

# Step 1: Load SQLite database

```
In [1]: import sqlite3

# Connect (database automatically created if not exists)
conn = sqlite3.connect("sales_data.db")

print("Database connected successfully!")
```

Database connected successfully!

# Step 2: Create table & insert more sample data

```
In [2]: cur = conn.cursor()

# Create sales table
cur.execute("""
CREATE TABLE IF NOT EXISTS sales (
    id INTEGER PRIMARY KEY AUTOINCREMENT,
    order_date TEXT,
    product TEXT,
    quantity INTEGER,
    price REAL
)
""")

# More sample data inserted
sample_data = [
    ("2025-11-01", "Notebook", 10, 2.5),
    ("2025-11-02", "Pen", 50, 0.5),
    ("2025-11-02", "Notebook", 5, 2.5),
    ("2025-11-03", "Pencil", 30, 0.2),
    ("2025-11-04", "Pen", 20, 0.5),
    ("2025-11-05", "Eraser", 15, 0.3),
    ("2025-11-06", "Notebook", 8, 2.5),
    ("2025-11-07", "Marker", 12, 1.0),
    ("2025-11-08", "Highlighter", 10, 1.5),
    ("2025-11-09", "Notebook", 7, 2.5)
]

# Clear table before inserting (optional)
cur.execute("DELETE FROM sales;")
cur.executemany("INSERT INTO sales (order_date, product, quantity, price) VALUES (?)")
conn.commit()

print("Table created and sample data inserted successfully!")
```

Table created and sample data inserted successfully!

## Step 3: Run basic SQL query

```
In [3]: query = """
SELECT
    product,
    SUM(quantity) AS total_qty,
    SUM(quantity * price) AS revenue
FROM sales
GROUP BY product
"""
```

## Step 4: Load SQL results into Pandas

```
In [4]: import pandas as pd

df = pd.read_sql_query(query, conn)
```

```
In [34]: df['revenue'] = df['price'] * df['quantity']
```

## Step 5: Print results

```
In [35]: print(df)
```

	id	order_date	product	quantity	price	revenue
0	11	2025-11-01	Notebook	10	2.5	25.0
1	12	2025-11-02	Pen	50	0.5	25.0
2	13	2025-11-02	Notebook	5	2.5	12.5
3	14	2025-11-03	Pencil	30	0.2	6.0
4	15	2025-11-04	Pen	20	0.5	10.0
5	16	2025-11-05	Eraser	15	0.3	4.5
6	17	2025-11-06	Notebook	8	2.5	20.0
7	18	2025-11-07	Marker	12	1.0	12.0
8	19	2025-11-08	Highlighter	10	1.5	15.0
9	20	2025-11-09	Notebook	7	2.5	17.5

