

## Using Functions, Subqueries, and ROLAP in SQL Queries

### Physical Table Design of Sale\_Co\_DW.db, QC\_Checks.db, or Company.db

This physical table structure for the three SQLite databases may be obtained via DBBrowser for SQLite or via .schema dot command in sqlite3.exe.

Sale\_Co\_DW.db is more of a data warehouse design having fact tables and dimension tables.

QC\_Checks.db contains quality check errors from the case study reviewed during Week 05.

Company.db contains company data used to illustrate subqueries in Classwork 6.2.

### Exercise:

- 1) Use any of the three databases above to complete each subsection in step 2. Do not use any of the subqueries illustrated in Classwork 6.1 or Classwork 6.2.
- 2) Create five unique, executable queries (2 points), using a minimum of four functions on average ( 2 points), having multiple grouping indexes (2 points), and :
  - a. A Type I subquery (2 points) nested with two inner queries (2 points).
  - b. A Type II subquery (2 points) nested with two inner queries (2 points).
  - c. A Type III correlated subquery (2 points).
  - d. The SELECT projection from a table created by a SELECT statement (2 points) with 5 columns.
  - e. The SELECT projection from tables saved to a CSV file (2 points).
- 3) Submit to Canvas Assignment in one PDF document:
  - a. Your SQL scripts for each query.
  - b. Legible output projection from running each query.

Answers using HMIS.db:

## 2a Type I subquery (2 points) nested with two inner queries (2 points).

```
SELECT State || " --- " || Application || " --- " || Status AS "New_England_App_Status", COUNT(*)
FROM ( SELECT Name, Application, Status, City, State
      FROM ( SELECT Name, Application, Status, City, State
            FROM LEADS
            WHERE State = "ME" OR State = "NH" OR State = "VT" OR
                  State = "NY" OR State = "MA" OR State = "NJ" OR State = "CT" OR
                  State = "RI")
      WHERE Status = "Not Automated" )
GROUP BY New_England_App_Status
ORDER BY New_England_App_Status, COUNT(*);
```

```
sqlite>
sqlite> SELECT State || " --- " || Application || " --- " || Status AS "New_England_App_Status", COUNT(*)
...>      FROM ( SELECT Name, Application, Status, City, State
...>                FROM ( SELECT Name, Application, Status, City, State
...>                      FROM LEADS
...>                      WHERE State = "ME" OR State = "NH" OR State = "VT" OR
...>                            State = "NY" OR State = "MA" OR State = "NJ" OR State = "CT" OR
...>                            State = "RI")
...>                WHERE Status = "Not Automated" )
...>      GROUP BY New_England_App_Status
...>      ORDER BY New_England_App_Status, COUNT(*)
CT --- Computerized Practitioner Order Entry (CPOE)---Not Automated|12
CT --- Electronic Data Interchange (EDI) - Clearing House Vendor---Not Automated|14
CT --- Enterprise EMR---Not Automated|16
CT --- Enterprise Resource Planning---Not Automated|27
CT --- Executive Information System---Not Automated|10
MA --- Computerized Practitioner Order Entry (CPOE)---Not Automated|37
MA --- Electronic Data Interchange (EDI) - Clearing House Vendor---Not Automated|54
MA --- Enterprise EMR---Not Automated|22
MA --- Enterprise Resource Planning---Not Automated|70
MA --- Executive Information System---Not Automated|17
ME --- Computerized Practitioner Order Entry (CPOE)---Not Automated|9
ME --- Electronic Data Interchange (EDI) - Clearing House Vendor---Not Automated|17
ME --- Enterprise EMR---Not Automated|12
ME --- Enterprise Resource Planning---Not Automated|27
ME --- Executive Information System---Not Automated|18
NH --- Computerized Practitioner Order Entry (CPOE)---Not Automated|10
NH --- Electronic Data Interchange (EDI) - Clearing House Vendor---Not Automated|7
NH --- Enterprise EMR---Not Automated|6
NH --- Enterprise Resource Planning---Not Automated|12
NH --- Executive Information System---Not Automated|4
NJ --- Computerized Practitioner Order Entry (CPOE)---Not Automated|39
NJ --- Electronic Data Interchange (EDI) - Clearing House Vendor---Not Automated|42
NJ --- Enterprise EMR---Not Automated|25
NJ --- Enterprise Resource Planning---Not Automated|62
NJ --- Executive Information System---Not Automated|24
NY --- Computerized Practitioner Order Entry (CPOE)---Not Automated|107
NY --- Electronic Data Interchange (EDI) - Clearing House Vendor---Not Automated|125
NY --- Enterprise EMR---Not Automated|83
NY --- Enterprise Resource Planning---Not Automated|162
NY --- Executive Information System---Not Automated|97
RI --- Computerized Practitioner Order Entry (CPOE)---Not Automated|6
RI --- Electronic Data Interchange (EDI) - Clearing House Vendor---Not Automated|4
RI --- Enterprise EMR---Not Automated|1
RI --- Enterprise Resource Planning---Not Automated|10
RI --- Executive Information System---Not Automated|3
VT --- Computerized Practitioner Order Entry (CPOE)---Not Automated|6
VT --- Electronic Data Interchange (EDI) - Clearing House Vendor---Not Automated|5
VT --- Enterprise EMR---Not Automated|3
VT --- Enterprise Resource Planning---Not Automated|5
VT --- Executive Information System---Not Automated|4
sqlite>
```

**2b: A Type II subquery (2 points) nested with two inner queries (2 points).**

```

SELECT City || " --- " || Application || " --- " AS "App_Stat_Top_Urban_TX", Status, COUNT(*)
FROM ( SELECT Name, Application, Status, City, State
      FROM ( SELECT Name, Application, Status, City, State
            FROM LEADS
            WHERE State = "TX")
      WHERE City IN ("Houston", "Dallas", "Austin", "Fort Worth", "El Paso",
                    "San Antonio", "McCallen"))
GROUP BY App_Stat_Top_Urban_TX, Status
HAVING Status = "Not Automated"
ORDER BY App_Stat_Top_Urban_TX, COUNT(*);

```

```

sqlite>
sqlite> SELECT City || " --- " || Application || " --- " AS "App_Stat_Top_Urban_TX", Status, COUNT(*)
...      FROM ( SELECT Name, Application, Status, City, State
...            FROM ( SELECT Name, Application, Status, City, State
...                  FROM LEADS
...                  WHERE State = "TX")
...            WHERE City IN ("Houston", "Dallas", "Austin", "Fort Worth", "El Paso",
...                          "San Antonio", "McCallen"))
...      GROUP BY App_Stat_Top_Urban_TX, Status
...      HAVING Status = "Not Automated"
...      ORDER BY App_Stat_Top_Urban_TX, COUNT(*);
Austin---Computerized Practitioner Order Entry (CPOE) --- |Not Automated|4
Austin---Electronic Data Interchange (EDI) - Clearing House Vendor --- |Not Automated|4
Austin---Enterprise EMR --- |Not Automated|5
Austin---Enterprise Resource Planning --- |Not Automated|3
Austin---Executive Information System --- |Not Automated|3
Dallas---Computerized Practitioner Order Entry (CPOE) --- |Not Automated|10
Dallas---Electronic Data Interchange (EDI) - Clearing House Vendor --- |Not Automated|9
Dallas---Enterprise EMR --- |Not Automated|7
Dallas---Enterprise Resource Planning --- |Not Automated|10
Dallas---Executive Information System --- |Not Automated|7
El Paso---Computerized Practitioner Order Entry (CPOE) --- |Not Automated|6
El Paso---Electronic Data Interchange (EDI) - Clearing House Vendor --- |Not Automated|1
El Paso---Enterprise EMR --- |Not Automated|3
El Paso---Enterprise Resource Planning --- |Not Automated|4
El Paso---Executive Information System --- |Not Automated|1
Fort Worth---Computerized Practitioner Order Entry (CPOE) --- |Not Automated|6
Fort Worth---Electronic Data Interchange (EDI) - Clearing House Vendor --- |Not Automated|8
Fort Worth---Enterprise EMR --- |Not Automated|6
Fort Worth---Enterprise Resource Planning --- |Not Automated|4
Fort Worth---Executive Information System --- |Not Automated|2
Houston---Computerized Practitioner Order Entry (CPOE) --- |Not Automated|18
Houston---Electronic Data Interchange (EDI) - Clearing House Vendor --- |Not Automated|15
Houston---Enterprise EMR --- |Not Automated|12
Houston---Enterprise Resource Planning --- |Not Automated|19
Houston---Executive Information System --- |Not Automated|10
San Antonio---Computerized Practitioner Order Entry (CPOE) --- |Not Automated|13
San Antonio---Electronic Data Interchange (EDI) - Clearing House Vendor --- |Not Automated|13
San Antonio---Enterprise EMR --- |Not Automated|6
San Antonio---Enterprise Resource Planning --- |Not Automated|11
San Antonio---Executive Information System --- |Not Automated|3
sqlite>
sqlite>

