

E_Commerce_Sales_Analysis_Python

February 10, 2026

```
[1]: !pip install pandas openpyxl
```

```
Defaulting to user installation because normal site-packages is not writeable
Requirement already satisfied: pandas in
c:\users\annap\appdata\roaming\python\python313\site-packages (2.3.2)
Collecting openpyxl
  Downloading openpyxl-3.1.5-py2.py3-none-any.whl.metadata (2.5 kB)
Requirement already satisfied: numpy>=1.26.0 in
c:\users\annap\appdata\roaming\python\python313\site-packages (from pandas)
(2.3.3)
Requirement already satisfied: python-dateutil>=2.8.2 in
c:\users\annap\appdata\roaming\python\python313\site-packages (from pandas)
(2.9.0.post0)
Requirement already satisfied: pytz>=2020.1 in
c:\users\annap\appdata\roaming\python\python313\site-packages (from pandas)
(2025.2)
Requirement already satisfied: tzdata>=2022.7 in
c:\users\annap\appdata\roaming\python\python313\site-packages (from pandas)
(2025.2)
Collecting et-xmlfile (from openpyxl)
  Downloading et_xmlfile-2.0.0-py3-none-any.whl.metadata (2.7 kB)
Requirement already satisfied: six>=1.5 in
c:\users\annap\appdata\roaming\python\python313\site-packages (from python-
dateutil>=2.8.2->pandas) (1.17.0)
Downloading openpyxl-3.1.5-py2.py3-none-any.whl (250 kB)
Downloading et_xmlfile-2.0.0-py3-none-any.whl (18 kB)
Installing collected packages: et-xmlfile, openpyxl
```

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```

Successfully installed et-xmlfile-2.0.0 openpyxl-3.1.5

[notice] A new release of pip is available: 25.2 -> 26.0

[notice] To update, run: C:\Program Files\Python313\python.exe -m pip install --upgrade pip

```
[2]: import pandas as pd
```

```
[4]: df = pd.read_csv(r"C:\Users\annap\OneDrive\Desktop\Excel\E-commerce Dataset.
      ↪csv")
```

```
[5]: import pandas as pd
```

```
df = pd.read_csv(r"C:\Users\annap\OneDrive\Desktop\Excel\E-commerce Dataset.
      ↪csv")
```

```
df.head()
```

```
[5]:
```

| | User_ID | Product_ID | Category | Price (Rs.) | Discount (%) | \ |
|---|----------|------------|----------|-------------|--------------|---|
| 0 | 337c166f | f414122f-e | Sports | 36.53 | 15 | |
| 1 | d38a19bf | fde50f9c-5 | Clothing | 232.79 | 20 | |
| 2 | d7f5f0b0 | 0d96fc90-3 | Sports | 317.02 | 25 | |
| 3 | 395d4994 | 964fc44b-d | Toys | 173.19 | 25 | |
| 4 | a83c145c | d70e2fc6-e | Beauty | 244.80 | 20 | |

| | Final_Price(Rs.) | Payment_Method | Purchase_Date |
|---|------------------|----------------|---------------|
| 0 | 31.05 | Net Banking | 12-11-2024 |
| 1 | 186.23 | Net Banking | 09-02-2024 |

| | | | |
|---|--------|-------------|------------|
| 2 | 237.76 | Credit Card | 01-09-2024 |
| 3 | 129.89 | UPI | 01-04-2024 |
| 4 | 195.84 | Net Banking | 27-09-2024 |

```
[6]: df.info()
df.columns
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 3660 entries, 0 to 3659
Data columns (total 8 columns):
#   Column                Non-Null Count  Dtype
---  -
0   User_ID               3660 non-null   object
1   Product_ID            3660 non-null   object
2   Category               3660 non-null   object
3   Price (Rs.)           3660 non-null   float64
4   Discount (%)          3660 non-null   int64
5   Final_Price(Rs.)      3660 non-null   float64
6   Payment_Method        3660 non-null   object
7   Purchase_Date         3660 non-null   object
dtypes: float64(2), int64(1), object(5)
memory usage: 228.9+ KB
```

```
[6]: Index(['User_ID', 'Product_ID', 'Category', 'Price (Rs.)', 'Discount (%)',
          'Final_Price(Rs.)', 'Payment_Method', 'Purchase_Date'],
        dtype='object')
```

```
[7]: import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

```
[9]: #What is the total revenue generated?
df["Final_Price(Rs.)"].sum()
```

```
[9]: np.float64(757278.08)
```

```
[10]: #Which category generates the highest revenue?
df.groupby("Category")["Final_Price(Rs.)"].sum().sort_values(ascending=False)
```

```
[10]: Category
Clothing      115314.84
Books         111149.35
Home & Kitchen 110328.08
Sports        108518.79
Toys          107289.69
Beauty        104215.10
Electronics   100462.23
```

Name: Final_Price(Rs.), dtype: float64

```
[11]: #What is the average discount percentage?  
df["Discount (%)"].mean()
```

[11]: np.float64(18.825136612021858)

```
[12]: #Which payment method is used most frequently?  
df["Payment_Method"].value_counts()
```

```
[12]: Payment_Method  
Credit Card      760  
UPI               757  
Debit Card       731  
Net Banking      716  
Cash on Delivery 696  
Name: count, dtype: int64
```

```
[14]: #Which category offers the highest average discount?  
df.groupby("Category")["Discount (%)"].mean().sort_values(ascending=False)
```

```
[14]: Category  
Home & Kitchen    19.608379  
Sports            19.326923  
Electronics      19.267068  
Books             19.035581  
Beauty           18.475248  
Toys              18.126195  
Clothing          17.919021  
Name: Discount (%), dtype: float64
```

