GIS 520
Data Cardinality

Data Cardinality

Outline

- Table Associations
- Data cardinality
- Methods for creating relationships in ArcGIS

Table Associations

- Establishing associations between tables will allow accessing data in all related tables.

- Associations in ArcGIS can be established between multiple data formats: such as shapefiles, ArcInfo tables, feature classes in personal geodatabase, or tables in an ArcSDE enterprise geodatabase.

- Establishing associations between a layer (spatial context) and a table (additional attributes) will allow:

    a) to symbolize or label features based on attributes from the joined table or
    b) to view records in a corresponding table when attributes are selected in the related table

- The way tables are related to one another is called **cardinality**.

Data Cardinality

There are four cardinality types:

- **one-to-one**
- **many-to-one**
- **one-to-many**
- **many-to-many**

It is important to understand which **relationship type** is present between the tables to prevent potential record emission error.

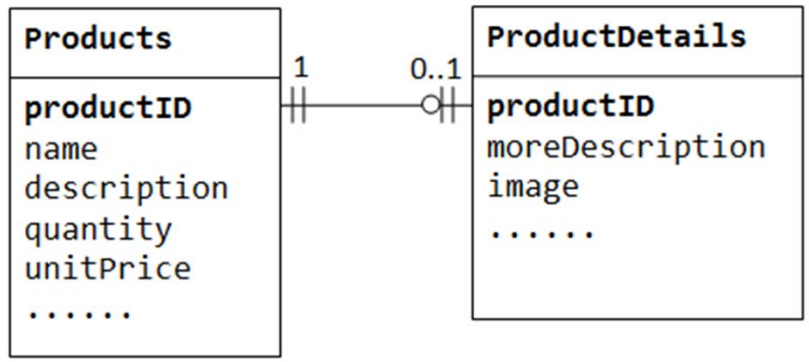
For more information on the basics of Relationships and ArcGIS,
view ArcGIS Resource Center online
http://help.arcgis.com/en/arcgisdesktop/10.0/help/index.html#/Relationships_and_ArcGIS/004t000000001000000/

Methods for creating relationships in ArcGIS

In ArcMap relationships can be created by **joining** or **relating** tables together

Use Join: for **one-to-one** or **many-to-one** relationship between a layer and a table

Database Example: one-to-one relationship from a database where the unique identifier of Product ID is used to join two tables



Methods for creating relationships in ArcGIS

In ArcMap relationships can be created by **joining** or **relating** tables together.

Use relate: if there is a **one-to-many** or a **many-to-many** relationship between a layer and a table.

EPA: Example one-to-many relationship: Coordinator is assigned one Region, which spans many States

Table A

Coord.	EPA Reg
John	1
Judy	2
Doug	3
Bob	4
Larry	5
Sue	6
Frank	7

Table B

EPA Reg.	State
3	PA
3	WV
3	DE
4	TN
4	NC
1	RI
2	NY

EPA Region	State	Coord.
3	PA	Doug
3	WV	Doug
3	DE	Doug
4	TN	Bob
4	NC	Bob
1	RI	John
2	NY	Judy

Methods for creating relationships in ArcGIS

Differences between join and relate:

Join:

- All columns from both tables are **appended together** into one large table.
- It will allow to **symbolize or label features** based on attributes from the join table.
- Permits only **one-to-one** or **many-to-one** cardinality.
- Incorrect cardinality results in omitted records.

Relate:

- **Temporary association** is established between the tables, which is saved in an Arc Map document.
- The related **tables are viewed separately**.
- It will **not allow to symbolize or label features** based on attributes from the relate table.
- Can be created between tables of **all cardinality types**.
- Can be created regardless of the cardinality between tables without the danger of omitting information.

Methods for creating relationships in ArcGIS

The basics of creating relationships between tables include:

- Finding **the common information** between the tables
- Understanding **how values in each join column match**

In order to associate tables:

- **Common information has to exist** in both tables
  such as: county name, zipcode, building ID, parcel ID, etc.
- Common information has to be stored as the **same data type** in each table

The names of the columns to be related do not have to be the same
The **data type** and **values** in both columns must be the same