```

**2c: A Type III correlated subquery (2 points).**

```

SELECT City || " --- " || Application || " --- " || Status AS "App_Stat_Rural_TX", COUNT(*)
FROM LEADS
WHERE State = "TX" and City IN ( SELECT CITY
                                FROM LEADS
                                WHERE State = "TX" AND City NOT IN ("Houston", "Dallas", "Austin",
                                                                    "Fort Worth", "El Paso", "San Antonio", "McCallen"))
GROUP BY App_Stat_Rural_TX
HAVING Status = "Not Automated"
ORDER BY App_Stat_Rural_TX, COUNT(*)
LIMIT 25;

```

```

sqlite>
sqlite> SELECT City || " --- " || Application || " --- " || Status AS "App_Stat_Rural_TX", COUNT(*)
...> FROM LEADS
...> WHERE State = "TX" and City IN ( SELECT CITY
...>                                FROM LEADS
...>                                WHERE State = "TX" AND City NOT IN ("Houston", "Dallas", "Austin",
...>                                                                    "Fort Worth", "El Paso", "San Antonio", "McCallen"))
...> GROUP BY App_Stat_Rural_TX
...> HAVING Status = "Not Automated"
...> ORDER BY App_Stat_Rural_TX, COUNT(*)
...> LIMIT 25;
Abilene---Computerized Practitioner Order Entry (CPOE) --- Not Automated|2
Abilene---Electronic Data Interchange (EDI) - Clearing House Vendor --- Not Automated|1
Abilene---Enterprise EMR --- Not Automated|2
Abilene---Enterprise Resource Planning --- Not Automated|2
Abilene---Executive Information System --- Not Automated|1
Alice---Computerized Practitioner Order Entry (CPOE) --- Not Automated|1
Alice---Electronic Data Interchange (EDI) - Clearing House Vendor --- Not Automated|1
Allen---Enterprise Resource Planning --- Not Automated|1
Allen---Executive Information System --- Not Automated|1
Alpine---Computerized Practitioner Order Entry (CPOE) --- Not Automated|1
Alpine---Enterprise EMR --- Not Automated|1
Alpine---Enterprise Resource Planning --- Not Automated|1
Amarillo---Computerized Practitioner Order Entry (CPOE) --- Not Automated|1
Amarillo---Electronic Data Interchange (EDI) - Clearing House Vendor --- Not Automated|2
Amarillo---Enterprise Resource Planning --- Not Automated|2
Amarillo---Executive Information System --- Not Automated|1
Aransas Pass---Electronic Data Interchange (EDI) - Clearing House Vendor --- Not Automated|1
Aransas Pass---Enterprise Resource Planning --- Not Automated|1
Aransas Pass---Executive Information System --- Not Automated|1
Arlington---Computerized Practitioner Order Entry (CPOE) --- Not Automated|2
Arlington---Electronic Data Interchange (EDI) - Clearing House Vendor --- Not Automated|1
Arlington---Enterprise EMR --- Not Automated|1
Arlington---Enterprise Resource Planning --- Not Automated|1
Arlington---Executive Information System --- Not Automated|1
Athens---Computerized Practitioner Order Entry (CPOE) --- Not Automated|1
sqlite>

```

Remove the LIMIT 25 clause from the SQLite script to see the complete rural hospital listing.

The correlated subquery above is an example of not using EXISTS.