```
[15]: #What is the Average Order Value (AOV)?  
df["Final_Price(Rs.)"].mean()
```

[15]: np.float64(206.90657923497267)

```
[16]: #How much revenue is lost due to discounts?  
(df["Price (Rs.)"] - df["Final_Price(Rs.)"]).sum()
```

[16]: np.float64(175292.39)

```
[17]: #Who are the top 10 high-value customers?  
df.groupby("User_ID")["Final_Price(Rs.)"].sum().sort_values(ascending=False).  
    ↪head(10)
```

```
[17]: User_ID  
8b885340    496.82  
20797b76    495.02
```

```

d8970dd2    493.04
da7bc76a    492.41
68722b9b    491.70
05e6557c    487.06
67abda0a    486.79
d646700c    484.56
edb89577    480.49
f9e89622    479.63
Name: Final_Price(Rs.), dtype: float64

```

```
[20]: df["Purchase_Date"] = pd.to_datetime(df["Purchase_Date"], errors="coerce")
```

```
[21]: df["Purchase_Date"].dtype
```

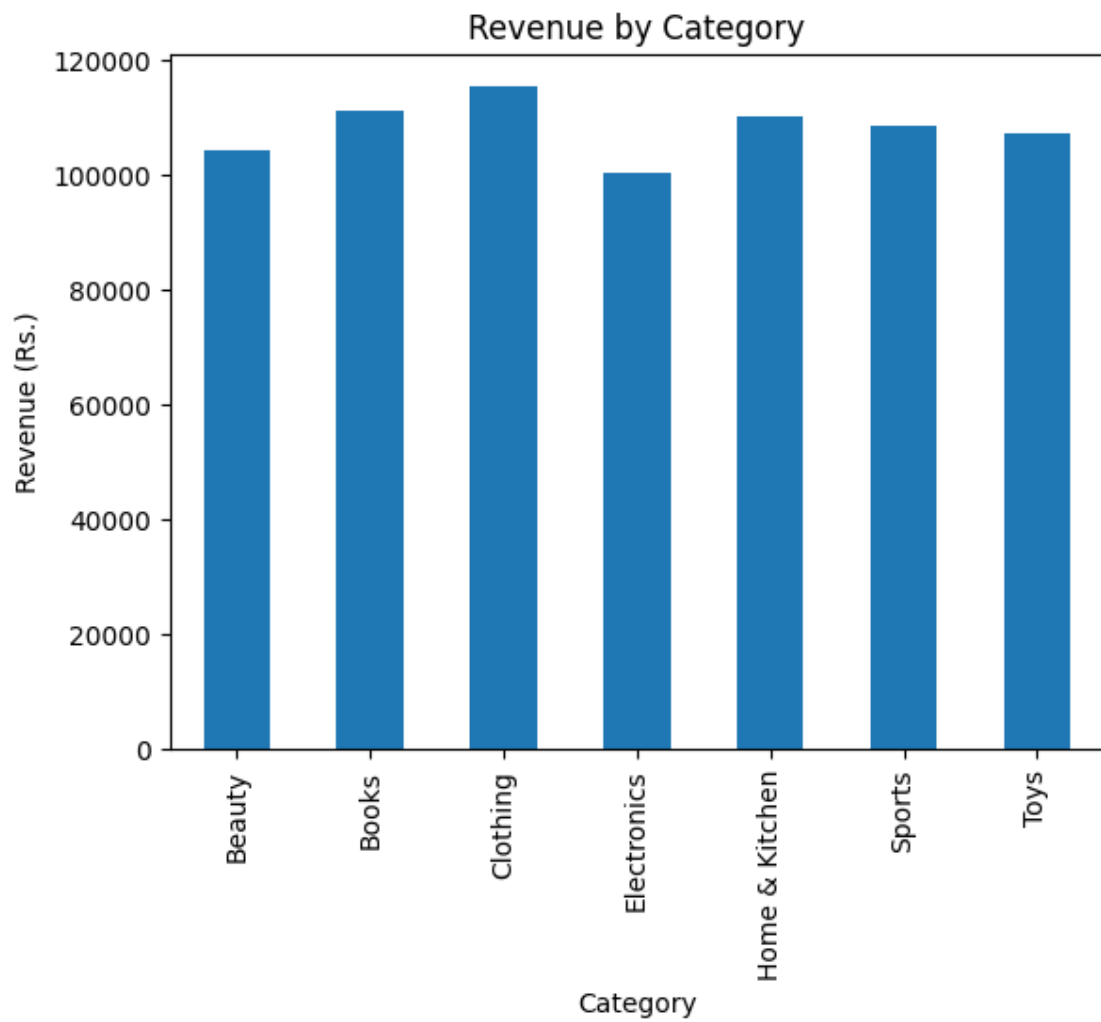
```
[21]: dtype('<M8[ns]')
```

```
[24]: #Which day of the week has the highest sales?
weekday_sales = (
    df.groupby(df["Purchase_Date"].dt.day_name())["Final_Price(Rs.)"]
      .sum()
      .sort_values(ascending=False)
)

weekday_sales
```

```
[24]: Purchase_Date
Saturday    51273.82
Thursday    47670.47
Monday      43337.35
Wednesday   43108.44
Sunday      41588.57
Friday      38726.10
Tuesday     36754.25
Name: Final_Price(Rs.), dtype: float64
```

```
[25]: #Category-wise Revenue Chart
df.groupby("Category")["Final_Price(Rs.)"].sum().plot(kind="bar")
plt.title("Revenue by Category")
plt.ylabel("Revenue (Rs.)")
plt.show()
```



[]: