```
pip install pandas
```

```
Requirement already satisfied: pandas in c:\users\shiva\appdata\local\
packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (2.3.3)
Requirement already satisfied: numpy>=1.23.2 in c:\users\shiva\
appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from pandas) (2.3.4)
Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\
shiva\appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from pandas) (2.9.0.post0)
Requirement already satisfied: pytz>=2020.1 in c:\users\shiva\appdata\
local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (from pandas)
(2025.2)
Requirement already satisfied: tzdata>=2022.7 in c:\users\shiva\
appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from pandas) (2025.2)
Requirement already satisfied: six>=1.5 in c:\users\shiva\appdata\
local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (from python-
dateutil>=2.8.2->pandas) (1.17.0)
Note: you may need to restart the kernel to use updated packages.


[notice] A new release of pip is available: 24.0 -> 25.3
[notice] To update, run: C:\Users\Shiva\AppData\Local\Microsoft\
WindowsApps\PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\
python.exe -m pip install --upgrade pip
```

```
import pandas as pd
```

```
df=pd.read_csv(r"C:\Users\Shiva\OneDrive\Documents\
Black_Friday_Lulu_Mall_Sales.csv")
```

```
pd
```

```
<module 'pandas' from 'C:\\Users\\Shiva\\AppData\\Local\\Packages\\
PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\\LocalCache\\local-
packages\\Python311\\site-packages\\pandas\\__init__.py'>
```

```
df
```

```
    Customer_ID             Name  Gender  Age                  City  \
0             1    Robert Foster  Female   60             Port Ian
1             2      Ariel Curry  Female   59           Lake Renee
2             3  Joseph Crawford   Other   38       West Tashafort
3             4       Melody May   Other   41         Patriciaview
```

```
4              5      Terri Baker    Male   46          Michaelaside
..           ...               ...     ...  ...                   ...
95            96      Joshua Boyd    Male   54              Smithstad
96            97     Tony Spencer    Male   48  South Tiffanychester
97            98    Heather Reyes   Other   51              Philipton
98            99       Todd Novak    Male   58             Wilsontown
99           100    Maria Cabrera    Male   58           South Kayla

    Items_Purchased  Total_Spent(₹) Payment_Method Visited_Store  \
0                 8            8248      Gift Card     Lulu Mall
1                 5           39404           Cash     Lulu Mall
2                 9           48355    Credit Card     Lulu Mall
3                 2           39748    Credit Card     Lulu Mall
4                10           19551            UPI     Lulu Mall
..              ...             ...            ...           ...
95                5           10126    Credit Card     Lulu Mall
96                7           10084      Gift Card     Lulu Mall
97                6           27546      Gift Card     Lulu Mall
98                5           42109           Cash     Lulu Mall
99               10           46449     Debit Card     Lulu Mall

                Event        Date
0   Black Friday Sale  02-11-2024
1   Black Friday Sale  12-02-2025
2   Black Friday Sale  02-06-2025
3   Black Friday Sale  27-09-2025
4   Black Friday Sale  04-10-2025
..                ...         ...
95  Black Friday Sale  11-09-2025
96  Black Friday Sale  27-11-2024
97  Black Friday Sale  10-01-2025
98  Black Friday Sale  01-06-2025
99  Black Friday Sale  19-10-2025

[100 rows x 11 columns]

df.head()

   Customer_ID             Name  Gender  Age            City
Items_Purchased  \
0            1    Robert Foster  Female   60        Port Ian
8
1            2      Ariel Curry  Female   59      Lake Renee
5
2            3  Joseph Crawford   Other   38  West Tashafort
9
3            4       Melody May   Other   41    Patriciaview
2
4            5      Terri Baker    Male   46    Michaelaside
10
```

```
   Total_Spent(₹) Payment_Method Visited_Store              Event
Date
0            8248      Gift Card     Lulu Mall  Black Friday Sale  02-
11-2024
1           39404           Cash     Lulu Mall  Black Friday Sale  12-
02-2025
2           48355    Credit Card     Lulu Mall  Black Friday Sale  02-
06-2025
3           39748    Credit Card     Lulu Mall  Black Friday Sale  27-
09-2025
4           19551            UPI     Lulu Mall  Black Friday Sale  04-
10-2025

df.tail()

    Customer_ID           Name Gender  Age                  City  \
95           96    Joshua Boyd   Male   54             Smithstad
96           97   Tony Spencer   Male   48  South Tiffanychester
97           98  Heather Reyes  Other   51             Philipton
98           99     Todd Novak   Male   58            Wilsontown
99          100  Maria Cabrera   Male   58           South Kayla

    Items_Purchased  Total_Spent(₹) Payment_Method Visited_Store  \
95                5           10126    Credit Card     Lulu Mall
96                7           10084      Gift Card     Lulu Mall
97                6           27546      Gift Card     Lulu Mall
98                5           42109           Cash     Lulu Mall
99               10           46449     Debit Card     Lulu Mall

                 Event        Date
95  Black Friday Sale  11-09-2025
96  Black Friday Sale  27-11-2024
97  Black Friday Sale  10-01-2025
98  Black Friday Sale  01-06-2025
99  Black Friday Sale  19-10-2025

df.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 100 entries, 0 to 99
Data columns (total 11 columns):
 #   Column           Non-Null Count  Dtype
---  ------           --------------  -----
 0   Customer_ID      100 non-null    int64
 1   Name             100 non-null    object
 2   Gender           100 non-null    object
 3   Age              100 non-null    int64
 4   City             100 non-null    object
 5   Items_Purchased  100 non-null    int64
```

```
 6   Total_Spent(₹)   100 non-null    int64
 7   Payment_Method   100 non-null    object
 8   Visited_Store    100 non-null    object
 9   Event            100 non-null    object
 10  Date             100 non-null    object
dtypes: int64(4), object(7)
memory usage: 8.7+ KB
```

```
df.describe()
