



















Data Type Parameters Supported in ArcGIS

- FLOAT < n_p,n_s>
 - n_{precision(total field length)}
 - n_{scale} (decimal places)
 - n must be between 1-6 (larger n values need to use DOUBLE)
 - n_p,n_s = 5,3 → 26.589 is OK, 256.381 is not
 - Five (5) total characters 2 6 . 5 8 9

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Beware of the 64-bit OBJECTID

- The new Esri 64-bit OBJECTID allows practically unlimited number of records in a geodatabase table
- HOWEVER, it is not supported by older versions of ArcGIS and is not supported in the shapefile. Thus these data:
 - $-\operatorname{Can}$ only be used in current versions of ArcGIS
 - Do NOT support Open GIS
 - Cannot be exported for use in other software (QGIS, Idrisi Terrset, etc.)

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Data Table Pages

- Most enterprise RDBMS use data table pages
- Data Table Pages follow rules
 - -All fields for each record with *standard* data types are contained within a single data page.
 - -There is a maximum of 255 records stored on each page.
- The ART of efficient data modeling is to minimize wasted space on a page while maximizing the proportion of each page written.

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Storing Vector Coordinates in a ORDBMS

- DB2 Spatial Extender (and other spatially enabled databases) allow you to integrate geographic (spatial) data with your existing business data. This includes:
 - Data types such as points, lines, and polygons
 - Functions such as area, endpoint, and intersect
 - An indexing scheme for spatial data

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• What about Oracle, MS SQL Server, and PostGreSQL?



















Discovering CLASSES

- Simple Rule:
 - Look for nouns in descriptions
 - Obviously not all nouns are classes
 - But at least this approach can allow one to create a list of $\ensuremath{\textit{candidate}}$ $\ensuremath{\textit{classes}}$

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What is an OBJECT

• An instance of a CLASS

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- That contains meaningful data
- OBJECTS occupy memory space at runtime – If not, they are CLASSES
 - For example: data type vs. double

























Instantiate into an *Object* (to make into an instance)

- Three features characterize OBJECTS and distinguish OBJECTS from CLASSES:
 - <u>Identity</u>: specific attribute (property) settings have been made for the class. This distinguishes it from all other objects.
 - State: Describes the data stored in the object WHERE DID THIS COME FROM?

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 Behavior: describes the method in the object's <u>interface</u> through which the object can be used (how do we make the dog bark?)







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Database Design

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

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Design Considerations

- Basic steps (described earlier)
- Data types/Data Modeling

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- Normalization
- With >1 table, relationships <u>must</u> be examined

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