## Step 6: Visualization

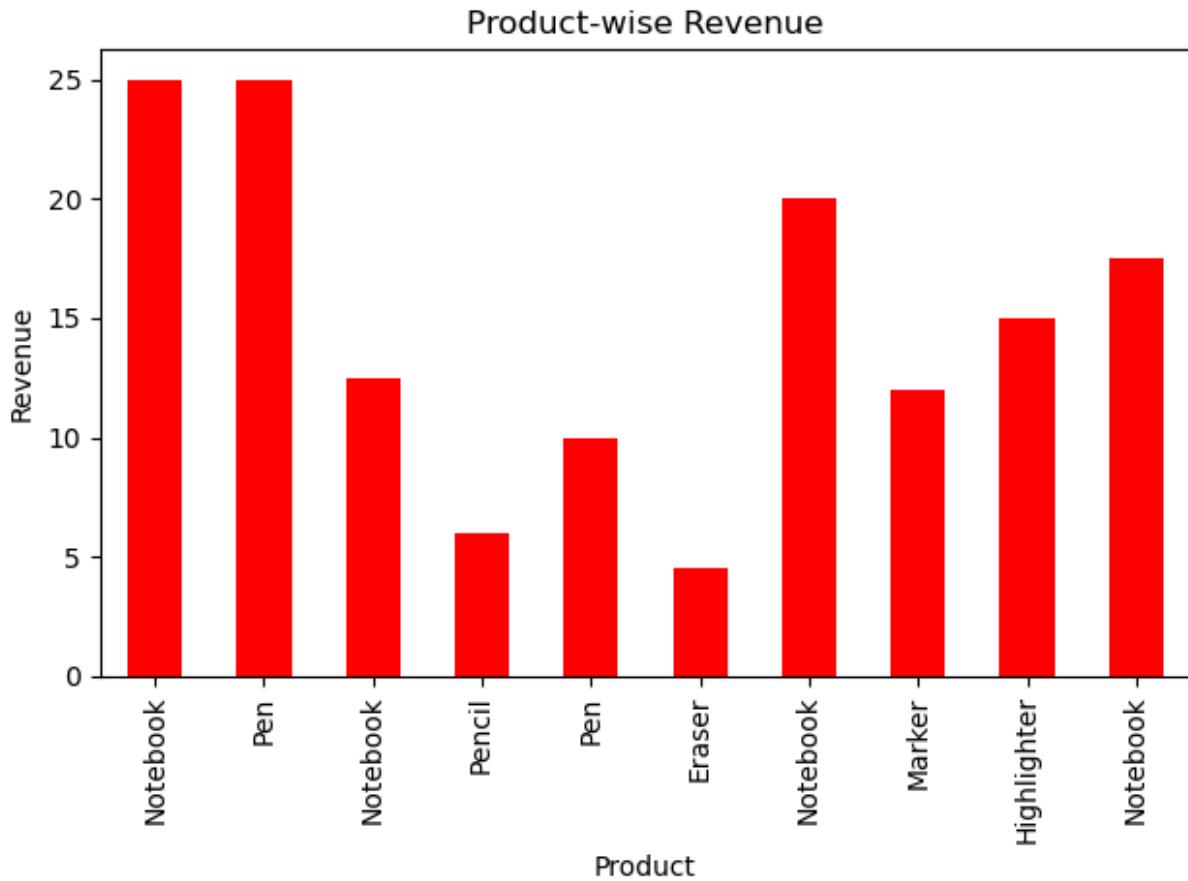
### 1. Bar chart

```
In [50]: import matplotlib.pyplot as plt

df.plot(kind='bar', x='product', y='revenue', legend=False,color='red')
plt.title("Product-wise Revenue")
plt.xlabel("Product")
plt.ylabel("Revenue")
plt.tight_layout()
```

```
# Save chart as PNG
plt.savefig("sales_chart.png")

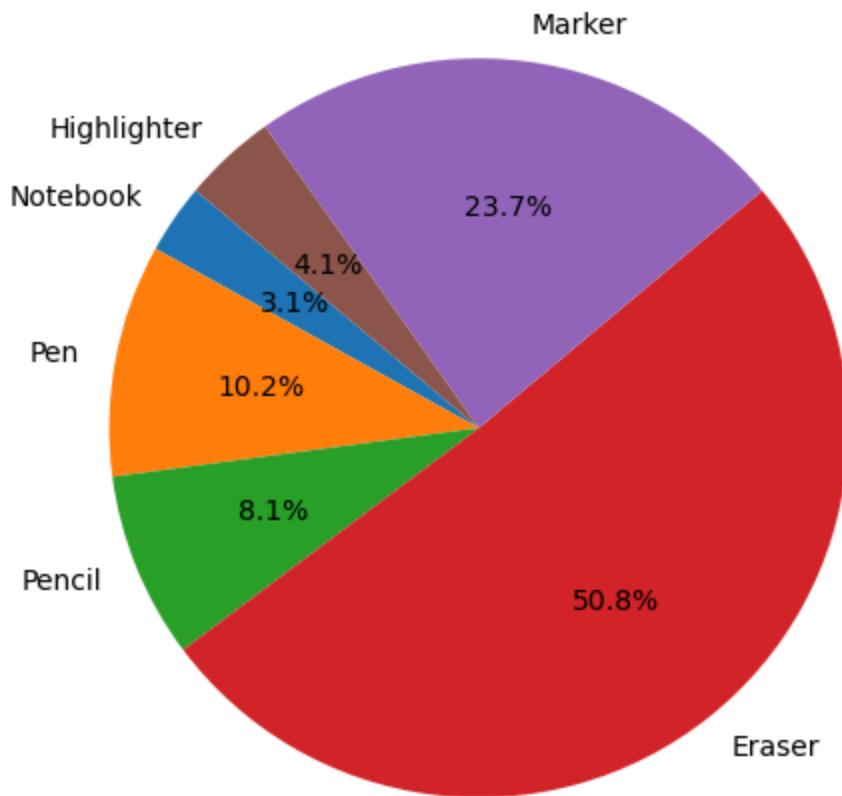
plt.show()
```



