Database Design Concepts and Practices

IT4GIS

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Basic Steps in Database Design

- ☑ Understand and document the business' needs.
  - Problem statement
  - Business object types
  - Business relationships
  - Business constraints
- ☑ Create an ERM
- ☑ Data and process inventory
- ☑ Develop tuple types
- ☑ Tuple types to tables
- Integrity
- Implement the database

Today's goal

- Become more familiar with database design.
- Learn to read and interpret a database design (aka, schema).

Database Design

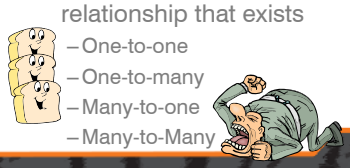
- Why spend so much time and effort?
  - Efficiency (speed, storage)
  - Client satisfaction
  - Flexibility
  - Cost savings realized

Design Considerations

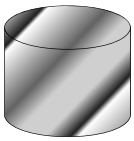
- Basic steps (described earlier)
- Data types
- Normalization
- With >1 table, relationships must be examined

Relationships

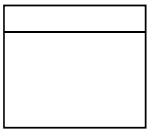
- Determine where relationships exist between tables
- Determine the type of relationship that exists
  - One-to-one
  - One-to-many
  - Many-to-one
  - Many-to-Many



Generic Design Symbology



= Database



= Table

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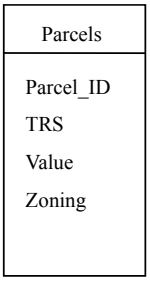
Generic Table Symbology



- Table name
- Divider
- List of all attributes stored in this table as they will appear in the table

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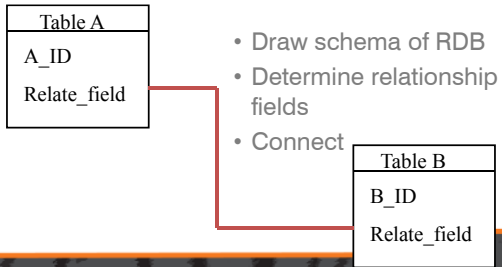
Generic Relationship Symbology



- Draw schema of RDB
- Determine relationship fields
- Connect

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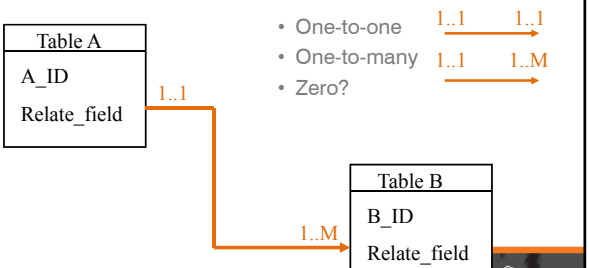
Symbolizing Relationship Type



- One-to-one 1..1 1..1
- One-to-many 1..1 1..M
- Zero?

The Relationship Type…

- Also known as
  - Cardinality (ArcGIS terminology)
  - Multiplicity (UML terminology)

Object Oriented Design

How does it fit?

Process


Inception


Elaboration

- Construction
- Transition

Elaboration Exercise

- Divide into task force teams
  - Red team
  - Blue team
- Create a list of things that are:
  - Red
  - Blue
- Brainstorm for 5 minutes

Questions?

- Your assignment
  - Follow the ReadMe.txt document in this week's exercise file.
  - Use the exercise handout as a guideline to reading and interpreting a relational database design.