```
import numpy as np
```

```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

```
path="/content/drive/MyDrive/POC_solutions/ReUpdated-Data-analyst-Data.csv"
df=pd.read_csv(path)
```

1.**How many students are included in the dataset?**

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4894 entries, 0 to 4893
Data columns (total 16 columns):
 #   Column                                                   Non-Null Count  Dtype  
---  ------                                                   --------------  -----  
 0   First Name                                               4894 non-null   object 
 1   Email ID                                                 4894 non-null   object 
 2   Quantity                                                 4894 non-null   int64  
 3   Events                                                   4894 non-null   object 
 4   Attendee Status                                          4894 non-null   object 
 5   College Name                                             4879 non-null   object 
 6   How did you come to know about this event?               2678 non-null   object 
 7   Specify in "Others" (how did you come to know about this event)  89 non-null     object 
 8   Designation                                              4894 non-null   object 
 9   Year of Graduation                                       4894 non-null   int64  
 10  City                                                     4894 non-null   object 
 11  CGPA                                                     4894 non-null   float64
 12  Experience with python (Months)                          4894 non-null   int64  
 13  Family Income                                            4894 non-null   object 
 14  Expected salary (Lac)                                    4894 non-null   int64  
 15  Leadership- skills                                       4894 non-null   object 
dtypes: float64(1), int64(4), object(11)
memory usage: 611.9+ KB
```

```
df.columns
```

```
Index(['First Name', 'Email ID', 'Quantity', 'Events', 'Attendee Status',
       'College Name', 'How did you come to know about this event?',
       'Specify in "Others" (how did you come to know about this event)',
       'Designation', 'Year of Graduation', 'City', 'CGPA',
       'Experience with python (Months)', 'Family Income',
       'Expected salary (Lac)', 'Leadership- skills'],
      dtype='object')
```

2. **What is the average GPA of the students?**

```
mean_gpa = df['CGPA'].mean()
print("Mean CGPA:", mean_gpa)
```

```
Mean CGPA: 8.038475684511647
```

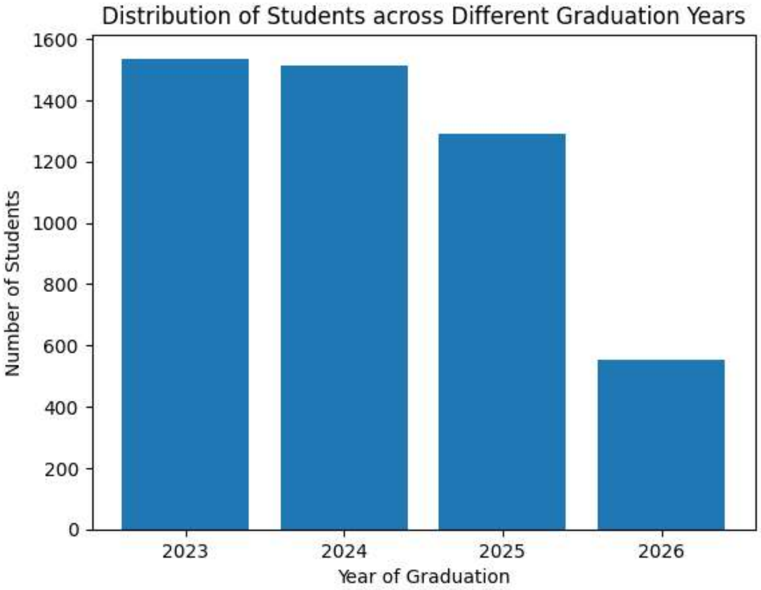
3. **What is the distribution of students across different graduation years?**

```
year_distribution = df['Year of Graduation'].value_counts()

print(year_distribution)
```

```
2023    1536
2024    1511
2025    1292
2026     555
Name: Year of Graduation, dtype: int64
```

```
plt.bar(year_distribution.index, year_distribution.values)
plt.xticks(year_distribution.index)
plt.xlabel('Year of Graduation')
plt.ylabel('Number of Students')
plt.title('Distribution of Students across Different Graduation Years')
plt.show()
```

