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CS 325 - Fall 2021

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Additional Information

- **Project Requirements:** As discussed with Professor Tuttle, no M:N relationship has been included and instead an association relationship has been used in place of this requirement.
- **Geospatial Data Generation:** ArcMap was used to create a portion of the geospatial data that is stored in the database, including latitude and longitude positions for stormwater BMPs, latitude and longitude positions for sampling locations, and sampling location drainage areas. The ArcMap folder contains the following files.
  - StormwaterSampling.pdf - A site map displaying the geospatial data. Displays streams, roads, BMP locations, sampling locations, BMP and outfall drainage areas, and flow direction arrows.
  - StormwaterSampling.mpk - An ArcMap Map Package file that contains the created geospatial information layers.
  - StormSamplingGeodatabase folder - Contains the geodatabase created in ArcMap.
  - Table_Export folder - Contains the exported geospatial data text files that were used to create csv text files corresponding to the database tables.
- **Insert Statement Automation:** C++ was used to automate the creation of table insert statements due to the volume of data. The cpp folder contains the following files.
  - csv text files for each database table
  - sql_insert.h and sql_insert.cpp - Contain the declaration and definition for the sql_insert function. The sql_insert function reads a csv file and appends prompt statements and insert statements to a SQL population file. The script creates insert statements where all values are specified and also creates insert statements for rows with null values.
  - main.cpp - Declares an array of table names and calls the sql_insert function for each table.  Creates the file 325populate.sql, which contains prompt statements

and insert statements for each table. Note that the 325populate.sql file was later edited to include comments and to limit line-lengths to 80 characters.

- **Data Volume:** The database contains 12 tables and 1,194 rows of data.
- **Sources:** 14 sources were used. One source is quoted in 325design.sql, and the remaining sources were used during the creation of data. One citation appears in 325design.sql, and the remaining citations appear in 325population.sql.
- **Functions/Statements Used:**
  - check statements in 325design.sql.
  - to_date function in 325population.sql to create date values with time.
  - nls_date_format is altered in date-format.sql and time-forma.sql. These scripts are called within the 325show-contents.sql script.
  - spool with append in 325show-contents.sql in order to not spool "session altered."
  - Creation of views in 325queries.sql and 325report1.sql.
  - months_between function in 325queries.sql.
  - union of select statements in 325queries.sql and 325report1.sql.
  - to_char function to add a percent sign to numbers in 325report3.sql.