In [17]:
```
import pandas as pd
import numpy as np
```

In [2]:
```
df = pd.read_csv('grocery_sales.csv')
```

In [3]:
```
df
```

Out[3]:

	Date	Item	Category	Quantity	Unit_Price	Total_Sale	Payment_Method
0	2025-07-01	Bread	Bakery	12	30	360	Cash
1	2025-07-02	Cookies	Bakery	5	20	100	UPI
2	2025-07-03	Orange	Fruits	19	25	475	Cash
3	2025-07-04	Orange	Fruits	9	25	225	Cash
4	2025-07-05	Banana	Fruits	18	10	180	UPI
...	...	...	...	...	...	...	...
95	2025-10-04	Orange	Fruits	1	25	25	UPI
96	2025-10-05	Cake	Bakery	19	150	2850	UPI
97	2025-10-06	Grapes	Fruits	18	18	324	UPI
98	2025-10-07	Milk	Dairy	1	45	45	Card
99	2025-10-08	Milk	Dairy	14	45	630	UPI

100 rows × 7 columns

In [5]:
```
df.shape # Checking the number of rows and columns
```

Out[5]:
```
(100, 7)
```

In [11]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 100 entries, 0 to 99
Data columns (total 7 columns):
 #   Column          Non-Null Count  Dtype 
---  ------          --------------  ----- 
 0   Date            100 non-null    object
 1   Item            100 non-null    object
 2   Category        100 non-null    object
 3   Quantity        100 non-null    int64 
 4   Unit_Price      100 non-null    int64 
 5   Total_Sale      100 non-null    int64 
 6   Payment_Method  100 non-null    object
dtypes: int64(3), object(4)
memory usage: 5.6+ KB
```

Checking missing values in columns

In [10]:
```
df.isnull().sum()
```

Out[10]:
```
Date              0
Item              0
Category          0
Quantity          0
Unit_Price        0
Total_Sale        0
Payment_Method    0
dtype: int64
```

In [12]:
```
df.describe()
```

Out[12]:

	Quantity	Unit_Price	Total_Sale
count	100.000000	100.000000	100.000000
mean	10.380000	43.660000	427.720000
std	5.674291	37.054756	486.395484
min	1.000000	6.000000	10.000000
25%	6.000000	20.000000	157.500000
50%	10.000000	25.000000	300.000000
75%	15.000000	60.000000	480.000000
max	20.000000	150.000000	2850.000000

Total Sales per day

In [16]:
```
total_sales_per_day = df[['Date','Total_Sale']]
total_sales_per_day
```

Out[16]:

	Date	Total_Sale
0	2025-07-01	360
1	2025-07-02	100
2	2025-07-03	475
3	2025-07-04	225
4	2025-07-05	180
...	...	...
95	2025-10-04	25
96	2025-10-05	2850
97	2025-10-06	324
98	2025-10-07	45
99	2025-10-08	630

100 rows × 2 columns

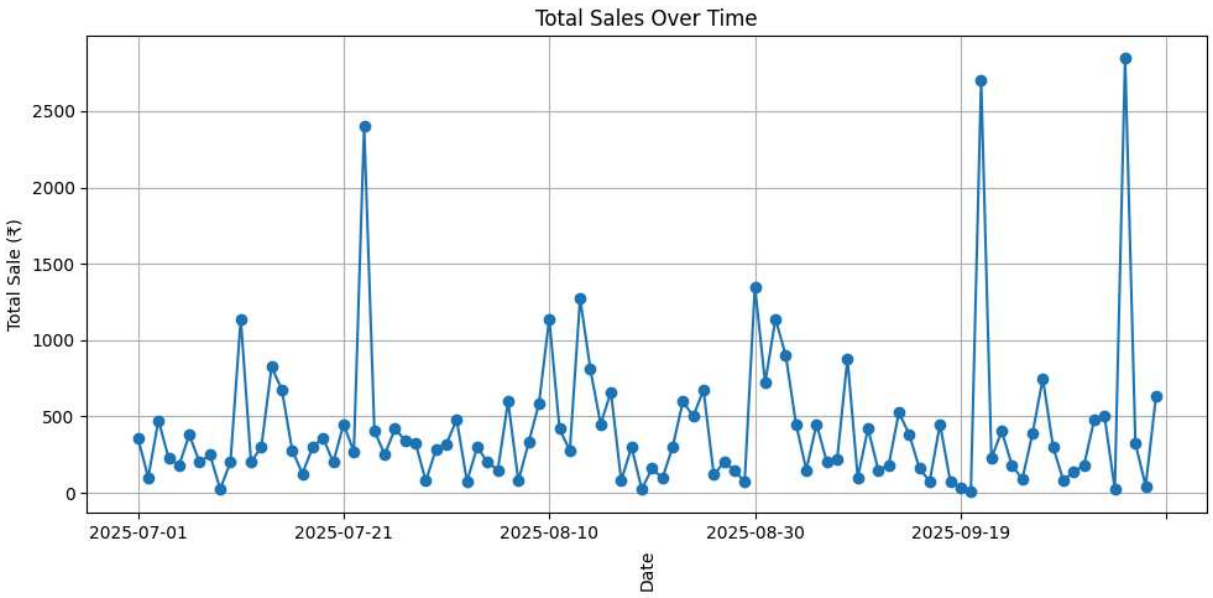
In [20]:
```
highest_day_sale = np.max(total_sales_per_day['Total_Sale'])
highest_day_sale
```

Out[20]: 2850

Line graph of total sale over time

In [24]:
```
import matplotlib.pyplot as plt
```

In [49]:
```
plt.figure(figsize=(10, 5))
daily_sales.plot(marker='o')
plt.title("Total Sales Over Time")
plt.xlabel("Date",rotation='vertical')
plt.ylabel("Total Sale (₹)")
plt.grid(True)
plt.tight_layout()
plt.show()
```



In [27]:
```
df.head()
```

Out[27]:

	Date	Item	Category	Quantity	Unit_Price	Total_Sale	Payment_Method
0	2025-07-01	Bread	Bakery	12	30	360	Cash
1	2025-07-02	Cookies	Bakery	5	20	100	UPI
2	2025-07-03	Orange	Fruits	19	25	475	Cash
3	2025-07-04	Orange	Fruits	9	25	225	Cash
4	2025-07-05	Banana	Fruits	18	10	180	UPI

Total quantity sold by category

In [32]:
```
# total_quantity_sold_by_category = df[['Category','Quantity']]
# total_quantity_sold_by_category