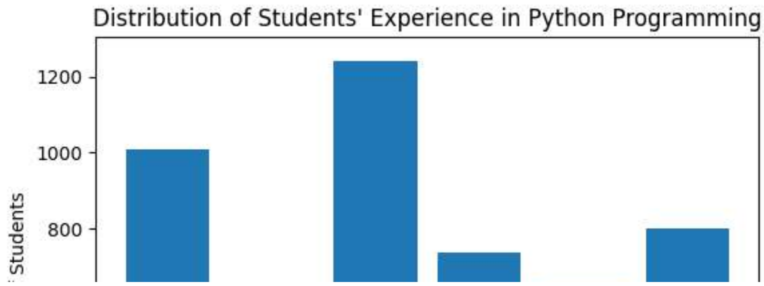


4. **What is the distribution of student’s experience with Python programming?**

```
experience_distribution = df['Experience with python (Months)'].value_counts()
print(experience_distribution)
```

```
5    1242
3    1008
8     800
6     738
7     640
4     466
Name: Experience with python (Months), dtype: int64
```

```
experience_distribution = experience_distribution.sort_index()
plt.bar(experience_distribution.index, experience_distribution.values)
plt.xticks(experience_distribution.index)
plt.xlabel('Experience with Python (Months)')
plt.ylabel('Number of Students')
plt.title('Distribution of Students\' Experience in Python Programming')
plt.show()
```



5. What is the average family income of the student?

```
income_mapping = {
    '0-2 Lakh': 2,
    '7 Lakh+': 7,
    '5-7 Lakh': 7,
    '2-5 Lakh': 5
}
df['Family Income'] = df['Family Income'].replace(income_mapping)


average_income = df['Family Income'].mean()

print("Average Family Income:", average_income)
```

```
Average Family Income: 2.2952595014303228
```

6. How does the average GPA vary among different colleges? ---Top 5

```
average_gpa_by_college = df.groupby('College Name')['CGPA'].mean().reset_index()
sorted_colleges = average_gpa_by_college.sort_values(by='CGPA', ascending=False)
top_5_colleges = sorted_colleges.head(5)
print(top_5_colleges)
```

```
                                         College Name      CGPA
23  THAKUR INSTITUTE OF MANAGEMENT STUDIES, CAREER...  8.585714
20                                St Xavier's College  8.578571
3   B. K. Birla College of Arts, Science & Commerc...  8.456410
22           Symbiosis Institute of Technology, Pune  8.303448
2                   AP SHAH INSTITUTE OF TECHNOLOGY   8.283333
```

7. Are there any outliers in the quantity (number of courses completed) attribute?

```
course_counts = df['Events'].value_counts()
Q1 = course_counts.quantile(0.25)
Q3 = course_counts.quantile(0.75)

# Calculate the Interquartile Range (IQR)
IQR = Q3 - Q1

# Calculate the lower and upper bounds to identify outliers
lower_bound = Q1 - 1.5 * IQR
upper_bound = Q3 + 1.5 * IQR

# Find outliers
outliers = course_counts[(course_counts < lower_bound) | (course_counts > upper_bound)]

print("Outliers in Quantity Obtained (Number of Students Taking Each Course):")
print(outliers)
```

