SQL and SSQL

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Definitions

- SQL = Structured Query Language
- SSQL = Spatial SQL
- GPL = Graphical Presentation Language

SQL- A Review

- SQL is a simple language used to query (question) an ODBC-compliant database and retrieve data.
- SQL is not simple or standard
- S = structured

Structure

- The most basic SQL statement is:
  - SELECT * from *database.table*
- Let's dissect this statement
  - SELECT is the command
  - * is a wildcard = everything and anything
  - Database.table is the target of the query

A Little More…

- The previous SQL statement selected everything from a table
- How do we select only a portion of a table?
  - The WHERE CLAUSE

WHERE CLAUSE

- WHERE *conditional operator*
- For example:
  - SELECT * from database.table WHERE CITY_NAME = 'Pocatello'

Types of Conditional Ops

- Simple (as in the previous example)
- Compound
  - Let's say we want to select and work with the records describing Pocatello and Blackfoot
- We could select and work with them individually using two simple conditional operators…OR…

Combining Conditional Operator Expressions

- Instead of:
  - SELECT * from database.table WHERE CITY_NAME = 'Pocatello'
  - …do some work, and then
  - SELECT * from database.table WHERE CITY_NAME = 'Blackfoot'
  - …do some more work

We Can Use…

- A Compound expression combining two or more single expressions using either:
  - AND
  - OR
- In our examples, which shall we use?

OR

- SELECT * from database.table WHERE CITY_NAME = ‘Pocatello’
  OR
  CITY_NAME = ‘Blackfoot’

Why OR?

- Before a record (entity) is returned as a result of a query, the record must satisfy EACH WHERE clause if AND is used.
- When OR is used, a record must satisfy only one of the WHERE clauses.

This is SQL

- What is SSQL?
  - Spatial Structured Query Language
  - Or SQL for Spatially enabled relational databases
    - Oracle
    - Informix
    - IBM DB2
    - MS SQL Server

An Example

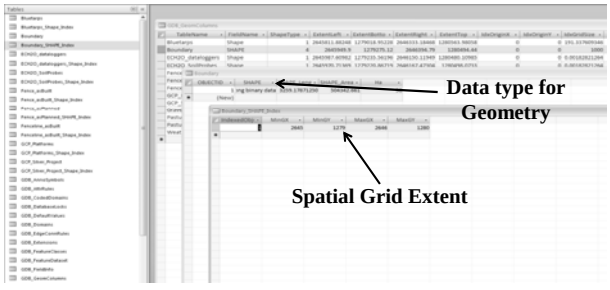
- SELECT *residence.geometry*
  FROM residence
  WHERE Type = 'single family'

What is different about this expression?
residence.geometry

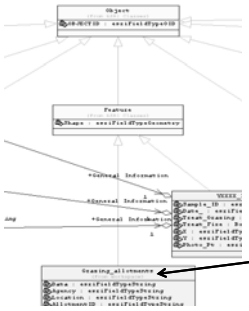
Why is **.geometry* important?*

- Until now, we have been returning all fields (SELECT * FROM…)
- Now, we only want to see the *geographic feature(s)* returned by the query
- To do that, we instruct SSQL to select the geometry (*.geometry*) of the TABLE of interest (residence)

GIS Layers are Tables?



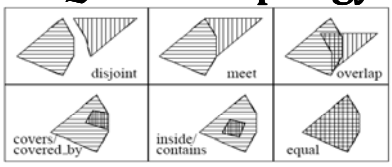
Object Relational



- OBJECTID inherited from Object class
- SHAPE inherited from a class called Feature

This could be "Boundary"

SSQL with Topology



- Similar to intersect and union
- These are conditional operators that are written into the WHERE clause

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Key Concepts

- SQL is highly structured
- Spatial SQL builds upon SQL but remains within the general framework
- SSQL requires an object relational, spatially enabled database
- The *.geometry table is queried to return features
  - which are stored in the table as a LOB field
  - Along with other topological attributes

Questions?

- Your assignment is:
  - Review basic SQL (if you feel it necessary)
  - Read Egenhofer's early (1994) manuscript on Spatial SQL theory
  - Read the Spatial Data Extender white paper
  - Review the ArcGIS SSQL Help (use the link)
  - Complete the IBM DB2 SSQL exercise