Which is SQL statement would select the name Jackson (in a Shapefile)?
(What does _ mean? What does % mean?)

- “NAME” = “Jackso_”
- “NAME” LIKE ‘%son’
- “NAME” LIKE “Jack_”
- “NAME” = ‘%son’

Which selects “cities with 500 to 700 people”?

- “POP” > 500 AND < 700
- “POP” > 500 OR “POP” < 700
- “POP” > 500 AND “POP” < 700
- “POP” > 500 OR “POP” < 700
In this database Join, which statement is **wrong**?

**Click on Counties to start the joining operation**

**Click on States to start the joining operation**

**Counties (3400 features)**

<table>
<thead>
<tr>
<th>Shape</th>
<th>NAME</th>
<th>STATE_NAME</th>
<th>STATE_ABBR</th>
<th>POP1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polygon</td>
<td>Lake of the Woods</td>
<td>Minnesota</td>
<td>MN</td>
<td>27663</td>
</tr>
<tr>
<td>Polygon</td>
<td>Fargo</td>
<td>Washington</td>
<td>WA</td>
<td>3816251</td>
</tr>
<tr>
<td>Polygon</td>
<td>Stevens</td>
<td>Washington</td>
<td>WA</td>
<td>788406</td>
</tr>
<tr>
<td>Polygon</td>
<td>Des Moines</td>
<td>Washington</td>
<td>WA</td>
<td>1322782</td>
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<tr>
<td>Polygon</td>
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<td>Arizona</td>
<td>AZ</td>
<td>8308800</td>
</tr>
<tr>
<td>Polygon</td>
<td>Sedona</td>
<td>Arizona</td>
<td>AZ</td>
<td>88600</td>
</tr>
<tr>
<td>Polygon</td>
<td>Flathead</td>
<td>Montana</td>
<td>MT</td>
<td>489776</td>
</tr>
</tbody>
</table>

**States (50 features)**

<table>
<thead>
<tr>
<th>STATE_NAME</th>
<th>STATE_ABBR</th>
<th>POP1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawaii</td>
<td>HI</td>
<td>110822</td>
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<tr>
<td>Washington</td>
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<td>Montana</td>
<td>MT</td>
<td>788406</td>
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<tr>
<td>Maine</td>
<td>ME</td>
<td>1322782</td>
</tr>
<tr>
<td>North Dakota</td>
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<td>8308800</td>
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<tr>
<td>South Dakota</td>
<td>SD</td>
<td>88600</td>
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<tr>
<td>Wyoming</td>
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<td>489776</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>WI</td>
<td>489776</td>
</tr>
</tbody>
</table>

**Joined table will have 3400 features**

**STATE_NAM(E) is the **key** field for joining here**

- The spatial operators test relationships between two layers at a time.
  - The target layer is the one containing the features to be **selected**
  - The source layer is the one containing the features being compared to.
  - Do not confuse these with destination/source concepts from Joining!

**Spatial operators**

- Spatial queries can employ a number of operators to test the basic conditions of:
  - intersection (green)
  - proximity (distance) (red)
  - containment
- (Ignore 3D and Clementini operators for now)
With earlier selection - rivers within one state:

Manual or SQL selection - then spatial sub selection

SQL query after spatial selection

Cities within 50mi of earthquakes

Having > 500,000 people

Scale and accuracy issues

- When testing spatial relationships, consider that features are often generalized when created

Consider selecting cities that lie on (intersect) rivers.
A single point or line cannot adequately represent location at this scale. Selection becomes a hit or miss affair.
Use a buffers distance to allow a little room for error (points)

Proximity (distance) operators

Volcanoes within 100 km of an interstate

Counties that are within 200 miles of Denver (Target: Cities -> select Denver)
Proximity (within distance) exercise

- Which >100,000 people cities are within 30 miles of an earthquake of Magnitude > 7.0
- definition query for:
  cities POP2010 > 100000
  earthquakes MAG > 7.0
- Use selected features, save selection in new layer 
  - optional: Which state has the most of these cities?

Select Counties within 200 miles of Denver?
- To Select Denver:
  - A) Manually - make Counties the only selectable layer first or
  - B) Select by Attribute: SQL query: ___________________
- Optional: How many of these Counties does each state have?

Containment operators

- Features that enclose all of another feature contain it.
- Within is the inverse of contain

A
B

Intersection operators

- Features intersect when any part of one feature touches, crosses, or overlaps another feature.

"special cases" of intersecting features.
Mini-project 1 Maps

- Here are some maps about **population change** from the last years
- show population change in absolute numbers or % or standard deviations (sigmas)
- Let's analyze the classification scheme and the color strategy
- Is this effective? Do you quickly get the gist? Does it look good?
Lab

- HW 6: ch5: 1, 2, 4, 5 and 7 (extra: 3 and 10)
- Tut: ch 5, 20 to 40
- Next week: Spatial Joins (Ch 6)
- next-next week:
  - Midterm preparation (think about questions for review session)
  - Start with mini project 2