Foreign Keys

A field or collection of fields in a “source” table that you use to relate to rows in another “target” table

Not the primary key of the table, but relates to the primary key of the target table

Need to be careful about referential integrity, that is, make sure there is not a one to many or many to many relationship from the source to target tables
<table>
<thead>
<tr>
<th>CUST_CODE</th>
<th>AGENT_CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>C00013</td>
<td>A003</td>
</tr>
<tr>
<td>C00001</td>
<td>A008</td>
</tr>
<tr>
<td>C00020</td>
<td>A008</td>
</tr>
<tr>
<td>C00025</td>
<td>A011</td>
</tr>
<tr>
<td>C00024</td>
<td>A006</td>
</tr>
<tr>
<td>C00015</td>
<td>A003</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AGENT_CODE</th>
<th>AGENT_NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>A007</td>
<td>Ramasundar</td>
</tr>
<tr>
<td>A003</td>
<td>Alex</td>
</tr>
<tr>
<td>A008</td>
<td>Alford</td>
</tr>
<tr>
<td>A011</td>
<td>Ravi Kumar</td>
</tr>
</tbody>
</table>

Primary Key | Foreign Key | Primary Key
Entity-Relationship Diagrams

ODM 1.0
Streamflow Measurement
Water Quality
Multiple Stations
Multiple Variables - flow, or
Instruments Vary
Methods Vary - River Discharge Estimates

Rating Curve

Flow Cross Section
The CUAHSI Hydrologic Information System (HIS) is an internet-based system for sharing hydrologic data. It is comprised of databases and servers, connected through web services, to client applications, allowing for the publication, discovery and access of data.

Key Components of CUAHSI-HIS:

- **HIS Central**
  - Data Discovery

- **HydroServer**
  - Data Publication
  - Water and Spatial Data

- **HydroDesktop and other clients**
  - Data Access

- **Metadata Services**
  - Service Registration
  - Catalog Harvesting

- **Search Services**
  - Geographic Semantic, Time and Network Search

There are three types of computers that store and process data:
Our Primary Item - An Observation

### DataValues

- ValueID {PK}
- DataValue
- ValueAccuracy
- LocalDateTime
- UTCOffset
- DateTimeUTC
- SiteID {FK}
- VariableID {FK}
- OffsetValue
- OffsetTypeID {FK}
- CensorCode
- QualifierID {FK}
- MethodID {FK}
- SourceID {FK}
- SampleID {FK}
- DerivedFromID
- QualityControlLevelID {FK}

### DataValues: Table

<table>
<thead>
<tr>
<th>ValueID</th>
<th>DataValue</th>
<th>ValueAccuracy</th>
<th>LocalDateTime</th>
<th>UTCOffset</th>
<th>SiteID</th>
<th>Vari</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>05/01/2006 00:00:00</td>
<td>-7</td>
<td>1</td>
<td>1</td>
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<tr>
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<td>05/01/2006 01:00:00</td>
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<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Foreign Keys Connect Tables here, datavalues table to variable table
Foreign Keys
Connect Tables here, datavalues table to methods table
Full Set of Cuahsi Tables
ER Diagram, SSURGO Soils Data
Entity-Relationship Diagram Notation

General notation:

- how each A is related to B’s
- how each B is related to A’s

Example:

class has exactly one official instructor

is instructor of zero or more

Relationship symbols:

- zero or one
- zero or more
- exactly one
- one or more