print(df.groupby("Category")["Quantity"].sum())
```

```
Category
Bakery    232
Dairy     415
Fruits    391
Name: Quantity, dtype: int64
```

Total sale by category

In [33]:
```
print(df.groupby("Category")['Total_Sale'].sum())
```

```
Category
Bakery    15630
Dairy     19942
Fruits     7200
Name: Total_Sale, dtype: int64
```

Top 5 best-selling items (by quantity)

In [34]:
```
print(df.groupby("Item")["Quantity"].sum().sort_values(ascending=False).head())
```

```
Item
Orange    112
Bread     111
Banana    102
Milk      100
Cheese     99
Name: Quantity, dtype: int64
```

Top 5 revenue-generating items

In [35]:
```
print(df.groupby("Item")["Total_Sale"].sum().sort_values(ascending=False).head())
```

```
Item
Cake      11400
Cheese     5940
Paneer     4875
Milk       4500
Bread      3330
Name: Total_Sale, dtype: int64
```

Average unit price by category

In [38]:
```
print(df.groupby("Category")['Unit_Price'].mean())
```

```
Category
Bakery    70.909091
Dairy     49.045455
Fruits    19.058824
Name: Unit_Price, dtype: float64
```

Item with highest unit price

In [ ]:
```

```

Revenue per unit by category

In [40]:
```
df.groupby("Category")["Total_Sale"].sum()
```

Out[40]:
```
Category
Bakery    15630
Dairy     19942
Fruits     7200
Name: Total_Sale, dtype: int64
```

In [41]:
```
df.groupby("Category")["Quantity"].sum()
```

Out[41]:
```
Category
Bakery    232
Dairy     415
Fruits    391
Name: Quantity, dtype: int64
```

In [39]:
```
revenue_per_unit = df.groupby("Category")["Total_Sale"].sum() / df.groupby("Categor
print(revenue_per_unit)
```