```

```
       Customer_ID         Age  Items_Purchased  Total_Spent(₹)
count   100.000000  100.000000       100.000000      100.000000
mean     50.500000   40.240000         7.800000    24660.170000
std      29.011492   11.776642         4.010088    13448.546596
min       1.000000   18.000000         1.000000     1015.000000
25%      25.750000   31.000000         4.750000    12658.500000
50%      50.500000   41.000000         8.000000    23835.000000
75%      75.250000   50.250000        10.250000    35644.000000
max     100.000000   60.000000        15.000000    49544.000000
```

```
df.shape
```

```
(100, 11)
```

```
df.columns
```

```
Index(['Customer_ID', 'Name', 'Gender', 'Age', 'City',
'Items_Purchased',
       'Total_Spent(₹)', 'Payment_Method', 'Visited_Store', 'Event',
'Date'],
      dtype='object')
```

```
df.values
```

```
array([[1, 'Robert Foster', 'Female', ..., 'Lulu Mall',
        'Black Friday Sale', '02-11-2024'],
       [2, 'Ariel Curry', 'Female', ..., 'Lulu Mall',
        'Black Friday Sale', '12-02-2025'],
       [3, 'Joseph Crawford', 'Other', ..., 'Lulu Mall',
        'Black Friday Sale', '02-06-2025'],
       ...,
       [98, 'Heather Reyes', 'Other', ..., 'Lulu Mall',
        'Black Friday Sale', '10-01-2025'],
       [99, 'Todd Novak', 'Male', ..., 'Lulu Mall', 'Black Friday
Sale',
        '01-06-2025'],
       [100, 'Maria Cabrera', 'Male', ..., 'Lulu Mall',
        'Black Friday Sale', '19-10-2025']], shape=(100, 11),
dtype=object)
```

```
df.dtypes
```

```
Customer_ID         int64
Name               object
Gender             object
Age                 int64
City               object
Items_Purchased     int64
Total_Spent(₹)      int64
Payment_Method     object
Visited_Store      object
Event              object
Date               object
dtype: object
```

```
df.loc[0]
```

```
Customer_ID                          1
Name                    Robert Foster
Gender                         Female
Age                                60
City                         Port Ian
Items_Purchased                     8
Total_Spent(₹)                   8248
Payment_Method              Gift Card
Visited_Store               Lulu Mall
Event               Black Friday Sale
Date                       02-11-2024
Name: 0, dtype: object
```

```
df.iloc[0,1]
```

```
'Robert Foster'
```

```
filtered_df = df.query('Age>30')
filtered_df
```

```
    Customer_ID             Name  Gender  Age                    City  \
0             1    Robert Foster  Female   60             Port Ian
1             2      Ariel Curry  Female   59           Lake Renee
2             3  Joseph Crawford   Other   38       West Tashafort
3             4       Melody May   Other   41         Patriciaview
4             5      Terri Baker    Male   46         Michaelaside
..          ...              ...     ...  ...                  ...
95           96      Joshua Boyd    Male   54             Smithstad
96           97     Tony Spencer    Male   48  South Tiffanychester
97           98    Heather Reyes   Other   51             Philipton
98           99       Todd Novak    Male   58           Wilsontown
99          100    Maria Cabrera    Male   58          South Kayla

    Items_Purchased  Total_Spent(₹) Payment_Method Visited_Store  \
0                 8            8248      Gift Card     Lulu Mall
1                 5           39404           Cash     Lulu Mall
```

```
2                 9           48355    Credit Card     Lulu Mall
3                 2           39748    Credit Card     Lulu Mall
4                10           19551            UPI     Lulu Mall
..              ...             ...            ...           ...
95                5           10126    Credit Card     Lulu Mall
96                7           10084      Gift Card     Lulu Mall
97                6           27546      Gift Card     Lulu Mall
98                5           42109           Cash     Lulu Mall
99               10           46449     Debit Card     Lulu Mall

                 Event        Date
0   Black Friday Sale  02-11-2024
1   Black Friday Sale  12-02-2025
2   Black Friday Sale  02-06-2025
3   Black Friday Sale  27-09-2025
4   Black Friday Sale  04-10-2025
..                ...         ...
95  Black Friday Sale  11-09-2025
96  Black Friday Sale  27-11-2024
97  Black Friday Sale  10-01-2025
98  Black Friday Sale  01-06-2025
99  Black Friday Sale  19-10-2025

[76 rows x 11 columns]
```

```
df_dropped=df.drop(columns=['Age'])
df_dropped
```

```
    Customer_ID             Name  Gender                  City  \
0             1    Robert Foster  Female             Port Ian
1             2      Ariel Curry  Female           Lake Renee
2             3  Joseph Crawford   Other        West Tashafort
3             4       Melody May   Other          Patriciaview
4             5      Terri Baker    Male          Michaelaside
..          ...              ...     ...                   ...
95           96      Joshua Boyd    Male              Smithstad
96           97     Tony Spencer    Male  South Tiffanychester
97           98    Heather Reyes   Other             Philipton
98           99       Todd Novak    Male            Wilsontown
99          100    Maria Cabrera    Male           South Kayla

    Items_Purchased  Total_Spent(₹) Payment_Method Visited_Store  \
0                 8            8248      Gift Card     Lulu Mall
1                 5           39404           Cash     Lulu Mall
2                 9           48355    Credit Card     Lulu Mall
3                 2           39748    Credit Card     Lulu Mall
4                10           19551            UPI     Lulu Mall
..              ...             ...            ...           ...
95                5           10126    Credit Card     Lulu Mall
96                7           10084      Gift Card     Lulu Mall
```

```
97                6           27546      Gift Card     Lulu Mall
98                5           42109           Cash     Lulu Mall
99               10           46449     Debit Card     Lulu Mall

                  Event        Date
0   Black Friday Sale  02-11-2024
1   Black Friday Sale  12-02-2025
2   Black Friday Sale  02-06-2025
3   Black Friday Sale  27-09-2025
4   Black Friday Sale  04-10-2025
..                ...         ...
