4813
Age Group places the maximum Orders: 26-35
Corresponding values: 11398
Gender which places maximum orders: F
Corresponding values are: 19568
```