```
Category
Bakery    67.370690
Dairy     48.053012
Fruits    18.414322
dtype: float64
```

Category wise sales per day

In [43]:
```
df.groupby('Date')['Category'].sum()
```

Out[43]:
```
Date
2025-07-01    Bakery
2025-07-02    Bakery
2025-07-03    Fruits
2025-07-04    Fruits
2025-07-05    Fruits
               ...
2025-10-04    Fruits
2025-10-05    Bakery
2025-10-06    Fruits
2025-10-07     Dairy
2025-10-08     Dairy
Name: Category, Length: 100, dtype: object
```

Total sales by each payment method

In [45]:
```
df.groupby('Payment_Method')['Total_Sale'].sum()
```

Out[45]:
```
Payment_Method
Card    14824
Cash    13849
UPI     14099
Name: Total_Sale, dtype: int64
```

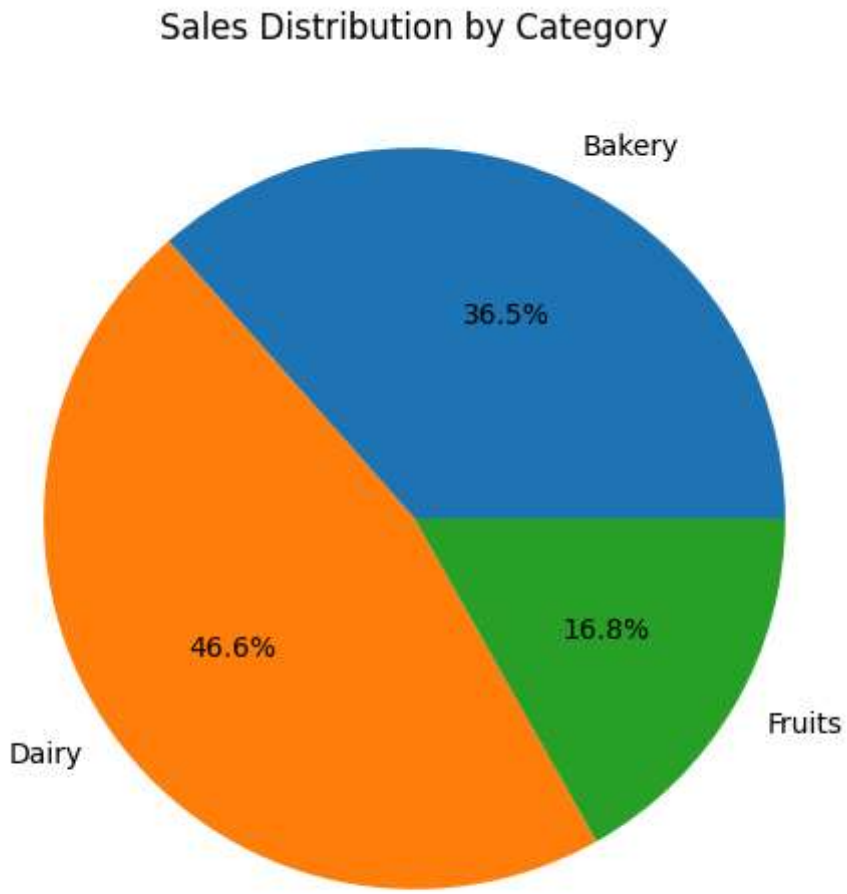
Popular payment method

In [56]:
```
print("\nMost used payment method:", df["Payment_Method"].value_counts().idxmax())
```