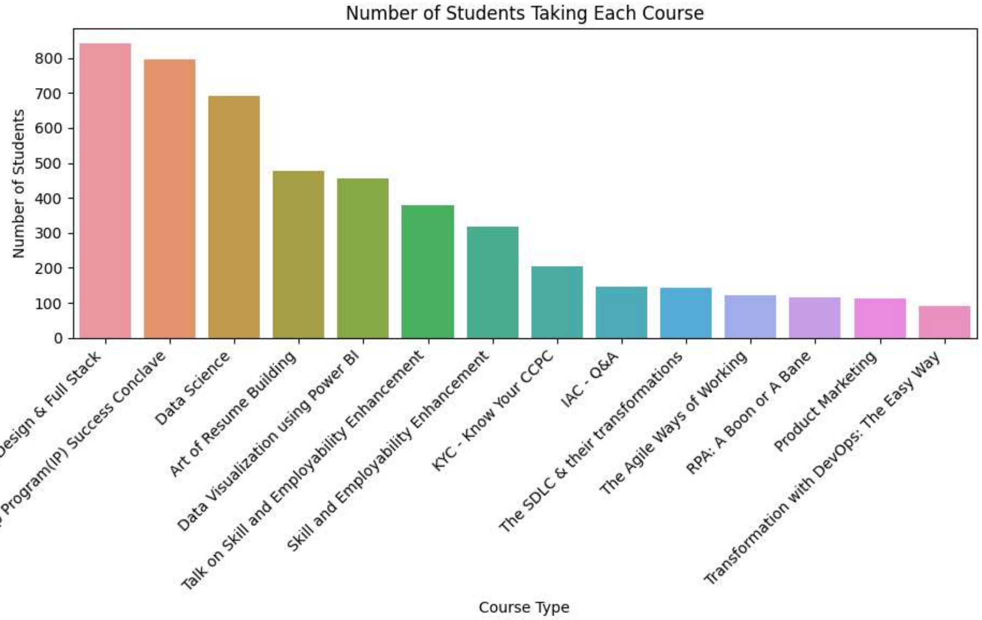
```
Outliers in Quantity Obtained (Number of Students Taking Each Course):
Series([], Name: Events, dtype: int64)
```

```
plt.figure(figsize=(10, 6))
sns.barplot(x=course_counts.index, y=course_counts.values)
plt.xlabel('Course Type')
plt.ylabel('Number of Students')
plt.title('Number of Students Taking Each Course')

# Highlight the outliers in red color
for idx in outliers.index:
    plt.text(course_counts.index.get_loc(idx), course_counts.loc[idx], f'{course_counts.loc[idx]} (Outlier)', color='red', ha='center', va='b

plt.xticks(rotation=45, ha='right')
plt.tight_layout()

# Display the plot
plt.show()
```



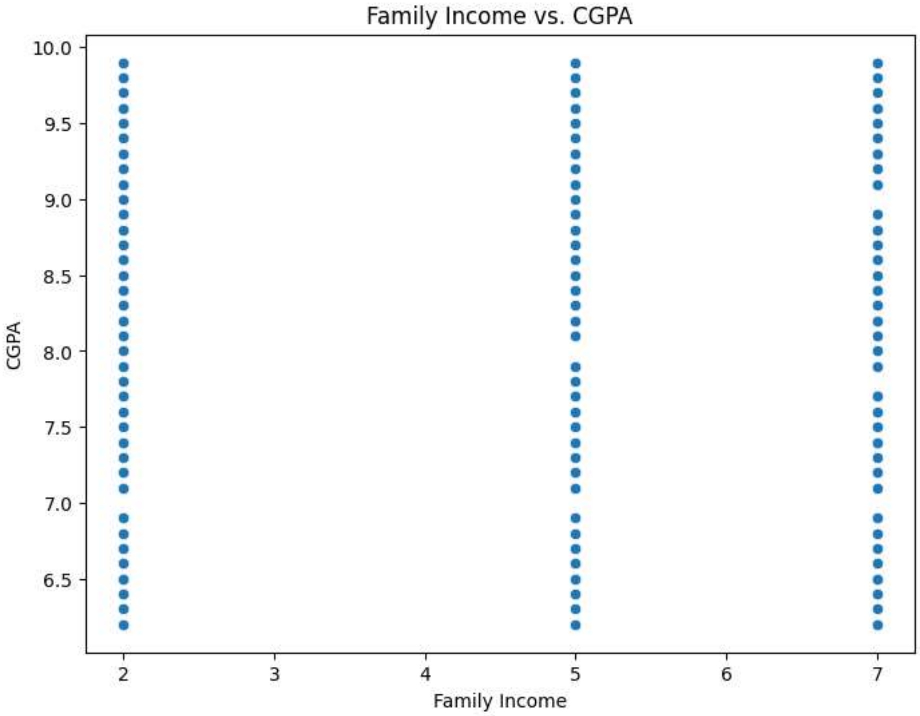
8. What is the average GPA for student from each city?

```
average_gpa_citywise = df.groupby('City')['CGPA'].mean()
print(average_gpa_citywise)
```

