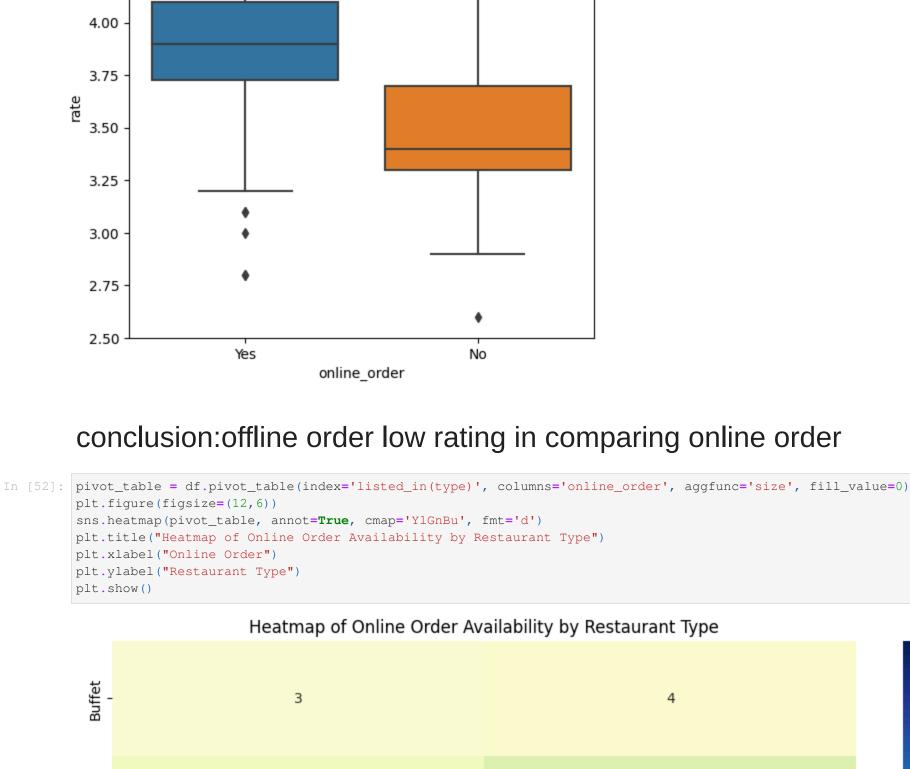
```
In [1]: !pip install pandas
       Requirement already satisfied: pandas in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (2.2.2)
       Requirement already satisfied: numpy>=1.26.0 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from pandas) (2.1.0)
       Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from pandas) (2.9.0.post0)
       Requirement already satisfied: pytz>=2020.1 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from pandas) (2024.1)
       Requirement already satisfied: tzdata>=2022.7 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from pandas) (2024.1)
       Requirement already satisfied: six >= 1.5 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from python-dateutil>=2.8.2->pandas) (1.16.0)
       [notice] A new release of pip is available: 23.2.1 -> 25.0.1
       [notice] To update, run: python.exe -m pip install --upgrade pip
In [2]: !pip install numpy
       Requirement already satisfied: numpy in c: \verb|lenovo| appdata| local| programs| python| python| 312 | lib| site-packages (2.1.0) | 
       [notice] A new release of pip is available: 23.2.1 -> 25.0.1
       [notice] To update, run: python.exe -m pip install --upgrade pip
 In [3]: !pip install seaborn
       Collecting seaborn
         Obtaining dependency information for seaborn from https://files.pythonhosted.org/packages/83/11/00d3c3dfc25ad54e731d91449895a79e4bf2384dc3ac01809010ba88f6d5/seaborn-0.13.2-py3-none-any.whl.metadata
        Downloading seaborn-0.13.2-py3-none-any.whl.metadata (5.4 kB)
       Requirement already satisfied: numpy!=1.24.0,>=1.20 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from seaborn) (2.1.0)
       Requirement already satisfied: pandas>=1.2 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from seaborn) (2.2.2)
       Collecting matplotlib!=3.6.1,>=3.4 (from seaborn)
        Obtaining dependency information for matplotlib!=3.6.1,>=3.4 from https://files.pythonhosted.org/packages/a6/b6/a9405484fb40746fdc6ae4502b16a9d6e53282ba5baaf9ebe2da579f68c4/matplotlib-3.10.1-cp312-cp312-win_amd64.whl.metadata
        Downloading matplotlib-3.10.1-cp312-cp312-win_amd64.whl.metadata (11 kB)
       Collecting contourpy>=1.0.1 (from matplotlib!=3.6.1,>=3.4->seaborn)
        Obtaining dependency information for contourpy>=1.0.1 from https://files.pythonhosted.org/packages/a1/35/c2de8823211d07e8a79ab018ef03960716c5dff6f4d5bff5af87fd682992/contourpy-1.3.1-cp312-cp312-win_amd64.whl.metadata
        Downloading contourpy-1.3.1-cp312-cp312-win_amd64.whl.metadata (5.4 kB)
       Collecting cycler>=0.10 (from matplotlib!=3.6.1,>=3.4->seaborn)
        Obtaining dependency information for cycler>=0.10 from https://files.pythonhosted.org/packages/e7/05/c19819d5e3d95294a6f5947fb9b9629efb316b96de511b418c53d245aae6/cycler-0.12.1-py3-none-any.whl.metadata
         Using cached cycler-0.12.1-py3-none-any.whl.metadata (3.8 kB)
       Collecting fonttools>=4.22.0 (from matplotlib!=3.6.1,>=3.4->seaborn)
         Obtaining dependency information for fonttools>=4.22.0 from https://files.pythonhosted.org/packages/6f/e3/5a181a85777f7809076e51f7422e0dc77eb04676c40ec8bf6a49d390d1ff/fonttools-4.56.0-cp312-cp312-win_amd64.whl.metadata
         Downloading fonttools-4.56.0-cp312-cp312-win_amd64.whl.metadata (103 kB)
            ----- 0.0/104.0 kB ? eta -:--:--
            ----- 61.4/104.0 kB 1.7 MB/s eta 0:00:01
            ----- 102.4/104.0 kB 980.4 kB/s eta 0:00:01
            ----- 104.0/104.0 kB 600.8 kB/s eta 0:00:00
       Collecting kiwisolver>=1.3.1 (from matplotlib!=3.6.1,>=3.4->seaborn)
        Obtaining dependency information for kiwisolver>=1.3.1 from https://files.pythonhosted.org/packages/bd/72/dfff0cc97f2a0776e1c9eb5bef1ddfd45f46246c6533b0191887a427bca5/kiwisolver-1.4.8-cp312-cp312-win_amd64.whl.metadata
         Downloading kiwisolver-1.4.8-cp312-cp312-win_amd64.whl.metadata (6.3 kB)