## 2. Pie Chart

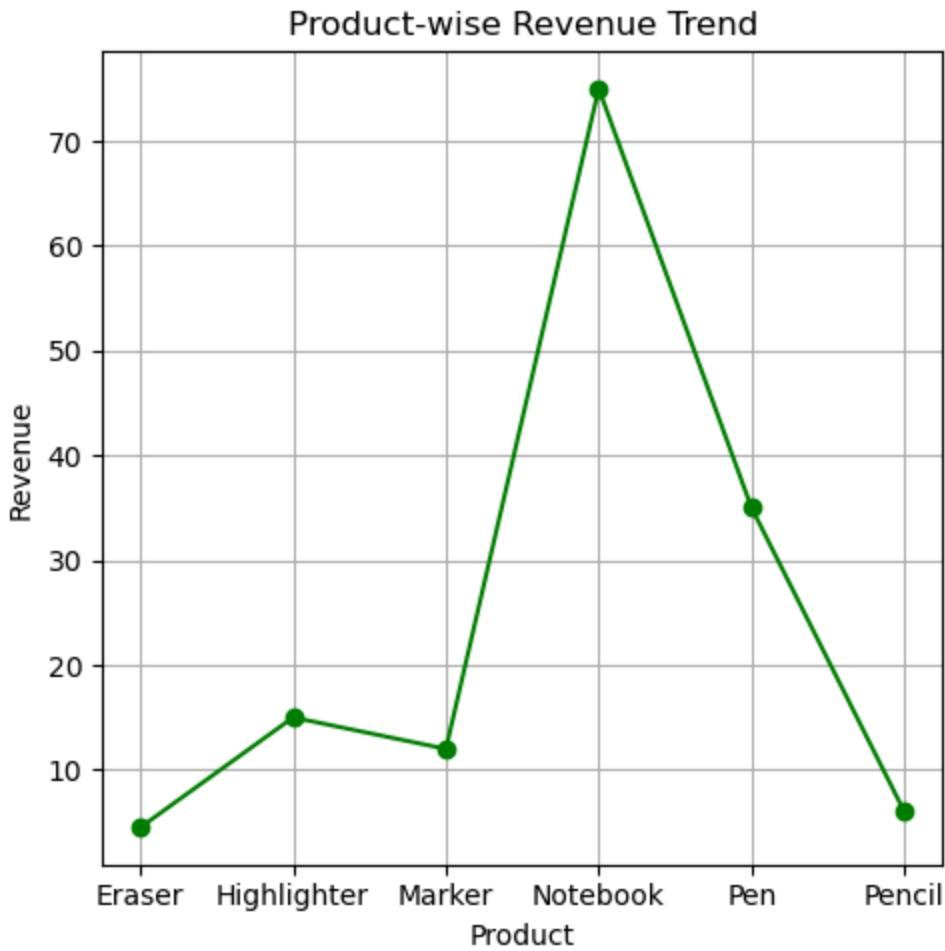
```
In [51]: plt.figure(figsize=(6,6))
plt.pie(
    df.groupby('product')['revenue'].sum(),
    labels=df['product'].unique(),
    autopct='%1.1f%%',
    startangle=140
)
plt.title("Revenue Share by Product")
plt.savefig("sales_chart_horizontal.png")
plt.show()
```

Revenue Share by Product



### 3. Line Chart

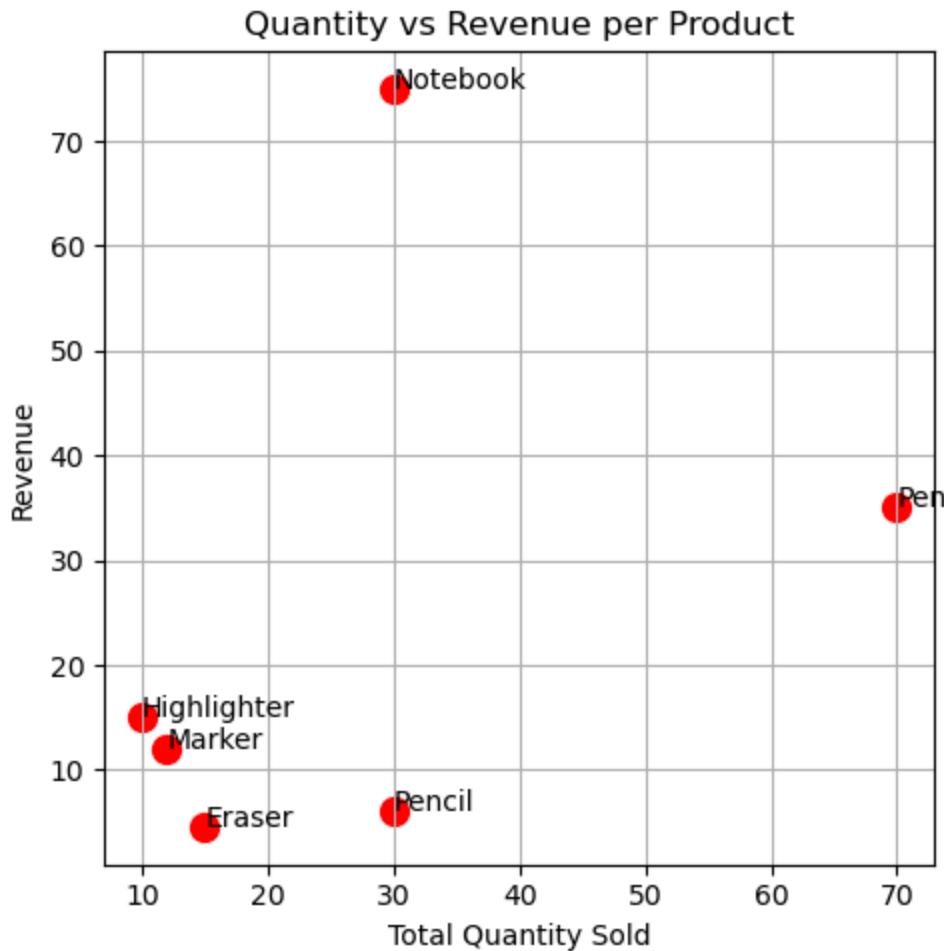
```
In [52]: plt.figure(figsize=(5,5))
df.groupby('product')['revenue'].sum().plot(kind='line', marker='o', linestyle='--',
plt.title("Product-wise Revenue Trend")
plt.xlabel("Product")
plt.ylabel("Revenue")
plt.grid(True)
plt.tight_layout()
plt.savefig("sales_chart_horizontal.png")
plt.show()
```