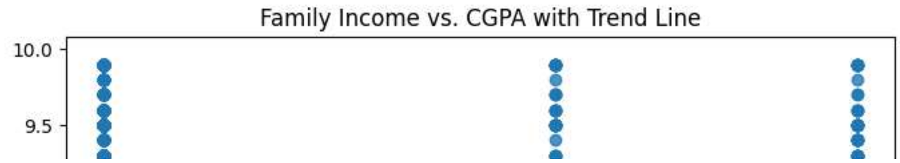
```
City
Agartala     7.660714
Agra         8.046429
Ahemdabad    8.190385
Ajmer        8.284314
Akola        8.021429
               ...
Vidisha      7.738095
Vijaywada    7.986364
Wardha       8.328571
konark       8.071429
kullu        7.878571
Name: CGPA, Length: 177, dtype: float64
```

9. Can we identify any relationship between family income and GPA?

```
plt.figure(figsize=(8, 6))
sns.scatterplot(x='Family Income', y='CGPA', data=df)
plt.xlabel('Family Income')
plt.ylabel('CGPA')
plt.title('Family Income vs. CGPA')
plt.show()
```



```
income_mapping = {
    '0-2 Lakh': 2,
    '7 Lakh+': 7,
    '5-7 Lakh': 7,
    '2-5 Lakh': 5
}
df['Family Income'] = df['Family Income'].replace(income_mapping)
plt.figure(figsize=(8, 6))
sns.regplot(x='Family Income', y='CGPA', data=df)
plt.xlabel('Family Income')
plt.ylabel('CGPA')
plt.title('Family Income vs. CGPA with Trend Line')
plt.show()
correlation_coefficient = df['Family Income'].corr(df['CGPA'])
print("Correlation Coefficient:", correlation_coefficient)
```



10. **How many students from various cities.(solve using data visualisation tool).**

```
city_counts = df['City'].value_counts()
city_counts_df = city_counts.reset_index()
city_counts_df.columns = ['City', 'Frequency']
print(city_counts_df)
```

```
             City  Frequency
0      Chandigarh         57
1           Siuri         56
2          Talmuk         56
3           Gonda         56
4           Sikar         52
5            Kota         52
6         Bikaner         52
7          Jaipur         52
8         Jhalwar         52
9         Jodhpur         52
10      Ahemdabad         52
11          Jalor         52
12           Pali         52
13         Amreli         52
14         Dwarka         52
15        Patiala         51
16         Barmer         51
17           Amer         51
18          Ajmer         51
19        Sangrur         51
20        Jalgaon         51
21       Amritsar         51
22       Buldhana         51
23     Aurangabad         51
24           Mahe         51
25       Bhandara         51
26        Bhsawal         51
27            Bid         51
28          Dhule         51
29         Kalyan         51
30          Thane         51
31    Navi Mumbai         51
32         Mumbai         51
33         Nagpur         51
34         Nanded         51
35         Godhra         50
36        Navsari         44
37         Valsad         44
38          Surat         44
39          Morbi         44
40          Kheda         44
41       Junagadh         44
42         Rajkot         44
43           Okha         44
44         Nadiad         44
45       Jamnagar         44
46         Ambala         43
47      Faridabad         43
48       Hamirpur         42
49         Ujjain         42
50          Sagar         42
51        Orchha          42
52          Satna         42
53          Akola         42
54        Vidisha         42
55       Mainpuri         28
56        Mathura         28
```