95  Black Friday Sale  11-09-2025
96  Black Friday Sale  27-11-2024
97  Black Friday Sale  10-01-2025
98  Black Friday Sale  01-06-2025
99  Black Friday Sale  19-10-2025

[100 rows x 10 columns]
```

```
df_renamed=df.rename(columns={'Age':'Life Line'})
df_renamed
```

```
    Customer_ID             Name  Gender  Life Line
City  \
0             1    Robert Foster  Female         60
Ian
1             2      Ariel Curry  Female         59
Renee
2             3  Joseph Crawford   Other         38
Tashafort
3             4       Melody May   Other         41
Patriciaview
4             5      Terri Baker    Male         46
Michaelaside
..          ...              ...     ...        ...
...
95           96      Joshua Boyd    Male         54
Smithstad
96           97     Tony Spencer    Male         48  South
Tiffanychester
97           98    Heather Reyes   Other         51
Philipton
98           99       Todd Novak    Male         58
Wilsontown
99          100    Maria Cabrera    Male         58
Kayla

    Items_Purchased  Total_Spent(₹) Payment_Method Visited_Store  \
0                 8            8248      Gift Card     Lulu Mall
1                 5           39404           Cash     Lulu Mall
```

```
2                 9           48355    Credit Card     Lulu Mall
3                 2           39748    Credit Card     Lulu Mall
4                10           19551            UPI     Lulu Mall
..              ...             ...            ...           ...
95                5           10126    Credit Card     Lulu Mall
96                7           10084      Gift Card     Lulu Mall
97                6           27546      Gift Card     Lulu Mall
98                5           42109           Cash     Lulu Mall
99               10           46449     Debit Card     Lulu Mall

                  Event        Date
0   Black Friday Sale  02-11-2024
1   Black Friday Sale  12-02-2025
2   Black Friday Sale  02-06-2025
3   Black Friday Sale  27-09-2025
4   Black Friday Sale  04-10-2025
..                ...         ...
95  Black Friday Sale  11-09-2025
96  Black Friday Sale  27-11-2024
97  Black Friday Sale  10-01-2025
98  Black Friday Sale  01-06-2025
99  Black Friday Sale  19-10-2025

[100 rows x 11 columns]
```

```
df_sorted=df.sort_values(by='Age')
df_sorted
```

```
    Customer_ID              Name  Gender  Age               City  \
57           58      Tina Stevens  Female   18         North Lisa
56           57  Katherine Miller   Other   19    West Rachelbury
78           79      Cameron Berg   Other   19  East Benjaminberg
70           71   Jessica Delgado    Male   19       Youngchester
72           73   Shane Rodriguez   Other   21    East Emilymouth
..          ...               ...     ...  ...                ...
1             2       Ariel Curry  Female   59         Lake Renee
44           45         Jason May  Female   59        New Adamton
38           39  Mr. Walter Smith  Female   59   West Michaelside
12           13       Luke Rhodes    Male   60           Timshire
0             1     Robert Foster  Female   60           Port Ian

    Items_Purchased  Total_Spent(₹) Payment_Method Visited_Store  \
57                6           24616           Cash     Lulu Mall
56                6           26058      Gift Card     Lulu Mall
78                5           13050      Gift Card     Lulu Mall
70                6           35301            UPI     Lulu Mall
72                8           22174            UPI     Lulu Mall
..              ...             ...            ...           ...
1                 5           39404           Cash     Lulu Mall
44               14           18626    Credit Card     Lulu Mall
```

```
38                9           31843     Debit Card     Lulu Mall
12                7            9763            UPI     Lulu Mall
0                 8            8248      Gift Card     Lulu Mall

                Event        Date
57  Black Friday Sale  10-05-2025
56  Black Friday Sale  19-06-2025
78  Black Friday Sale  30-06-2025
70  Black Friday Sale  24-10-2025
72  Black Friday Sale  01-11-2024
..                ...         ...
1   Black Friday Sale  12-02-2025
44  Black Friday Sale  05-12-2024
38  Black Friday Sale  21-05-2025
12  Black Friday Sale  14-10-2025
0   Black Friday Sale  02-11-2024

[100 rows x 11 columns]

df_filled = df.fillna(0)
df_filled

    Customer_ID             Name  Gender  Age                  City  \
0             1    Robert Foster  Female   60             Port Ian
1             2      Ariel Curry  Female   59           Lake Renee
2             3  Joseph Crawford   Other   38       West Tashafort
3             4       Melody May   Other   41         Patriciaview
4             5      Terri Baker    Male   46         Michaelaside
..          ...              ...     ...  ...                  ...
95           96      Joshua Boyd    Male   54             Smithstad
96           97     Tony Spencer    Male   48  South Tiffanychester
97           98    Heather Reyes   Other   51             Philipton
98           99       Todd Novak    Male   58           Wilsontown
99          100    Maria Cabrera    Male   58          South Kayla

    Items_Purchased  Total_Spent(₹) Payment_Method Visited_Store  \
0                 8            8248      Gift Card     Lulu Mall
1                 5           39404           Cash     Lulu Mall
2                 9           48355    Credit Card     Lulu Mall
3                 2           39748    Credit Card     Lulu Mall
4                10           19551            UPI     Lulu Mall
..              ...             ...            ...          ...
95                5           10126    Credit Card     Lulu Mall
96                7           10084      Gift Card     Lulu Mall
97                6           27546      Gift Card     Lulu Mall
98                5           42109           Cash     Lulu Mall
99               10           46449     Debit Card     Lulu Mall

                Event        Date
0   Black Friday Sale  02-11-2024
```

```
1   Black Friday Sale  12-02-2025
2   Black Friday Sale  02-06-2025
3   Black Friday Sale  27-09-2025
4   Black Friday Sale  04-10-2025
..                ...         ...
