SA8902 Assignment #2 – Spatial Database

Value: 40%

For the second assignment you are required to create a spatially enabled SQL Server database about a topic of your own choosing. This means you could create a database focusing on a business theme, a Hospitals/Medical theme, or an environmental theme, or any other theme that is of interest to you, as long as the database topic is geographically focused. Your choice of database topic should be structured around the idea that your database will be used to answer a set of GEOGRAPHIC research questions that you will choose. Once your database is constructed you will create a series of SQL Server queries that will be used to answer those questions. You will need to go through the entire data modelling process to construct your database, including normalization of whatever existing data you decide to use, Entity-Relationship modelling, a detailed explanation of your ER model, construction of a Data Dictionary, and the final design of the SQL Server database. You will be expected to provide documentation about every stage of the database design and construction process, similar to what was provided in assignment one.

For the data used in your database, the data you use can be real or 'improvised' data. For example, if you chose to create a database focusing on the theme of retail geography, you are unlikely to be able to find real data about CUSTOMERs to use in your database, although this would essentially be a mandatory component of your database. In this instance, you can create your own dataset of CUSTOMER data for use in your database. Other elements of your database like demographic data are readily available through the Ryerson University Spatial Data library, Scholars GeoPortal, or open data websites such as the City of Toronto Open Data Portal (http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=9e56e03bb8d1e310VgnVCM10000071d60f89RCRD&vgnextfmt=default) and should not be created from scratch.

Your submission should include the following:

1. A hard copy written report that includes:
    a. Definition of the research questions you intended your database to help answer. You should define at least 5 research questions that could be answered with help from your database.
    b. A detailed discussion of the stages of data modeling and database design
    c. An ER diagram with a discussion describing the data model
    d. A data dictionary that corresponds to your actual database design
    e. A section justifying the spatial data type you chose to use in your database
    f. An explanation of the difference between the geography and geometry datatypes
    g. A detailed explanation of spatial indexes and how they are used in relational databases.
    (Continued….)
    h. Written copies of SQL Statements that would assemble the data in your database to help provide answers to your research questions. These SQL Statements each need to make use of spatial SQL.

    i. An explanation of each SQL statement and how it helps to answer your GEOGRAPHIC research questions.
2. A .zip file saved in the format LastName-FirstName.zip containing:
    a. An electronic version of your report.
    b. A SQL Server backup file (.bak) that contains your database
    c. SQL Server query statement files (.sql) that help to answer your GEOGRAPHIC research questions.

3. Your database should include spatially enabled tables wherever appropriate.
4. Your database is also required to implement at least one spatial index.