```
Most used payment method: Card
```

Sales distribution by category.

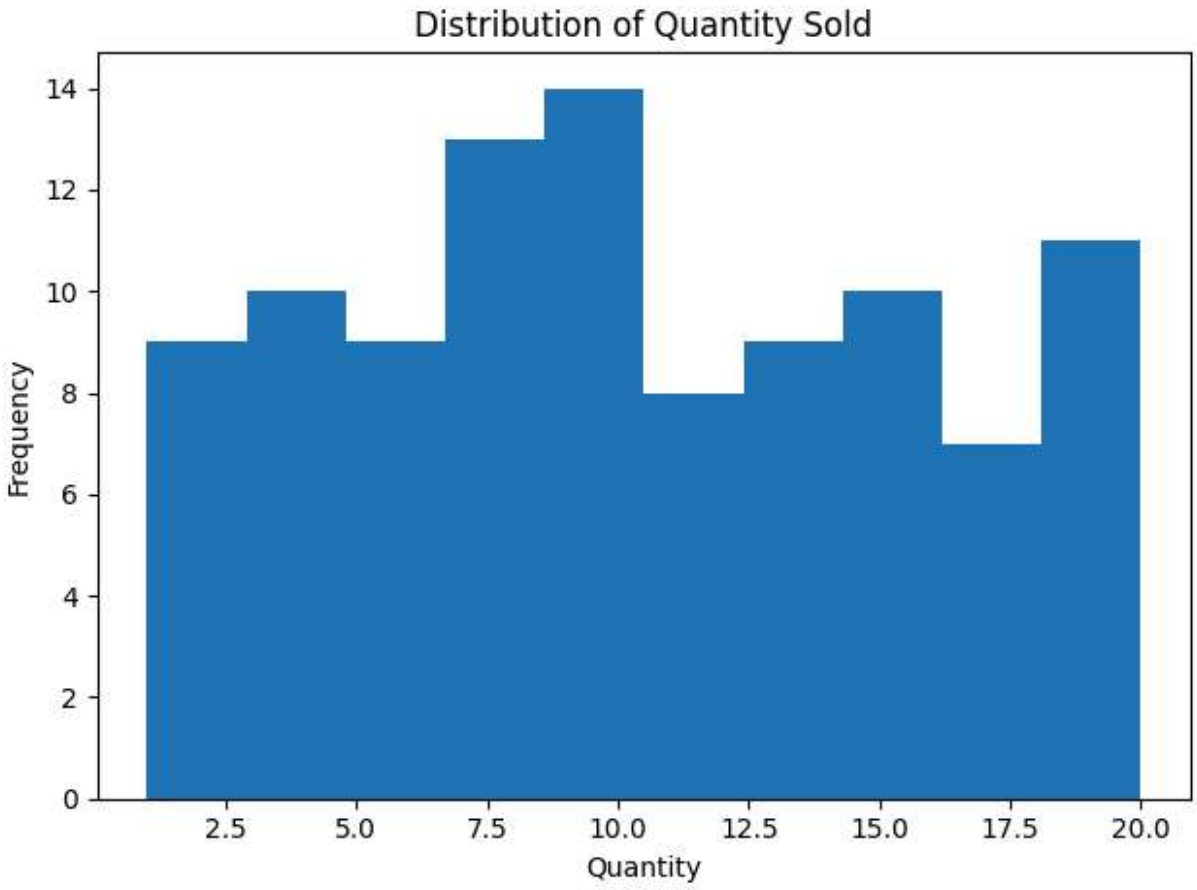
In [58]:
```
# Pie chart: Sales by category
df.groupby("Category")["Total_Sale"].sum().plot(kind="pie", autopct="%1.1f%%", figs
plt.title("Sales Distribution by Category")
plt.ylabel("")
plt.show()
```



Distribution of quantity sold

In [62]:
```
df["Quantity"].plot(kind="hist", bins=10, title="Distribution of Quantity Sold")
plt.xlabel("Quantity")
```

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



Adding new column as Revenue_per_unit

In [63]:
```
df['Revenue_per_unit'] = df.Total_Sale / df.Quantity
```

In [66]:
```
df
```

Out[66]:

	Date	Item	Category	Quantity	Unit_Price	Total_Sale	Payment_Method	Revenue_
0	2025-07-01	Bread	Bakery	12	30	360	Cash	
1	2025-07-02	Cookies	Bakery	5	20	100	UPI	
2	2025-07-03	Orange	Fruits	19	25	475	Cash	
3	2025-07-04	Orange	Fruits	9	25	225	Cash	
4	2025-07-05	Banana	Fruits	18	10	180	UPI	
...	...	...	...	...	...	...	...	...
95	2025-10-04	Orange	Fruits	1	25	25	UPI	
96	2025-10-05	Cake	Bakery	19	150	2850	UPI	
97	2025-10-06	Grapes	Fruits	18	18	324	UPI	
98	2025-10-07	Milk	Dairy	1	45	45	Card	
99	2025-10-08	Milk	Dairy	14	45	630	UPI	

100 rows × 8 columns

Identify items with Revenue_per_unit > 50

In [67]:
```
print(df[df["Revenue_per_unit"] > 50][["Date", "Item", "Revenue_per_unit"]].head())
```

```
         Date    Item  Revenue_per_unit
10 2025-07-11  Cheese              60.0
13 2025-07-14  Butter              55.0
20 2025-07-21  Paneer              75.0
22 2025-07-23    Cake             150.0
31 2025-08-01  Cheese              60.0
```

In [ ]: