import sqlite3

import pandas as pd

import csv

def run\_sql\_solution(db\_path, output\_file):

conn = sqlite3.connect(db\_path)

cursor = conn.cursor()

query = """

SELECT c.customer\_id AS Customer,

c.age AS Age,

i.item\_name AS Item,

SUM(s.quantity) AS Quantity

FROM customers c

JOIN sales s ON c.customer\_id = s.customer\_id

JOIN items i ON s.item\_id = i.item\_id

WHERE c.age BETWEEN 18 AND 35

AND s.quantity IS NOT NULL

GROUP BY c.customer\_id, c.age, i.item\_name

HAVING SUM(s.quantity) > 0

ORDER BY c.customer\_id, i.item\_name;

"""

cursor.execute(query)

rows = cursor.fetchall()

with open(output\_file, "w", newline="") as f:

writer = csv.writer(f, delimiter=";")

writer.writerow(["Customer", "Age", "Item", "Quantity"])

writer.writerows(rows)

conn.close()

print(f"✅ SQL solution written to {output\_file}")

def run\_pandas\_solution(db\_path, output\_file):

conn = sqlite3.connect(db\_path)

customers = pd.read\_sql("SELECT \* FROM customers", conn)

sales = pd.read\_sql("SELECT \* FROM sales", conn)

items = pd.read\_sql("SELECT \* FROM items", conn)

df = sales.merge(customers, on="customer\_id").merge(items, on="item\_id")

df = df[(df["age"].between(18, 35)) & (df["quantity"].notna())]

agg\_df = (df.groupby(["customer\_id", "age", "item\_name"], as\_index=False)

.agg({"quantity": "sum"}))

agg\_df = agg\_df[agg\_df["quantity"] > 0]

agg\_df.rename(columns={

"customer\_id": "Customer",

"age": "Age",

"item\_name": "Item",

"quantity": "Quantity"

}, inplace=True)

agg\_df.to\_csv(output\_file, sep=";", index=False)

conn.close()

print(f"✅ Pandas solution written to {output\_file}")

if \_\_name\_\_ == "\_\_main\_\_":

db\_path = "sales.db"

method = "sql"

if method == "sql":

run\_sql\_solution(db\_path, "output\_sql.csv")

else:

run\_pandas\_solution(db\_path, "output\_pandas.csv")