**2d: A SELECT projection from a table created by a SELECT statement (2 points) with 5 columns.**

```
CREATE TABLE TX_DALLAS_HOSPITALS AS
```

```
SELECT *
```

```
FROM LEADS
```

```
WHERE State = "TX" AND City = "Dallas";
```

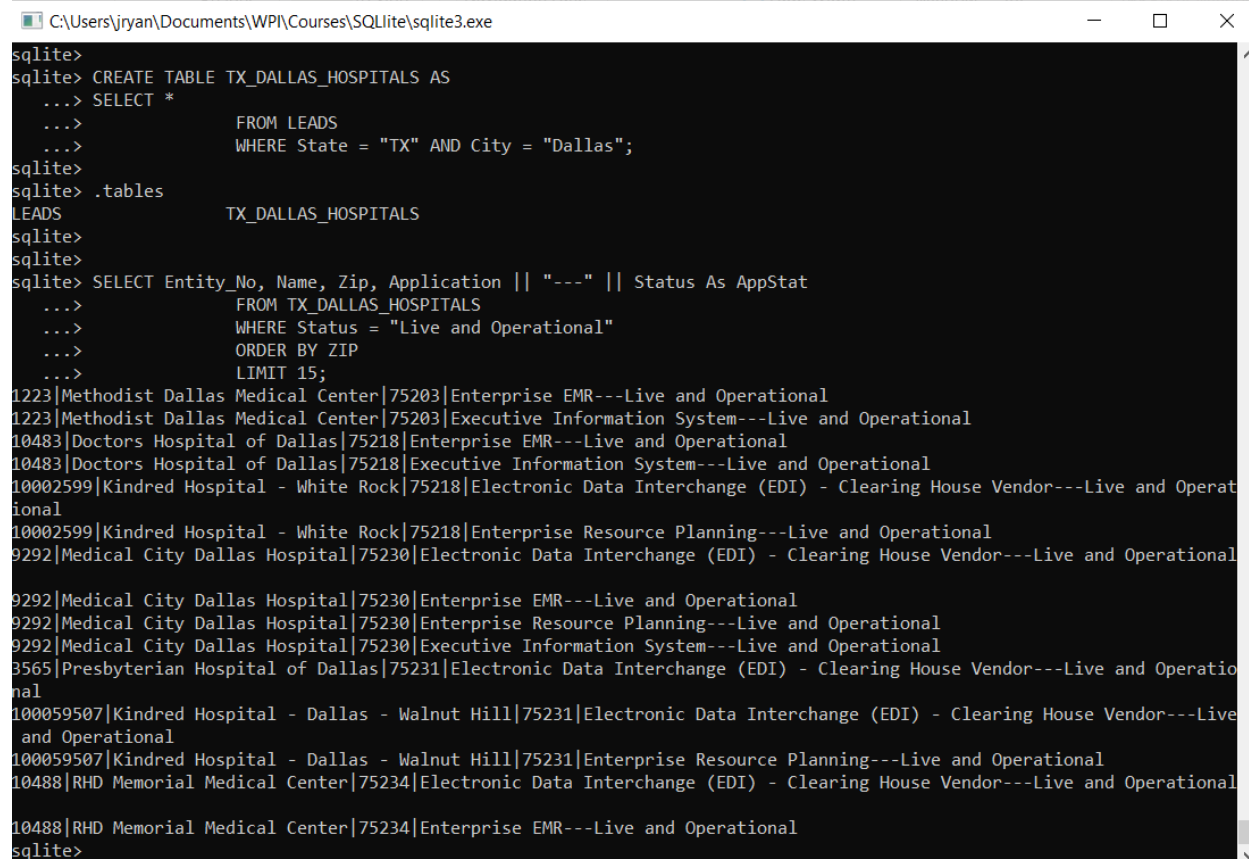
```
SELECT Entity_No, Name, Zip, Application || "----" || Status As AppStat
```

```
FROM TX_DALLAS_HOSPITALS
```

```
WHERE Status = "Live and Operational"
```

```
ORDER BY ZIP
```

```
LIMIT 15;
```



```
C:\Users\jryan\Documents\WPI\Courses\SQLite\sqlite3.exe
sqlite>
sqlite> CREATE TABLE TX_DALLAS_HOSPITALS AS
...> SELECT *
...> FROM LEADS
...> WHERE State = "TX" AND City = "Dallas";
sqlite>
sqlite> .tables
LEADS          TX_DALLAS_HOSPITALS
sqlite>
sqlite>
sqlite> SELECT Entity_No, Name, Zip, Application || "----" || Status As AppStat
...> FROM TX_DALLAS_HOSPITALS
...> WHERE Status = "Live and Operational"
...> ORDER BY ZIP
...> LIMIT 15;
1223|Methodist Dallas Medical Center|75203|Enterprise EMR---Live and Operational
1223|Methodist Dallas Medical Center|75203|Executive Information System---Live and Operational
10483|Doctors Hospital of Dallas|75218|Enterprise EMR---Live and Operational
10483|Doctors Hospital of Dallas|75218|Executive Information System---Live and Operational
10002599|Kindred Hospital - White Rock|75218|Electronic Data Interchange (EDI) - Clearing House Vendor---Live and Operational
10002599|Kindred Hospital - White Rock|75218|Enterprise Resource Planning---Live and Operational
9292|Medical City Dallas Hospital|75230|Electronic Data Interchange (EDI) - Clearing House Vendor---Live and Operational
9292|Medical City Dallas Hospital|75230|Enterprise EMR---Live and Operational
9292|Medical City Dallas Hospital|75230|Enterprise Resource Planning---Live and Operational
9292|Medical City Dallas Hospital|75230|Executive Information System---Live and Operational
3565|Presbyterian Hospital of Dallas|75231|Electronic Data Interchange (EDI) - Clearing House Vendor---Live and Operational
100059507|Kindred Hospital - Dallas - Walnut Hill|75231|Electronic Data Interchange (EDI) - Clearing House Vendor---Live and Operational
100059507|Kindred Hospital - Dallas - Walnut Hill|75231|Enterprise Resource Planning---Live and Operational
10488|RHD Memorial Medical Center|75234|Electronic Data Interchange (EDI) - Clearing House Vendor---Live and Operational
10488|RHD Memorial Medical Center|75234|Enterprise EMR---Live and Operational
sqlite>
```