       Collecting packaging>=20.0 (from matplotlib!=3.6.1,>=3.4->seaborn)
         Obtaining dependency information for packaging>=20.0 from https://files.pythonhosted.org/packages/88/ef/eb23f262cca3c0c4eb7ab1933c3b1f03d021f2c48f54763065b6f0e321be/packaging-24.2-py3-none-any.whl.metadata
        Downloading packaging-24.2-py3-none-any.whl.metadata (3.2 kB)
       Collecting pillow>=8 (from matplotlib!=3.6.1,>=3.4->seaborn)
         Obtaining dependency information for pillow>=8 from https://files.pythonhosted.org/packages/08/5c/2104299949b9d504baf3f4d35f73dbd14ef31bbd1ddc2c1b66a5b7dfda44/pillow-11.1.0-cp312-cp312-win_amd64.whl.metadata
         Downloading pillow-11.1.0-cp312-cp312-win_amd64.whl.metadata (9.3 kB)
       Collecting pyparsing>=2.3.1 (from matplotlib!=3.6.1,>=3.4->seaborn)
        Obtaining dependency information for pyparsing>=2.3.1 from https://files.pythonhosted.org/packages/05/e7/df2285f3d08fee213f2d041540fa4fc9ca6c2d44cf36d3a035bf2a8d2bcc/pyparsing-3.2.3-py3-none-any.whl.metadata
        Downloading pyparsing-3.2.3-py3-none-any.whl.metadata (5.0 kB)
       Requirement already satisfied: python-dateutil>=2.7 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from matplotlib!=3.6.1,>=3.4->seaborn) (2.9.0.post0)
       Requirement already satisfied: pytz>=2020.1 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from pandas>=1.2->seaborn) (2024.1)
       Requirement already satisfied: tzdata>=2022.7 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from pandas>=1.2->seaborn) (2024.1)
       Requirement already satisfied: six>=1.5 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from python-dateutil>=2.7->matplotlib!=3.6.1,>=3.4->seaborn) (1.16.0)
       Downloading seaborn-0.13.2-py3-none-any.whl (294 kB)
          ----- 0.0/294.9 kB ? eta -:--:-
          ----- 143.4/294.9 kB 4.3 MB/s eta 0:00:01
          ----- 235.5/294.9 kB 3.6 MB/s eta 0:00:01
          ----- 286.7/294.9 kB 2.5 MB/s eta 0:00:01
          ----- 294.9/294.9 kB 1.7 MB/s eta 0:00:00
       Downloading matplotlib-3.10.1-cp312-cp312-win_amd64.whl (8.1 MB)
          ----- 0.0/8.1 MB ? eta -:--:-
          - ----- 0.3/8.1 MB 7.0 MB/s eta 0:00:02
          -- ----- 0.6/8.1 MB 5.9 MB/s eta 0:00:02
          ---- 0.9/8.1 MB 7.0 MB/s eta 0:00:02
          ---- 1.1/8.1 MB 6.5 MB/s eta 0:00:02
          ----- 1.4/8.1 MB 6.5 MB/s eta 0:00:02
          ------ 1.7/8.1 MB 6.4 MB/s eta 0:00:01
          ----- 1.9/8.1 MB 6.8 MB/s eta 0:00:01
          ----- 2.3/8.1 MB 6.6 MB/s eta 0:00:01
          ----- 2.6/8.1 MB 6.6 MB/s eta 0:00:01
          ----- 2.9/8.1 MB 6.8 MB/s eta 0:00:01
          ----- 3.2/8.1 MB 6.7 MB/s eta 0:00:01
          ----- 3.6/8.1 MB 6.8 MB/s eta 0:00:01
          ----- 3.8/8.1 MB 6.6 MB/s eta 0:00:01
          ----- 4.2/8.1 MB 6.8 MB/s eta 0:00:01
          ----- 4.4/8.1 MB 6.7 MB/s eta 0:00:01
          ----- 4.7/8.1 MB 6.6 MB/s eta 0:00:01
          ----- 4.9/8.1 MB 6.7 MB/s eta 0:00:01
          ----- 5.2/8.1 MB 6.7 MB/s eta 0:00:01
          ----- 5.5/8.1 MB 6.6 MB/s eta 0:00:01
          ----- 5.7/8.1 MB 6.6 MB/s eta 0:00:01
          ----- 5.8/8.1 MB 6.4 MB/s eta 0:00:01
          ----- 6.0/8.1 MB 6.2 MB/s eta 0:00:01
          ----- 6.1/8.1 MB 6.1 MB/s eta 0:00:01
          ----- 6.3/8.1 MB 6.1 MB/s eta 0:00:01
          ----- 6.3/8.1 MB 5.9 MB/s eta 0:00:01
          ----- 6.7/8.1 MB 5.9 MB/s eta 0:00:01
          ----- 7.0/8.1 MB 5.9 MB/s eta 0:00:01
          ----- 7.2/8.1 MB 5.9 MB/s eta 0:00:01
          ----- 7.5/8.1 MB 6.0 MB/s eta 0:00:01
          ----- 7.8/8.1 MB 6.0 MB/s eta 0:00:01
          ----- 8.1/8.1 MB 6.0 MB/s eta 0:00:01
          ----- 8.1/8.1 MB 6.0 MB/s eta 0:00:01
          ------ 8.1/8.1 MB 6.0 MB/s eta 0:00:01
          ----- 8.1/8.1 MB 6.0 MB/s eta 0:00:01
          ----- 8.1/8.1 MB 5.3 MB/s eta 0:00:00
       Downloading contourpy-1.3.1-cp312-cp312-win_amd64.whl (220 kB)
