Database Design Worksheet (M)

Summer ‘20

Follow the steps outlined in this worksheet to meet the requirements for the Mastery level of the Database Design Core Learning Target. Answer each question. The steps in this worksheet do not have to be performed in one sitting.

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| I | Translating a data model to a database design. |
|  | Translate this simplistic model of airline flights to SQL Data Definition Language, populate it with test data, and execute a few representative queries on it. Deliver the code in a single text file.  The assignment is divided into parts. Mark the file with comments indicating the beginning and end of the answers to the questions. |
|  | Note that the file should execute successfully--whether there is a database with a matching name or not. You should be able to execute the file twice in a row and have it execute successfully. This means you will need to include “DROP” commands, and, where appropriate, conditional clauses in commands (e.g., “CREATE … IF NOT EXISTS…”). |
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|  | There is no “A” line after the questions in I and II, since they’ll be answered in an attached file. |
| QI.1 | Comment the text of your file, indicating the creation of the database. |
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| QI.2 | Comment the text of your file, indicating the creation of the tables. (Column note: You may use any abbreviations you choose for DayOfWeek abbreviations. I use MTWRFSN. Use yours consistently.) |
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| QI.3 | Comment the text of your file, indicating the creation of the Primary Keys. |
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| QI.4 | Comment the text of your file, indicating the creation of the Foreign Keys. |
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| QI.5 | Comment the text of your file, indicating the creation of any additional indexes which you think may be useful in the performance of this application. Explain why you created each index.  Feel free to speculate on the potential size of any tables, and any queries you expect may be frequently performed. |
|  | (Reminder: Only create indexes on columns that are not already indexed with PK, FK, or UK constraints.) |
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| QI.6 | (Optional) If you have prior experience with databases, do you see any opportunities for the use of other database objects? Identify any such objects and explain briefly in comments in your file. |
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| II | Populate the database. |
| QII.1 | Populate the database, so that the queries in section III produce one or more rows. Please provide data about real airports, real airlines and (less important) real flights. Check Expedia.com, Orbitz.com, southwest.com or any other site or combination of sites you wish. Each day [this](https://www.iflyboise.com/flights/flight-status/) site lists the flights in and out of Boise on that day. Comment your file showing the beginning and end of the INSERTs. |
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| III. | Query the new database. |
|  | The objective of the exercise is for each of these queries to produce results. If you discover that the query does not produce any results, add new data (and/or revise your query) until it does. Please read these requirements closely. In most cases where students have erred in prior classes, students have submitted queries which meet only part of the requirement. Important terms have been underlined for emphasis. |
|  | In response to these questions, comment your file so it is clear which question the query is answering. |
|  | Use at least one Common Table Expression (CTE) in each query. You may also find that the set operations are useful for writing these queries. |
| III.1 | Choose an airport for this query. List several details from Market, Route and Flight tables of flights to that airport, plus flights from that airport. |
| A | (Show a snapshot here of the results from this query.) |
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| QIII.2 | Choose two airports for this query. List the airlines that fly routes both from the first airport, and to the second airport. To further clarify, show an airline only if it flies both from the first airport and to the second airport.  Hint: Look back at early practices where you were asked to find customers who bought one item and a second item. |
| A | (Show a snapshot here of the results from this query.) |
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| QIII.3 | Choose a day of the week and an airline. Show details of the flights on that day of the week, except those flown by your selected airline. |
| A | (Show a snapshot here of the results from this query.) |
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| IV | Reflection |
| QIV.1 | What mistakes did you make -- and recover from; what other insights did you gain from this exercise? |
| A | I did mostly syntax errors as I am using CTE for the first time. But, at the same, time I realized how powerful CTE is as it can be self-referencing as well as can be referenced multiple times. |