11. **How does the expected salary vary based on factors like CGPA,family Income, months of experience in python language?**

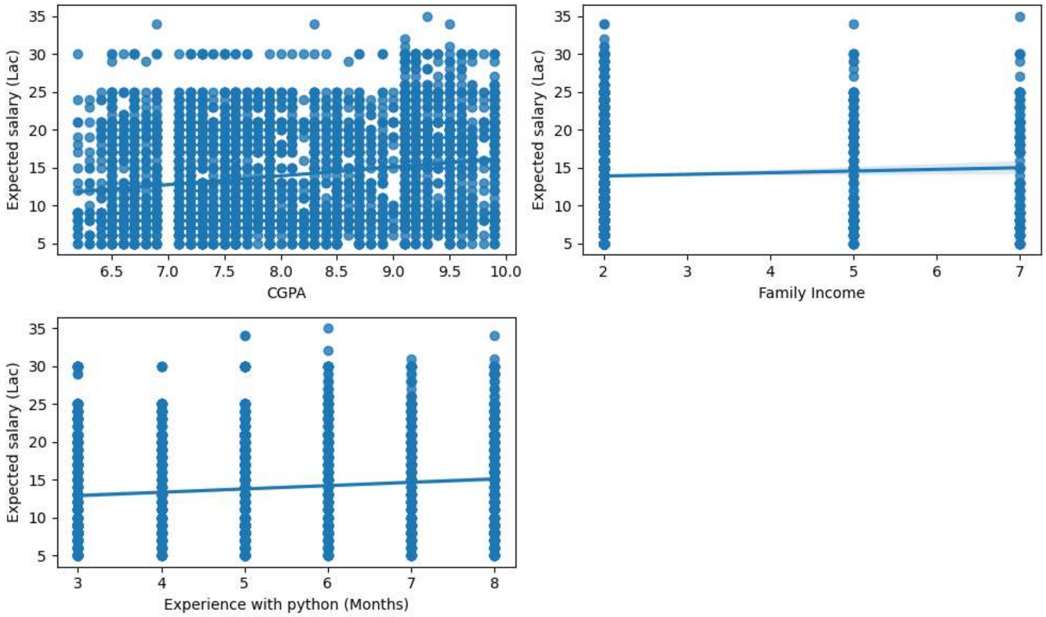
```
plt.figure(figsize=(10, 6))

plt.subplot(2, 2, 1)
sns.regplot(x='CGPA', y='Expected salary (Lac)', data=df)

plt.subplot(2, 2, 2)
sns.regplot(x='Family Income', y='Expected salary (Lac)', data=df)

plt.subplot(2, 2, 3)
sns.regplot(x='Experience with python (Months)', y='Expected salary (Lac)', data=df)

plt.tight_layout()
plt.show()
```