          ----- 0.0/221.0 kB ? eta -:--:--
          --- 20.5/221.0 kB 640.0 kB/s eta 0:00:01
          ----- -- 204.8/221.0 kB 3.1 MB/s eta 0:00:01
          ----- 215.0/221.0 kB 2.6 MB/s eta 0:00:01
          ----- - 215.0/221.0 kB 2.6 MB/s eta 0:00:01
          ----- 221.0/221.0 kB 1.4 MB/s eta 0:00:00
       Using cached cycler-0.12.1-py3-none-any.whl (8.3 kB)
       Downloading fonttools-4.56.0-cp312-cp312-win_amd64.whl (2.2 MB)
         ----- 0.0/2.2 MB ? eta -:--:-
         ----- 0.6/2.2 MB 18.2 MB/s eta 0:00:01
          ----- 0.8/2.2 MB 10.2 MB/s eta 0:00:01
          ----- 1.1/2.2 MB 9.1 MB/s eta 0:00:01
          ----- 1.4/2.2 MB 8.9 MB/s eta 0:00:01
          ----- 1.7/2.2 MB 8.4 MB/s eta 0:00:01
          ----- 2.1/2.2 MB 7.9 MB/s eta 0:00:01
          ----- 2.2/2.2 MB 7.7 MB/s eta 0:00:01
          ----- 2.2/2.2 MB 6.3 MB/s eta 0:00:00
       Downloading kiwisolver-1.4.8-cp312-cp312-win_amd64.whl (71 kB)
          ----- 0.0/71.9 kB ? eta -:--:-
          ----- 71.7/71.9 kB 2.0 MB/s eta 0:00:01
          ----- 71.9/71.9 kB 789.9 kB/s eta 0:00:00
       Downloading packaging-24.2-py3-none-any.whl (65 kB)
          ----- 0.0/65.5 kB ? eta -:--:-
          ----- -- 61.4/65.5 kB ? eta -:--:-
          ----- -- 61.4/65.5 kB ? eta -:--:-
          ----- 65.5/65.5 kB 506.5 kB/s eta 0:00:00
       Downloading pillow-11.1.0-cp312-cp312-win_amd64.whl (2.6 MB)
          ----- 0.0/2.6 MB ? eta -:--:-
          --- 0.2/2.6 MB 5.0 MB/s eta 0:00:01
          ---- 0.3/2.6 MB 5.3 MB/s eta 0:00:01
          ----- 0.6/2.6 MB 4.3 MB/s eta 0:00:01
          ----- 0.6/2.6 MB 4.0 MB/s eta 0:00:01
          ----- 0.8/2.6 MB 3.9 MB/s eta 0:00:01
          ----- 0.9/2.6 MB 3.7 MB/s eta 0:00:01
          ----- 1.0/2.6 MB 3.7 MB/s eta 0:00:01
          ----- 1.4/2.6 MB 4.1 MB/s eta 0:00:01
          ------ 1.6/2.6 MB 4.2 MB/s eta 0:00:01
          ----- 2.1/2.6 MB 4.6 MB/s eta 0:00:01
          ----- 2.4/2.6 MB 4.8 MB/s eta 0:00:01
          ----- 2.6/2.6 MB 2.9 MB/s eta 0:00:00
       Downloading pyparsing-3.2.3-py3-none-any.whl (111 kB)
          ----- 0.0/111.1 kB ? eta -:--:-
          ----- 102.4/111.1 kB 5.8 MB/s eta 0:00:01
          ----- 111.1/111.1 kB 1.3 MB/s eta 0:00:00
       Installing collected packages: pyparsing, pillow, packaging, kiwisolver, fonttools, cycler, contourpy, matplotlib, seaborn
       Successfully installed contourpy-1.3.1 cycler-0.12.1 fonttools-4.56.0 kiwisolver-1.4.8 matplotlib-3.10.1 packaging-24.2 pillow-11.1.0 pyparsing-3.2.3 seaborn-0.13.2
       [notice] A new release of pip is available: 23.2.1 -> 25.0.1
       [notice] To update, run: python.exe -m pip install --upgrade pip
In [6]: !pip install matplotlib
       Requirement already satisfied: matplotlib in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (3.10.1)
       Requirement already satisfied: contourpy>=1.0.1 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from matplotlib) (1.3.1)
       Requirement already satisfied: cycler>=0.10 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from matplotlib) (0.12.1)
       Requirement already satisfied: fonttools>=4.22.0 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from matplotlib) (4.56.0)
       Requirement already satisfied: kiwisolver>=1.3.1 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from matplotlib) (1.4.8)
       Requirement already satisfied: numpy>=1.23 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from matplotlib) (2.1.0)
       Requirement already satisfied: packaging>=20.0 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from matplotlib) (24.2)
       Requirement already satisfied: pillow>=8 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from matplotlib) (11.1.0)
       Requirement already satisfied: pyparsing>=2.3.1 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from matplotlib) (3.2.3)
       Requirement already satisfied: python-dateutil>=2.7 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from matplotlib) (2.9.0.post0)