95  Black Friday Sale  11-09-2025
96  Black Friday Sale  27-11-2024
97  Black Friday Sale  10-01-2025
98  Black Friday Sale  01-06-2025
99  Black Friday Sale  19-10-2025

[100 rows x 11 columns]
```

```
df_unique= df.drop_duplicates()
df_unique
```

```
    Customer_ID             Name  Gender  Age                  City  \
0             1    Robert Foster  Female   60             Port Ian
1             2      Ariel Curry  Female   59           Lake Renee
2             3  Joseph Crawford   Other   38       West Tashafort
3             4       Melody May   Other   41         Patriciaview
4             5      Terri Baker    Male   46         Michaelaside
..          ...              ...     ...  ...                  ...
95           96      Joshua Boyd    Male   54             Smithstad
96           97     Tony Spencer    Male   48  South Tiffanychester
97           98    Heather Reyes   Other   51             Philipton
98           99       Todd Novak    Male   58            Wilsontown
99          100    Maria Cabrera    Male   58           South Kayla

    Items_Purchased  Total_Spent(₹) Payment_Method Visited_Store  \
0                 8            8248      Gift Card     Lulu Mall
1                 5           39404           Cash     Lulu Mall
2                 9           48355    Credit Card     Lulu Mall
3                 2           39748    Credit Card     Lulu Mall
4                10           19551            UPI     Lulu Mall
..              ...             ...            ...          ...
95                5           10126    Credit Card     Lulu Mall
96                7           10084      Gift Card     Lulu Mall
97                6           27546      Gift Card     Lulu Mall
98                5           42109           Cash     Lulu Mall
99               10           46449     Debit Card     Lulu Mall

                Event        Date
0   Black Friday Sale  02-11-2024
1   Black Friday Sale  12-02-2025
2   Black Friday Sale  02-06-2025
3   Black Friday Sale  27-09-2025
4   Black Friday Sale  04-10-2025
..                ...         ...
95  Black Friday Sale  11-09-2025
```

```
96  Black Friday Sale  27-11-2024
97  Black Friday Sale  10-01-2025
98  Black Friday Sale  01-06-2025
99  Black Friday Sale  19-10-2025

[100 rows x 11 columns]
```

```
df_replace= df.replace({'Robert Foster':'suryansh'})
df_replace
```

```
    Customer_ID             Name  Gender  Age                  City  \
0             1         suryansh  Female   60             Port Ian
1             2      Ariel Curry  Female   59           Lake Renee
2             3  Joseph Crawford   Other   38       West Tashafort
3             4       Melody May   Other   41         Patriciaview
4             5      Terri Baker    Male   46         Michaelaside
..          ...              ...     ...  ...                  ...
95           96      Joshua Boyd    Male   54             Smithstad
96           97     Tony Spencer    Male   48  South Tiffanychester
97           98    Heather Reyes   Other   51             Philipton
98           99       Todd Novak    Male   58           Wilsontown
99          100    Maria Cabrera    Male   58          South Kayla

    Items_Purchased  Total_Spent(₹) Payment_Method Visited_Store  \
0                 8            8248      Gift Card     Lulu Mall
1                 5           39404           Cash     Lulu Mall
2                 9           48355    Credit Card     Lulu Mall
3                 2           39748    Credit Card     Lulu Mall
4                10           19551            UPI     Lulu Mall
..              ...             ...            ...           ...
95                5           10126    Credit Card     Lulu Mall
96                7           10084      Gift Card     Lulu Mall
97                6           27546      Gift Card     Lulu Mall
98                5           42109           Cash     Lulu Mall
99               10           46449     Debit Card     Lulu Mall

                Event        Date
0   Black Friday Sale  02-11-2024
1   Black Friday Sale  12-02-2025
2   Black Friday Sale  02-06-2025
3   Black Friday Sale  27-09-2025
4   Black Friday Sale  04-10-2025
..                ...         ...
95  Black Friday Sale  11-09-2025
96  Black Friday Sale  27-11-2024
97  Black Friday Sale  10-01-2025
98  Black Friday Sale  01-06-2025
99  Black Friday Sale  19-10-2025

[100 rows x 11 columns]
```

```
df['Total_Spent(₹)'].mean()
```

```
np.float64(24660.17)
```

```
df['Total_Spent(₹)'].max(), df['Total_Spent(₹)'].min()
```

```
(np.int64(49544), np.int64(1015))
```

```
df.groupby('Gender')['Total_Spent(₹)'].mean()
```

```
Gender
Female    25460.294118
Male      23680.184211
Other     25018.571429
Name: Total_Spent(₹), dtype: float64
```

```
df.groupby('City')
['Total_Spent(₹)'].sum().sort_values(ascending=False).head(1)
```

```
City
Smithport    49544
Name: Total_Spent(₹), dtype: int64
```

```
df[['Name', 'Total_Spent(₹)']].sort_values(by='Total_Spent(₹)',
ascending=False).head(5)
```

```
                  Name  Total_Spent(₹)
73         Mark Miller           49544
53   Samantha Griffin           49356
80         Kevin Wyatt           48926
45  Kimberly Phillips           48488
2     Joseph Crawford           48355
```

```
bins = [0, 20, 30, 40, 50, 60, 70]
labels = ['<20', '20-30', '30-40', '40-50', '50-60', '60+']
df['Age_Group'] = pd.cut(df['Age'], bins=bins, labels=labels)
df.groupby('Age_Group')
['Total_Spent(₹)'].mean().sort_values(ascending=False)
```

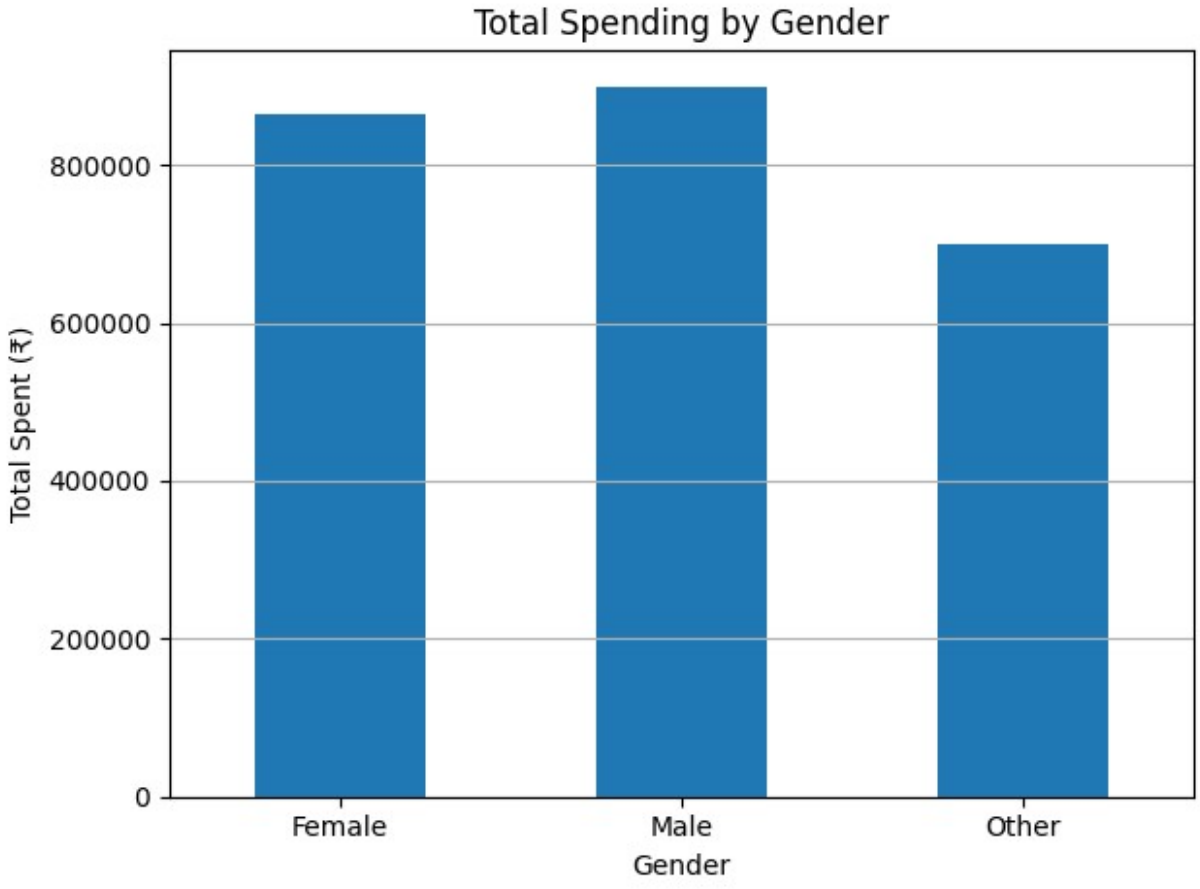
```
C:\Users\Shiva\AppData\Local\Temp\ipykernel_17860\2352863495.py:4:
FutureWarning: The default of observed=False is deprecated and will be
changed to True in a future version of pandas. Pass observed=False to
retain current behavior or observed=True to adopt the future default
and silence this warning.
  df.groupby('Age_Group')
['Total_Spent(₹)'].mean().sort_values(ascending=False)
```

```
Age_Group
30-40    27089.826087
<20      24756.250000
40-50    24563.678571
20-30    24231.200000
```

```
50-60    22860.760000
60+               NaN
Name: Total_Spent(₹), dtype: float64

pip install matplotlib

Requirement already satisfied: matplotlib in c:\users\shiva\appdata\
local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (3.10.7)
Requirement already satisfied: contourpy>=1.0.1 in c:\users\shiva\
appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from matplotlib) (1.3.3)
Requirement already satisfied: cycler>=0.10 in c:\users\shiva\appdata\
local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (from matplotlib)
(0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in c:\users\shiva\
appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from matplotlib) (4.60.1)
Requirement already satisfied: kiwisolver>=1.3.1 in c:\users\shiva\
appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from matplotlib) (1.4.9)
Requirement already satisfied: numpy>=1.23 in c:\users\shiva\appdata\
local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (from matplotlib)
(2.3.4)
Requirement already satisfied: packaging>=20.0 in c:\users\shiva\
appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from matplotlib) (25.0)
Requirement already satisfied: pillow>=8 in c:\users\shiva\appdata\
local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (from matplotlib)
(12.0.0)
Requirement already satisfied: pyparsing>=3 in c:\users\shiva\appdata\
local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (from matplotlib)
(3.2.5)
Requirement already satisfied: python-dateutil>=2.7 in c:\users\shiva\
appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from matplotlib) (2.9.0.post0)
Requirement already satisfied: six>=1.5 in c:\users\shiva\appdata\
local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (from python-
dateutil>=2.7->matplotlib) (1.17.0)
Note: you may need to restart the kernel to use updated packages.
```

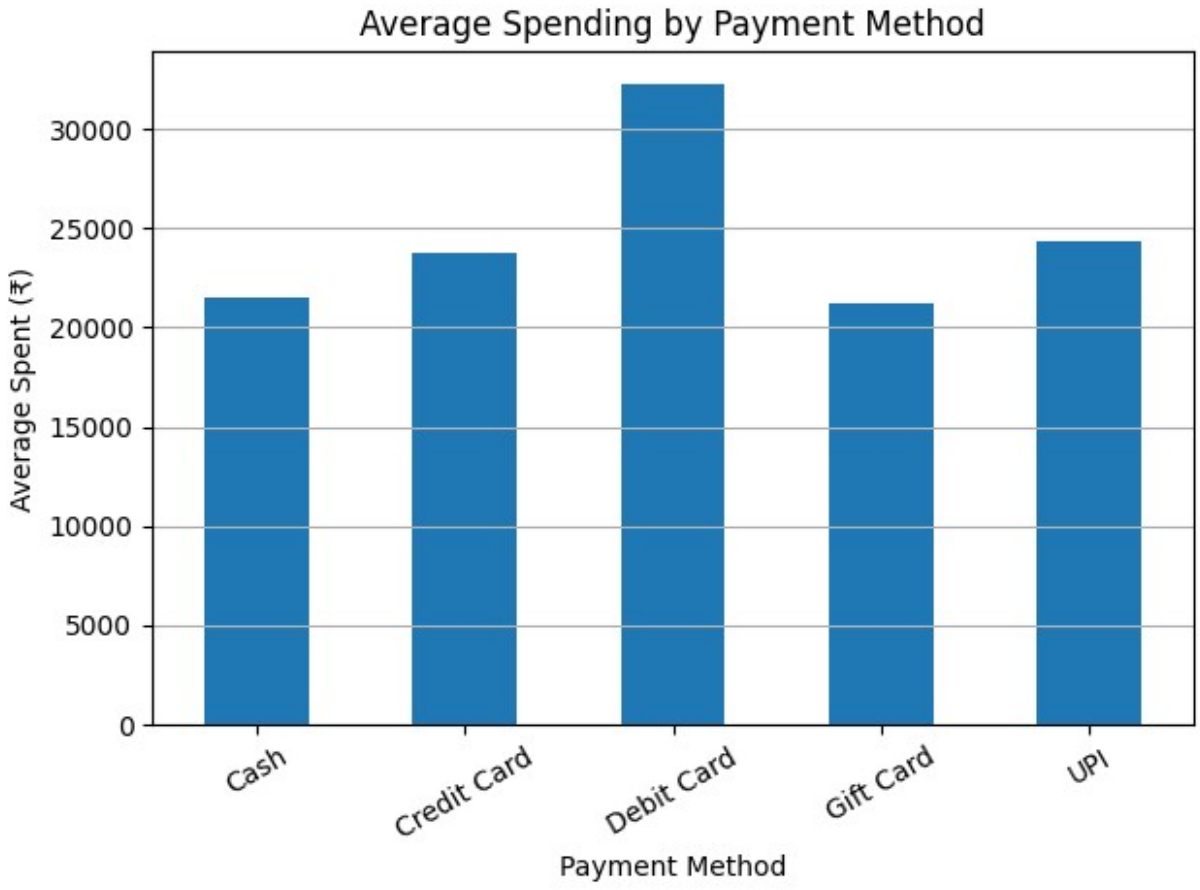
```
[notice] A new release of pip is available: 24.0 -> 25.3
[notice] To update, run: C:\Users\Shiva\AppData\Local\Microsoft\
WindowsApps\PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\
python.exe -m pip install --upgrade pip
```

```
import matplotlib.pyplot as plt
gender_sales = df.groupby("Gender")["Total_Spent(₹)"].sum()
plt.figure()
gender_sales.plot(kind="bar")
plt.title("Total Spending by Gender")
plt.xlabel("Gender")
plt.ylabel("Total Spent (₹)")
plt.xticks(rotation=0)
plt.grid(axis="y")
plt.tight_layout()
```

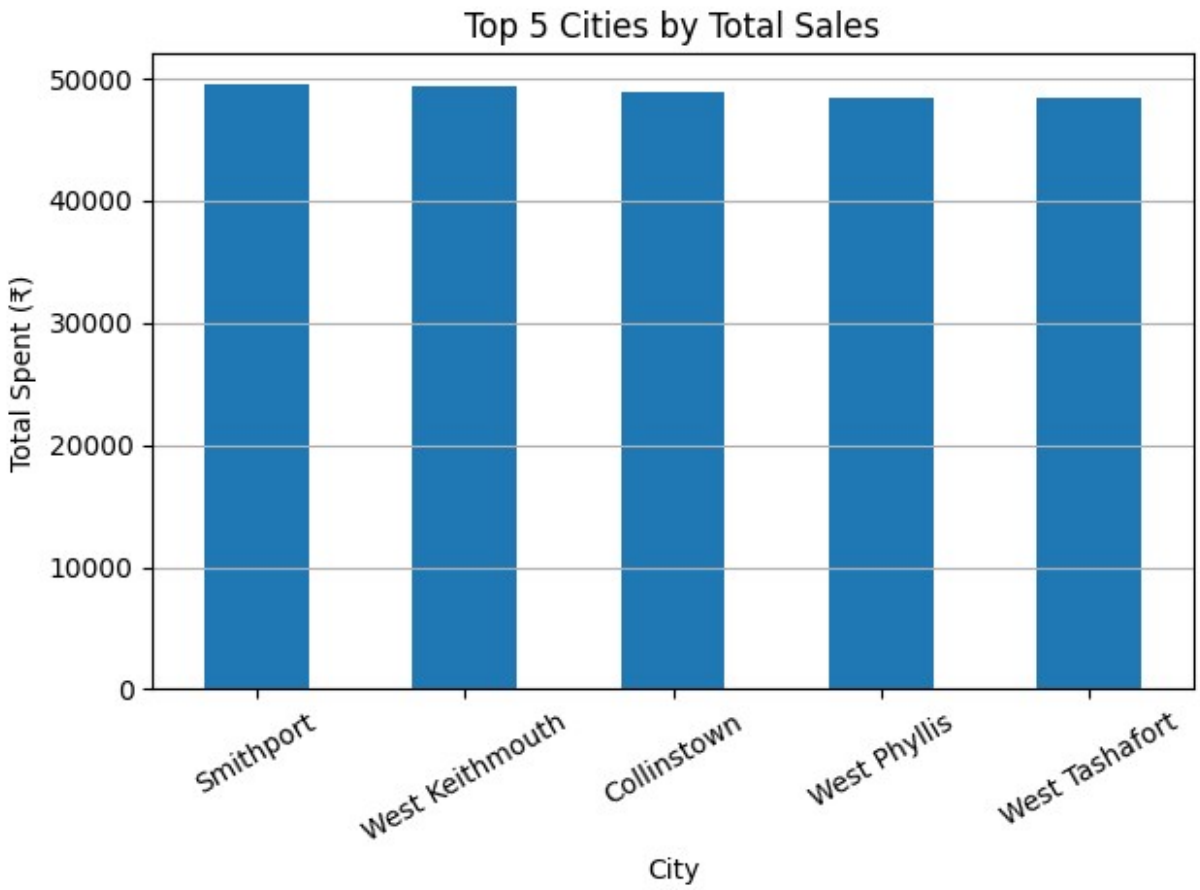



```
payment_avg = df.groupby("Payment_Method")["Total_Spent(₹)"].mean()
plt.figure()
payment_avg.plot(kind="bar")
plt.title("Average Spending by Payment Method")
plt.xlabel("Payment Method")
```