## 4. Scatter Plot

```
In [53]: plt.figure(figsize=(5,5))
df_summary = df.groupby('product').agg({'quantity':'sum','revenue':'sum'}).reset_index()

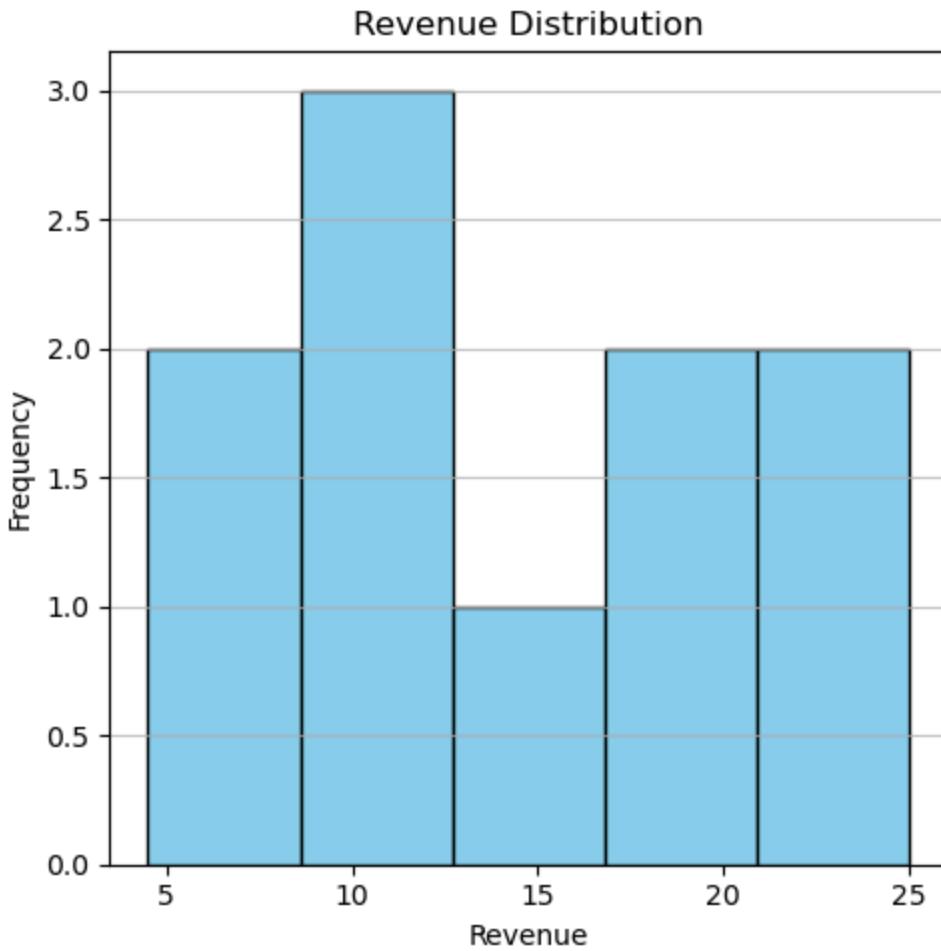
plt.scatter(df_summary['quantity'], df_summary['revenue'], color='red', s=100)
for i, txt in enumerate(df_summary['product']):
    plt.annotate(txt, (df_summary['quantity'][i], df_summary['revenue'][i]))
plt.title("Quantity vs Revenue per Product")
plt.xlabel("Total Quantity Sold")
plt.ylabel("Revenue")
plt.grid(True)
plt.tight_layout()
plt.savefig("sales_chart_horizontal.png")
plt.show()
```