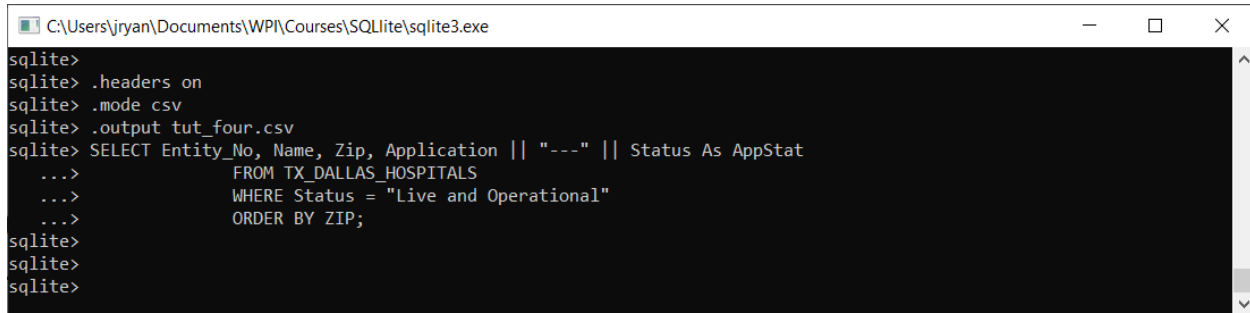
**2e: The SELECT projection from tables saved to a CSV file (2 points).**