       Requirement already satisfied: six>=1.5 in c:\users\lenovo\appdata\local\programs\python\python312\lib\site-packages (from python-dateutil>=2.7->matplotlib) (1.16.0)
       [notice] A new release of pip is available: 23.2.1 -> 25.0.1
       [notice] To update, run: python.exe -m pip install --upgrade pip
 In [7]: import pandas as pd
        import numpy as np
        import matplotlib.pyplot as plt
        import seaborn as sns
In [12]: df=pd.read_csv("zz.csv")
In [13]: df
Out[13]:
                                                  rate votes approx_cost(for two people) listed_in(type)
                         name online_order book_table
                                               Yes 4.1/5 775
                         Jalsa
                  Spice Elephant
                                     Yes
                                               No 4.1/5 787
                                                                                          Buffet
                 San Churro Cafe
                                     Yes
                                               No 3.8/5
                                                                                          Buffet
          3 Addhuri Udupi Bhojana
                                               No 3.7/5
                                                                                          Buffet
                                                                               600
                   Grand Village
                                      No
                                               No 3.8/5
                                                                                          Buffet
        143
                 Melting Melodies
                                               No 3.3/5
                                                                               100
                                                                                         Dining
                 New Indraprasta
                                               No 3.3/5
                                                                                         Dining
        145
                   Anna Kuteera
                                     Yes
                                                                               450
                                               No 4.0/5
        146
                                               No 3.0/5
                                                                                         Dining
        147
                   Vijayalakshmi
                                               No 3.9/5
        148 rows × 7 columns
In [14]: df.info()
       <class 'pandas.core.frame.DataFrame'>
       RangeIndex: 148 entries, 0 to 147
       Data columns (total 7 columns):
                                      Non-Null Count Dtype
        # Column
                                      148 non-null object
        0
           name
                                  148 non-null object
           online_order
           book_table
                                      148 non-null object
                                      148 non-null object
           rate
                                      148 non-null int64
           votes
           approx_cost(for two people) 148 non-null int64
           listed_in(type)
                                      148 non-null
       dtypes: int64(2), object(5)
       memory usage: 8.2+ KB
        CONVERT DATATYPE COLOMN RATE
In [24]: df['rate'] = df['rate'].astype(str).replace(r'/5', '', regex=True).apply(lambda x: x.strip())
        df['rate'] = pd.to_numeric(df['rate'], errors='coerce')
       df
                         name online_order book_table rate votes approx_cost(for two people)
                                                                                  listed_in(type)
                                               Yes 4.1
          0
                         Jalsa
                                                        775
                                                                                         Buffet
                  Spice Elephant
                                     Yes
                                               No 4.1 787
                                                                               800
                                                                                         Buffet
                 San Churro Cafe
                                     Yes
                                               No 3.8
                                                                               800
                                                                                         Buffet
          3 Addhuri Udupi Bhojana
                                               No 3.7
                                                                               300
                                                                                         Buffet
                                                                               600
                   Grand Village
                                      No
                                                   3.8
                                                                                         Buffet
                 Melting Melodies
        143
                                               No 3.3
                                                                               100
                                                                                         Dining
        144
                 New Indraprasta
                                               No 3.3
                                                                               150
                                                                                         Dining
                                                                               450
        145
                   Anna Kuteera
                                     Yes
                                               No
                                                  4.0
                                                        771
                                                                                         Dining
        146
                        Darbar
                                               No 3.0
                                                                                         Dining
        147
                   Vijayalakshmi
                                               No 3.9
                                                                               200
        148 rows × 7 columns
In [27]: df.info()
       <class 'pandas.core.frame.DataFrame'>
       RangeIndex: 148 entries, 0 to 147
       Data columns (total 7 columns):
                                      Non-Null Count Dtype
        # Column
                                      _____
                                      148 non-null object
           name
                                      148 non-null object
           online_order
       2 book_table
                                      148 non-null object
                                      148 non-null float64
       3
           rate
                                      148 non-null int64
        5 approx_cost(for two people) 148 non-null int64
        6 listed_in(type)
                                      148 non-null object
       dtypes: float64(1), int64(2), object(4)
       memory usage: 8.2+ KB
        type of resturant
In [28]: df.head(5)
                       name online_order book_table rate votes approx_cost(for two people) listed_in(type)