## 5. Histogram

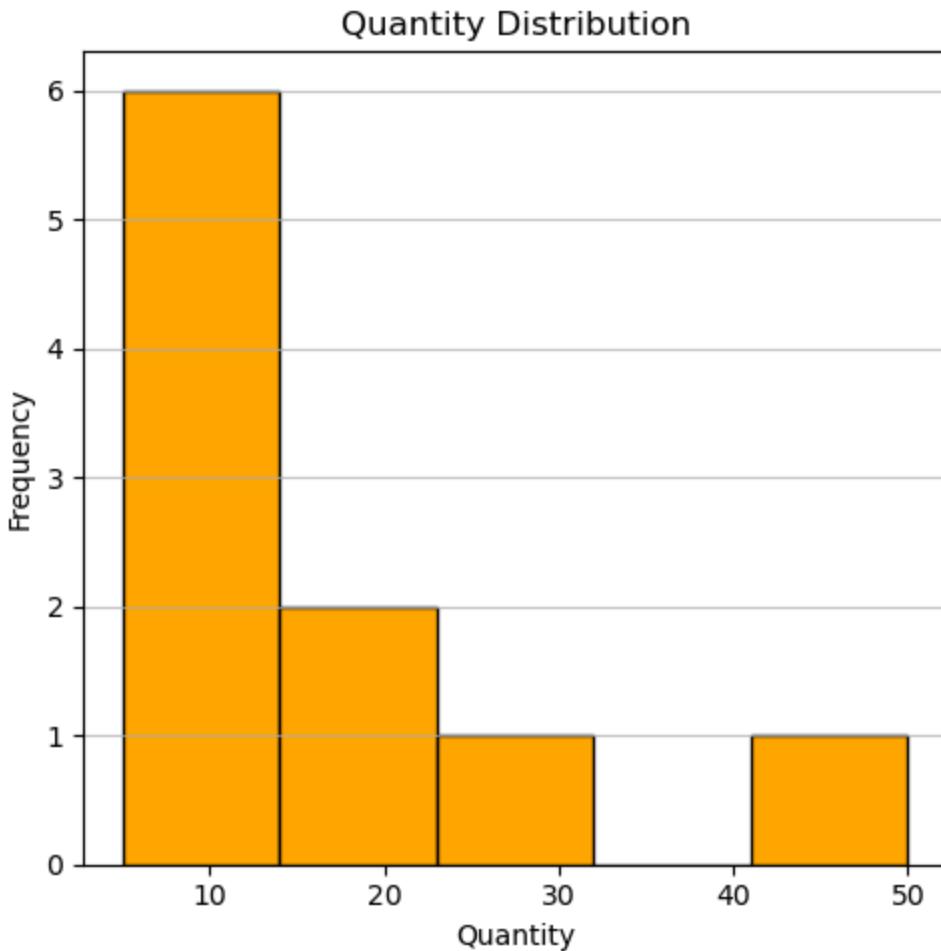
```
In [54]: import matplotlib.pyplot as plt

plt.figure(figsize=(5,5))
plt.hist(df['revenue'], bins=5, color='skyblue', edgecolor='black')
plt.title("Revenue Distribution")
plt.xlabel("Revenue")
plt.ylabel("Frequency")
plt.grid(axis='y', alpha=0.75)
plt.tight_layout()
plt.savefig("sales_chart_horizontal.png")
plt.show()
```



## 5.1 Histogram

```
In [55]: plt.figure(figsize=(5,5))
plt.hist(df['quantity'], bins=5, color='orange', edgecolor='black')
plt.title("Quantity Distribution")
plt.xlabel("Quantity")
plt.ylabel("Frequency")
plt.grid(axis='y', alpha=0.75)
plt.tight_layout()
plt.savefig("sales_chart_horizontal.png")
plt.show()
```



## Step 7 : Save the Chart

```
In [56]: # Save the chart as PNG  
plt.savefig("sales_chart.png")  
  
print("Chart saved as sales_chart.png")
```

Chart saved as sales\_chart.png  
<Figure size 640x480 with 0 Axes>

## Step 8 : Close Connection

```
In [8]: # Close the SQLite connection  
conn.close()  
print("Database connection closed.")
```

Database connection closed.

```
In [ ]:
```