Task 7: Sales Summary Using SQLite and Python

Objective

The goal of this task is to extract basic sales information using SQL within Python. Specifically, we aim to calculate the total quantity sold and total revenue for each product in a simple SQLite database, then display this data using a print statement and a basic bar chart.

Tools Used

- Python (main programming language)
- sqlite3 (built-in SQLite support in Python)
- pandas (for SQL result handling)
- matplotlib (for chart generation)

Dataset Structure and Sample Records

We created a small SQLite database named 'sales_data.db' containing one table called 'sales'.

Columns:

- order_id
- product
- quantity
- price

Sample records:

order_id	product	quantity	price
1	Apples	10	1.5
2	Bananas	5	0.8
3	Cherries	8	2
4	Dates	6	3
5	Apples	7	1.5
6	Bananas	9	0.8
7	Cherries	5	2
8	Dates	4	3

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SQL Code Used to Create and Populate the Database

```
CREATE TABLE sales (
    order_id INTEGER,
    product TEXT,
    quantity INTEGER,
    price REAL
);

INSERT INTO sales VALUES
(1, 'Apples', 10, 1.50),
(2, 'Bananas', 5, 0.80),
(3, 'Cherries', 8, 2.00),
(4, 'Dates', 6, 3.00),
(5, 'Apples', 7, 1.50),
(6, 'Bananas', 9, 0.80),
(7, 'Cherries', 5, 2.00),
(8, 'Dates', 4, 3.00);
```

Python Code for Analysis and Visualization

```
import sqlite3
import pandas as pd
import matplotlib.pyplot as plt

# Connect to the database
conn = sqlite3.connect("sales_data.db")

# SQL query to get sales summary
query = """
SELECT
    product,
    SUM(quantity) AS total_qty,
    SUM(quantity * price) AS revenue
FROM sales
GROUP BY product;
"""

# Load data into DataFrame
df = pd.read_sql_query(query, conn)
print(df)
```

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```
# Plot a bar chart for revenue
df.plot(kind='bar', x='product', y='revenue', title='Revenue by Product')
plt.ylabel('Revenue')
plt.tight_layout()
plt.savefig("sales_chart.png")
plt.show()

conn.close()
```

Query Explanation

- The SQL query groups the data by product.
- It calculates total quantity sold using SUM(quantity).
- Revenue is computed by multiplying quantity and price.
- Results are loaded into pandas and visualized using matplotlib.

Printed Output

```
          total_qty  revenue
product
Apples           17     25.5
Bananas          14     11.2
Cherries         13     26.0
Dates            10     30.0
```

Revenue Bar Chart

The chart below displays the total revenue by product.

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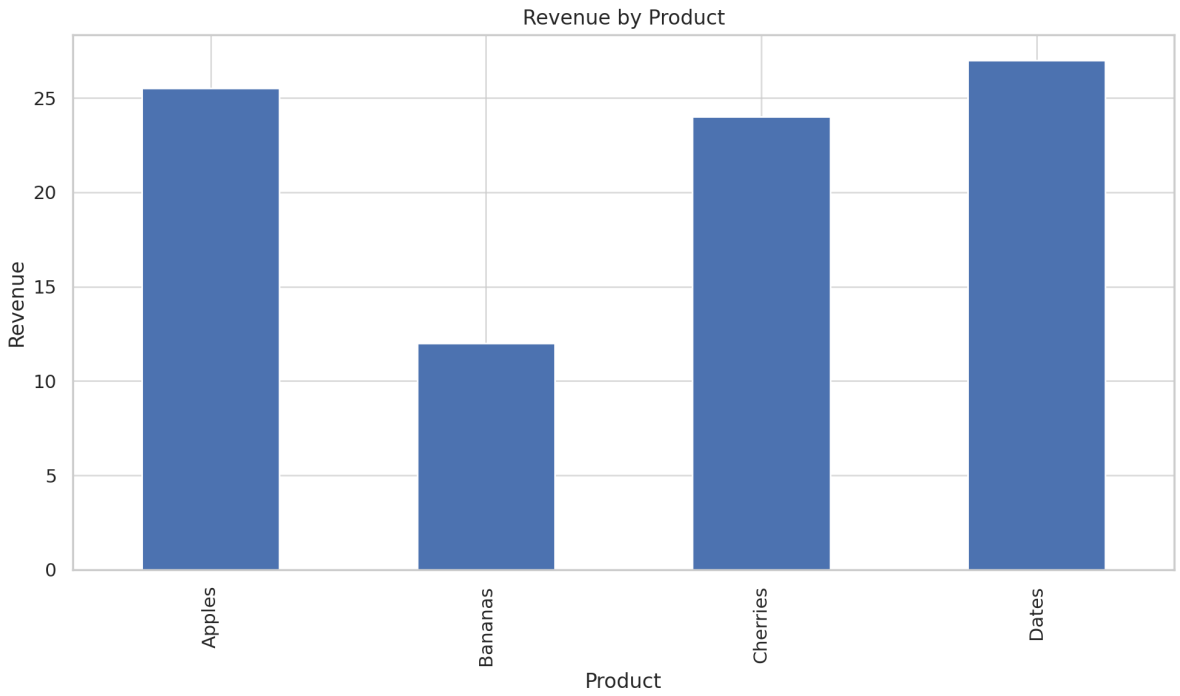

Conclusion

This exercise successfully demonstrates how to use SQLite with Python to summarize sales data. With just a few lines of SQL and Python code, we were able to pull key metrics and visualize them effectively. This approach is lightweight and efficient for quick, local data analysis tasks.