                                             Yes 4.1 775
                                                                                        Buffet
                       Jalsa
                Spice Elephant
                                             No 4.1 787
                                                                             800
                                                                                       Buffet
               San Churro Cafe
                                             No 3.8
                                                      918
                                                                             800
                                                                                        Buffet
                                                                             300
        3 Addhuri Udupi Bhojana
                                             No 3.7
                                                                                        Buffet
                  Grand Village
                                                                             600
                                             No 3.8
                                                                                        Buffet
In [31]: plt.figure(figsize=(10,5))
        sns.countplot(x='listed_in(type)', data=df, order=df['listed_in(type)'].value_counts().index, palette='coolwarm')
        plt.xticks(rotation=45)
        plt.title("Distribution of Restaurant Types")
        plt.xlabel("Restaurant Type")
        plt.ylabel("Count")
        plt.show()
                                            Distribution of Restaurant Types
          100
           80
           40
           20
                                                      Restaurant Type
        majority of customer order by dining resturant
In [40]: group_data = df.groupby('listed_in(type)')['votes'].sum()
        result = pd.DataFrame({'votes': group_data})
        plt.figure(figsize=(12,6))
        plt.plot(result, color='green', marker='o')
        plt.xlabel('Type of Restaurant', color='red', fontsize=20)
        plt.ylabel('Votes', color='red', fontsize=20)
        plt.title("Total Votes by Restaurant Type")
        plt.xticks(rotation=45)
        plt.show()
                                                          Total Votes by Restaurant Type
            20000
            17500
            15000
        Votes
            12500
            10000
             7500
            5000
            2500
                                                          Type of Restaurant
        conclusion:dinning resturent has recieved maximum vote
In [41]: plt.hist(df['rate'],bins=5)
        plt.title('rating distribution')
        plt.show()
                               rating distribution
        50
        40
        30
        20
        10
                                  3.50 3.75 4.00
                                                       4.25
              2.75 3.00
                            3.25
        conclusion: The majority of resturant recieved rating 3.5 to 4
        average order spending by couple
 In [ ]: couple_data=df['approx_cost(for two people)']
        sns.countplot(x=couple_data)
Out[]: <Axes: xlabel='approx_cost(for two people)', ylabel='count'>
          20
```

100 150 200 250 300 350 400 450 500 550 600 650 700 750 800 850 900 950 approx_cost(for two people) conclusion: the majority of couples preffre resturant with an approximate cost of 300 repees In [49]: plt.figure(figsize=(6,6)) sns.boxplot(x='online_order', y='rate', data=df) Out[49]: <Axes: xlabel='online_order', ylabel='rate'>

4.50

4.25

3.75



15 Dining 77 33 - 30 - 20 2 6 - 10 No Yes Online Order conclusion: The heatmap highlights the distribution of online orders across different restaurant categories, showing patterns in customer

preferences.")