.headers on

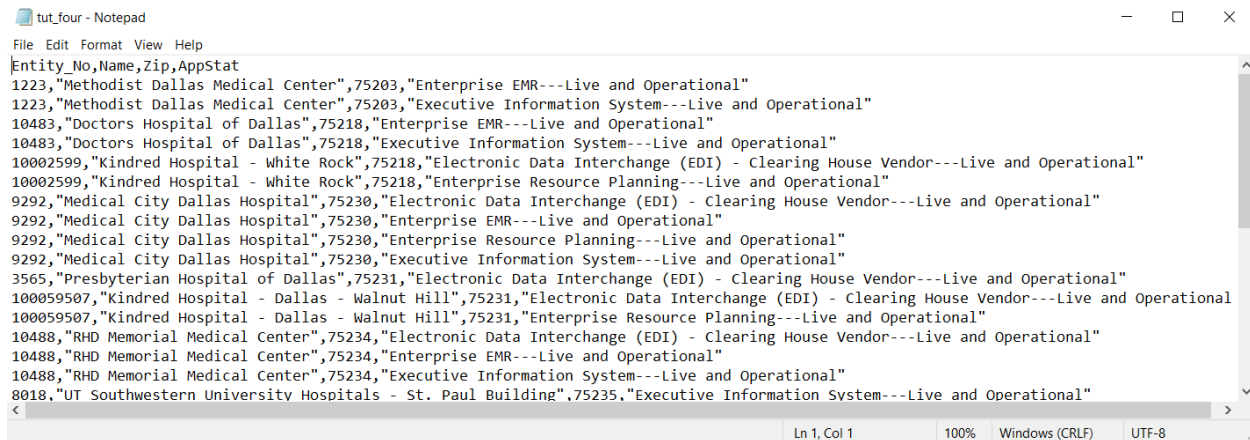
.mode csv

.output tut\_four.csv

```
SELECT Entity_No, Name, Zip, Application || "----" || Status As AppStat
FROM TX_DALLAS_HOSPITALS
WHERE Status = "Live and Operational"
ORDER BY ZIP;
```



```
C:\Users\jryan\Documents\WPI\Courses\SQLite\sqlite3.exe
sqlite>
sqlite> .headers on
sqlite> .mode csv
sqlite> .output tut_four.csv
sqlite> SELECT Entity_No, Name, Zip, Application || "----" || Status As AppStat
...>          FROM TX_DALLAS_HOSPITALS
...>          WHERE Status = "Live and Operational"
...>          ORDER BY ZIP;
sqlite>
sqlite>
sqlite>
```



```
tut_four - Notepad
File Edit Format View Help
Entity_No,Name,Zip,AppStat
1223,"Methodist Dallas Medical Center",75203,"Enterprise EMR---Live and Operational"
1223,"Methodist Dallas Medical Center",75203,"Executive Information System---Live and Operational"
10483,"Doctors Hospital of Dallas",75218,"Enterprise EMR---Live and Operational"
10483,"Doctors Hospital of Dallas",75218,"Executive Information System---Live and Operational"
10002599,"Kindred Hospital - White Rock",75218,"Electronic Data Interchange (EDI) - Clearing House Vendor---Live and Operational"
10002599,"Kindred Hospital - White Rock",75218,"Enterprise Resource Planning---Live and Operational"
9292,"Medical City Dallas Hospital",75230,"Electronic Data Interchange (EDI) - Clearing House Vendor---Live and Operational"
9292,"Medical City Dallas Hospital",75230,"Enterprise EMR---Live and Operational"
9292,"Medical City Dallas Hospital",75230,"Enterprise Resource Planning---Live and Operational"
9292,"Medical City Dallas Hospital",75230,"Executive Information System---Live and Operational"
3565,"Presbyterian Hospital of Dallas",75231,"Electronic Data Interchange (EDI) - Clearing House Vendor---Live and Operational"
100059507,"Kindred Hospital - Dallas - Walnut Hill",75231,"Electronic Data Interchange (EDI) - Clearing House Vendor---Live and Operational"
100059507,"Kindred Hospital - Dallas - Walnut Hill",75231,"Enterprise Resource Planning---Live and Operational"
10488,"RHD Memorial Medical Center",75234,"Electronic Data Interchange (EDI) - Clearing House Vendor---Live and Operational"
10488,"RHD Memorial Medical Center",75234,"Enterprise EMR---Live and Operational"
10488,"RHD Memorial Medical Center",75234,"Executive Information System---Live and Operational"
8018,"UT Southwestern University Hospitals - St. Paul Building",75235,"Executive Information System---Live and Operational"
Ln 1, Col 1    100%  Windows (CRLF)  UTF-8
```