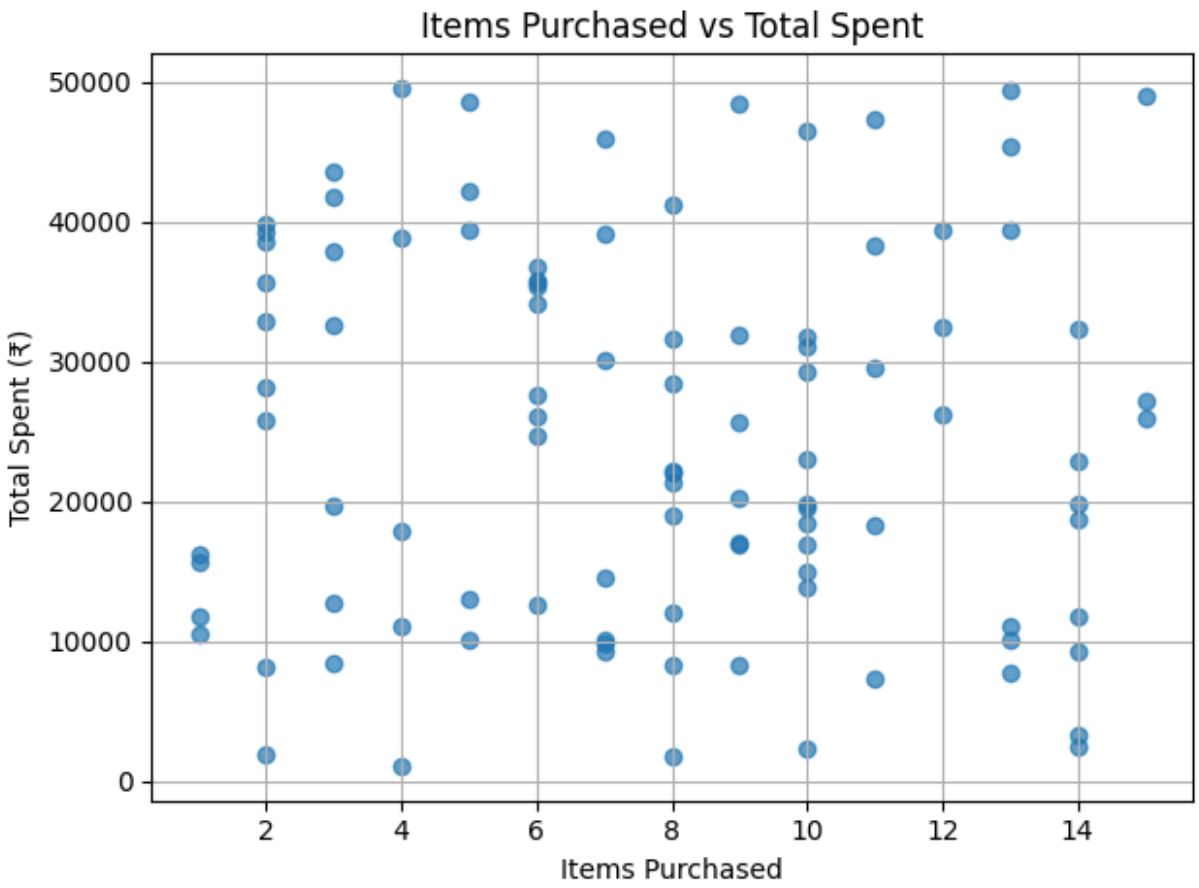
```
plt.ylabel("Average Spent (₹)")
plt.xticks(rotation=30)
plt.grid(axis="y")
plt.tight_layout()
```



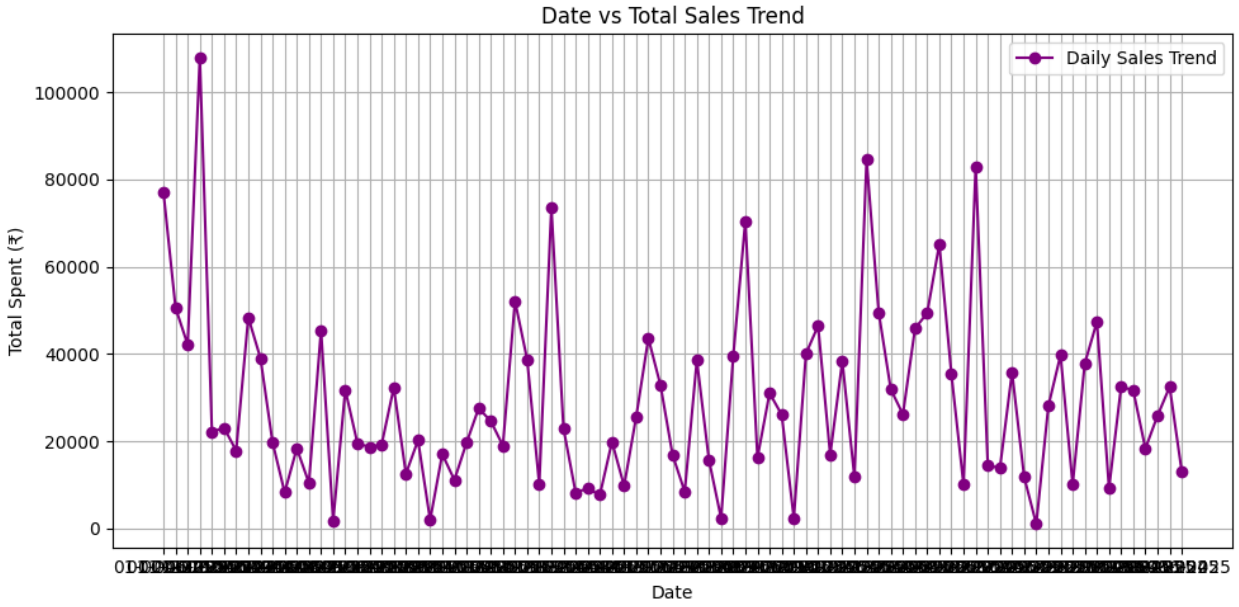

```
city_sales = df.groupby("City")["Total_Spent(₹)"].sum().nlargest(5)
plt.figure()
city_sales.plot(kind="bar")
plt.title("Top 5 Cities by Total Sales")
plt.xlabel("City")
plt.ylabel("Total Spent (₹)")
plt.xticks(rotation=30)
plt.grid(axis="y")
plt.tight_layout()
```



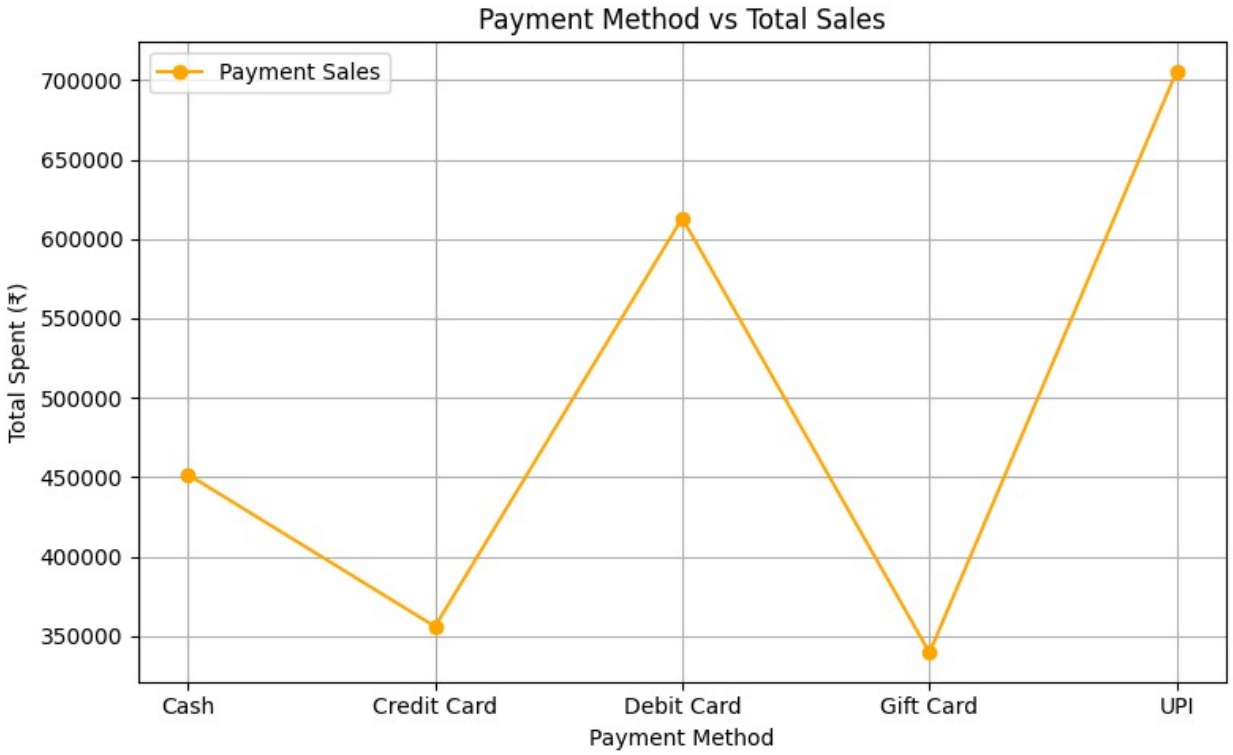

```
plt.figure()
plt.scatter(df["Items_Purchased"], df["Total_Spent(₹)"], alpha=0.7)
plt.title("Items Purchased vs Total Spent")
plt.xlabel("Items Purchased")
plt.ylabel("Total Spent (₹)")
plt.grid(True)
plt.tight_layout()

plt.show()
```




```
date_sales = df.groupby("Date")["Total_Spent(₹)"].sum().sort_index()
plt.figure(figsize=(10, 5))
plt.plot(date_sales.index, date_sales.values, marker="o",
linestyle="-", color="purple", label="Daily Sales Trend")
plt.title("Date vs Total Sales Trend")
plt.xlabel("Date")
plt.ylabel("Total Spent (₹)")
plt.legend()
plt.grid(True)
plt.tight_layout()
plt.show()
```




```
payment_sales = df.groupby("Payment_Method")["Total_Spent(₹)"].sum()
plt.figure(figsize=(8, 5))
plt.plot(payment_sales.index, payment_sales.values, marker="o",
linestyle="-", color="orange", label="Payment Sales")
plt.title("Payment Method vs Total Sales")
plt.xlabel("Payment Method")
plt.ylabel("Total Spent (₹)")
plt.legend()
plt.grid(True)
plt.tight_layout()
plt.show()
```


Payment Method vs Total Sales
Payment Sales
700000
650000
600000
550000
500000
450000
400000
350000
Total Spent (₹)
Cash
Credit Card
Debit Card
Gift Card
UPI
Payment Method