Learning to recognize patterns is important when working with data and data access. For this class, you need to recognize patterns in business requests for data and also sql patterns that are helpful for solving the business tasks.

Patterns help you to learn to recognize similarities between tasks (in the bluntest term- which demo is like a task on an assignment or exam). You may have solved the business task already. There is not a lot of difference between "Finding the names of the clients and the names of all of their animals" and "Finding the name of a publisher and the titles of all of the books they publish".

We have covered a number of comparatively simple types of queries. That does not mean they were always easy to learn; but they were queries that answered simpler questions- such as "Show me the names of the clients who have a cat. " or "Show me the id and names of the dogs that are more than 10 years old." We are now ready to move into more interesting queries.

- Show me the names of the clients who have a cat and a dog.
- Show me the names of the clients who have a cat but do not have a dog.
- Which staff person has done the most exams in the current year to date?
- Show me the most recent exam date for each of the reptiles.

What I would like you to do is think of similar types of queries in another field. For example, in the medical field, you might think of questions/queries such as:

- Show me the clients who are prescribed both medication A and medication B. We are concerned that these two medications are incompatible.
- Show me the clients who are taking medication C but not medication D. Maybe we just found out that medication C works better if the person also takes medication D.
- What is the most recent ALT blood test for each of our clients?
- Show me the top 100 clients in terms of their most recent ALT score.

What I would like you to see is that there are certain patterns of queries that are logically the same across various databases.

- Which vet clients have a cat but do not have a dog?
- Which of our Altgeld Mart customers have an order in the previous year but do not have an order in the current year?
- Which of our students have completed any of the 'CS15%A' classes but have not enrolled in any of the 'CS15%P' classes?

Patterns and Implementations

We discussed the unmatched rows pattern in the previous unit and implemented this with an outer join and a null test and also with a Not In subquery test where we had to consider the possibility of nulls in the subquery. We will see other ways to implement this logic over the semester. In the assignments, I often require a specific technique so that you have a chance to see and learn techniques. As the semester progresses you should keep a list of patterns and various implementation possibilities. The more tools you have in your tool box the better.

Examples:

1. (vets) Display all clients by name and the names of their reptiles. Include only clients who have a reptile.
This uses two tables and a filter on the animal type. You could use an inner join. We need both the client name and the animal name.
2. (vets) Display all clients by name who have a reptile.
This uses two tables and a filter on the animal type. You could use an inner join or a subquery.
3. (vets) Display all reptiles with no exam data.
This uses two tables and a filter on the animal type. You could use an outer join or a subquery.