12.**This is similar as question no.7.**

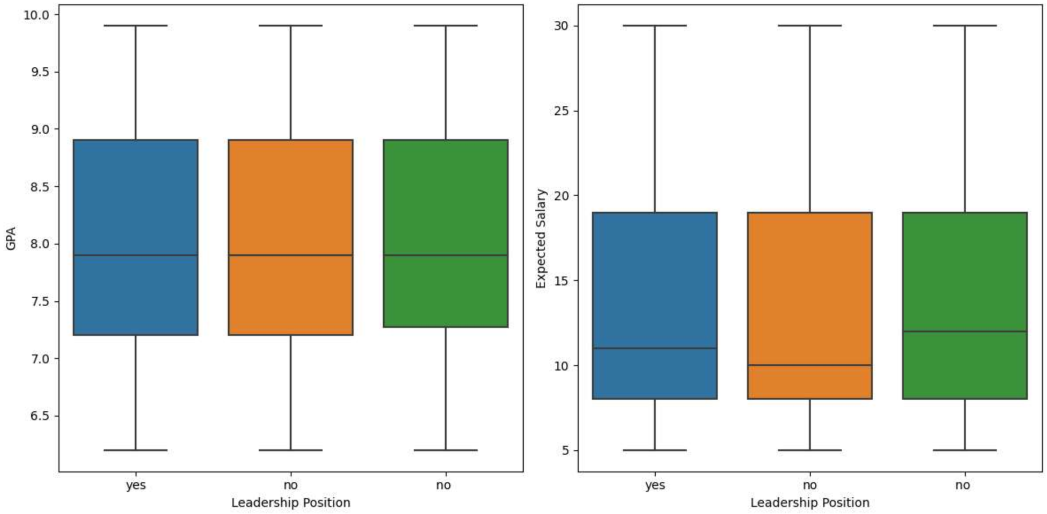
13. **Do students who are having leadership positions during their college years tend to have higher GPAs or better expected salary?**

```
plt.figure(figsize=(12, 6))
plt.subplot(1, 2, 1)
sns.boxplot(x='Leadership- skills', y='GPA', data=df)
plt.xlabel('Leadership Position')
plt.ylabel('GPA')

plt.subplot(1, 2, 2)
sns.boxplot(x='Leadership- skills', y='Expected salary (Lac)', data=df)
plt.xlabel('Leadership Position')
plt.ylabel('Expected Salary')

plt.tight_layout()

plt.show()
```



14. **It is same as second part of 13.**

15. **How many students are graduating by the end of 2024?**

```
graduating_before_2024 = df[df['Year of Graduation'] <= 2024]

# Count the number of students graduating on or before 2024
number_of_students = len(graduating_before_2024)

# Print or display the result
print("Number of students graduating on or before 2024:", number_of_students)
```

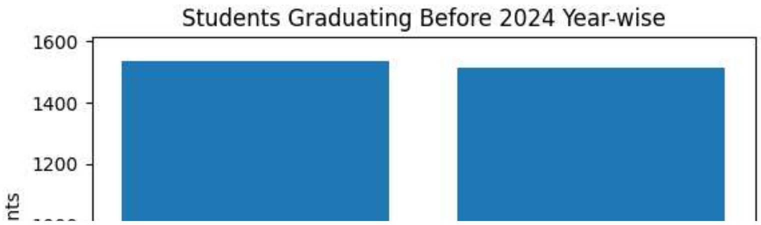
```
    Number of students graduating on or before 2024: 3047
```

```
graduating_before_2024 = df[df['Year of Graduation'] <= 2024]
year_counts = graduating_before_2024['Year of Graduation'].value_counts().sort_index()

# Create the plot
plt.bar(year_counts.index, year_counts.values)

# Set integer values on the x-axis
plt.xticks(year_counts.index, year_counts.index.astype(int))

plt.xlabel('Graduating Year')
plt.ylabel('Number of Students')
plt.title('Students Graduating Before 2024 Year-wise')
plt.show()
```



16. **Which marketing effects better in gaining attention from the students?**

```
social_media_counts = df['How did you come to know about this event?'].value_counts()

# Get the top 5 marketing channels with the highest counts
top_10_social_media = social_media_counts.head(10)

# Print or display the top 5 marketing channels
print(top_10_social_media)
```

```
    Whatsapp                                1067
    Email                                    438
    SPOC/ College Professor                  326
    Others                                   153
    Cloud Counselage Website                 129
    Whatsapp | SPOC/ College Professor        67
    LinkedIn                                  55
    Facebook                                  48
    Youtube                                   37
    Friend/ Classmate                         30
    Name: How did you come to know about this event?, dtype: int64
```

17. **Find the total number of students who attended the events related to Data Science.**

```
data_science_attendees = df[df['Events'] == 'Data Science']

# Count the number of students who attended the Data Science course
number_of_attendees = len(data_science_attendees)

# Print or display the result
print("Total number of students who attended the Data Science course:", number_of_attendees)
```

```
    Total number of students who attended the Data Science course: 693
```