

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

def create_sample_database():
    """Create a sample SQLite database if it doesn't exist"""
    conn = sqlite3.connect('sales_data.db')
    cursor = conn.cursor()

    conn = sqlite3.connect('sales_data.db')
    cursor = conn.cursor()
    # Create sales table if it doesn't exist
    cursor.execute('''
        CREATE TABLE IF NOT EXISTS sales (
            id INTEGER PRIMARY KEY,
            product TEXT NOT NULL,
            quantity INTEGER NOT NULL,
            price REAL NOT NULL,
            sale_date TEXT
        )
    ''')
    cursor.execute("select * from sales")
    conn.commit()
    conn.close()
```

```
conn = sqlite3.connect('sales_data.db')
cursor = conn.cursor()
# Insert sample data if table is empty
cursor.execute("SELECT COUNT(*) FROM sales")
if cursor.fetchone()[0] == 0:
    sample_data = [
        ('Laptop', 5, 999.99, '2023-01-15'),
        ('Phone', 12, 699.99, '2023-01-16'),
        ('Tablet', 8, 349.99, '2023-01-17'),
        ('Laptop', 3, 899.99, '2023-01-18'),
        ('Phone', 7, 649.99, '2023-01-19'),
        ('Headphones', 15, 99.99, '2023-01-20'),
        ('Tablet', 4, 299.99, '2023-01-21')
    ]
    cursor.executemany("INSERT INTO sales (product, quantity, price, sale_date) VALUES (?, ?, ?, ?)", sample_data)
conn.commit()
```

```
def main():
    # Create sample database if it doesn't exist
    create_sample_database()
```

```
8]: #Total quantity and revenue by product
query1 = """
SELECT
    product,
    SUM(quantity) AS total_quantity,
    SUM(quantity * price) AS
total_revenue
FROM sales
GROUP BY product
ORDER BY total_revenue DESC
"""
```

```
0]: # Query 2: Overall summary stats
query2 = """
SELECT
    SUM(quantity) AS overall_quantity,
    SUM(quantity * price) AS overall_revenue,
    COUNT(DISTINCT product) AS unique_products
FROM sales
"""
```

```
1]: # Execute queries and Load into pandas DataFrames
df_products = pd.read_sql_query(query1, conn)
df_summary = pd.read_sql_query(query2, conn)
```

```
2]: # Close the database connection
conn.close()
```

```
B]: # Display results
print("== Sales Summary by Product ==")
print(df_products)
print("\n== Overall Sales Summary ==")
print(f"Total Items Sold: {df_summary['overall_quantity'][0]}")
print(f"Total Revenue: ${df_summary['overall_revenue'][0]:,.2f}")
print(f"Unique Products Sold: {df_summary['unique_products'][0]}")

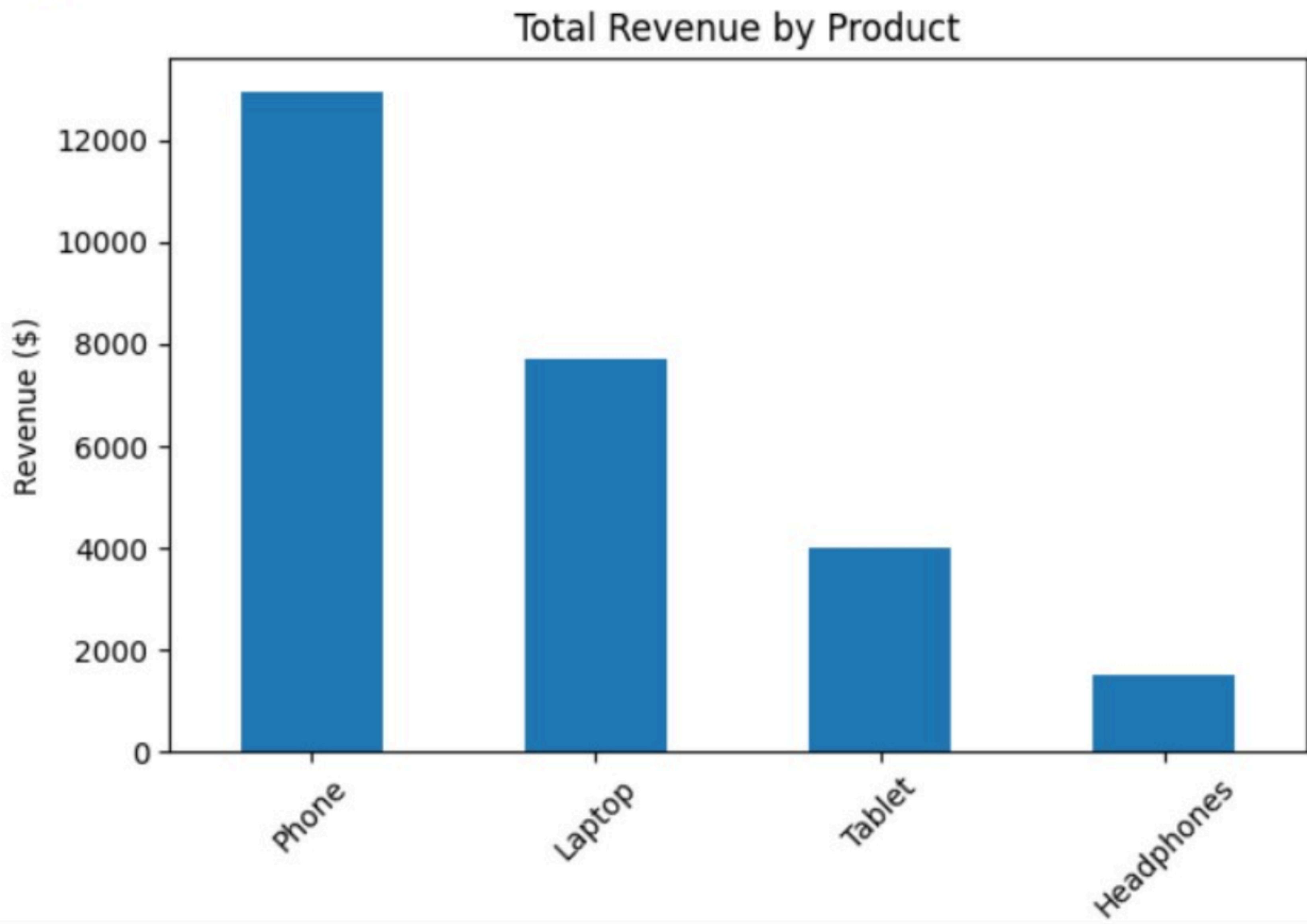
== Sales Summary by Product ==
   product  total_quantity  total_revenue
0    Phone           19        12949.81
1  Laptop            8        7699.92
2  Tablet           12        3999.88
3 Headphones         15        1499.85

== Overall Sales Summary ==
Total Items Sold: 54
Total Revenue: $26,149.46
Unique Products Sold: 4
```

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[44]: # Create a bar chart of revenue by product
plt.figure(figsize=(10, 6))
df_products.plot(kind='bar', x='product', y='total_revenue', legend=False)
plt.title('Total Revenue by Product')
plt.ylabel('Revenue ($)')
plt.xlabel('Product')
plt.xticks(rotation=45)
plt.tight_layout()
```

<Figure size 1000x600 with 0 Axes>



Product

```
[45]: # Save and show the chart  
plt.savefig('sales_chart.png')  
print("\nChart saved as 'sales_chart.png'")  
plt.show()
```

```
Chart saved as 'sales_chart.png'  
<Figure size 640x480 with 0 Axes>
```