

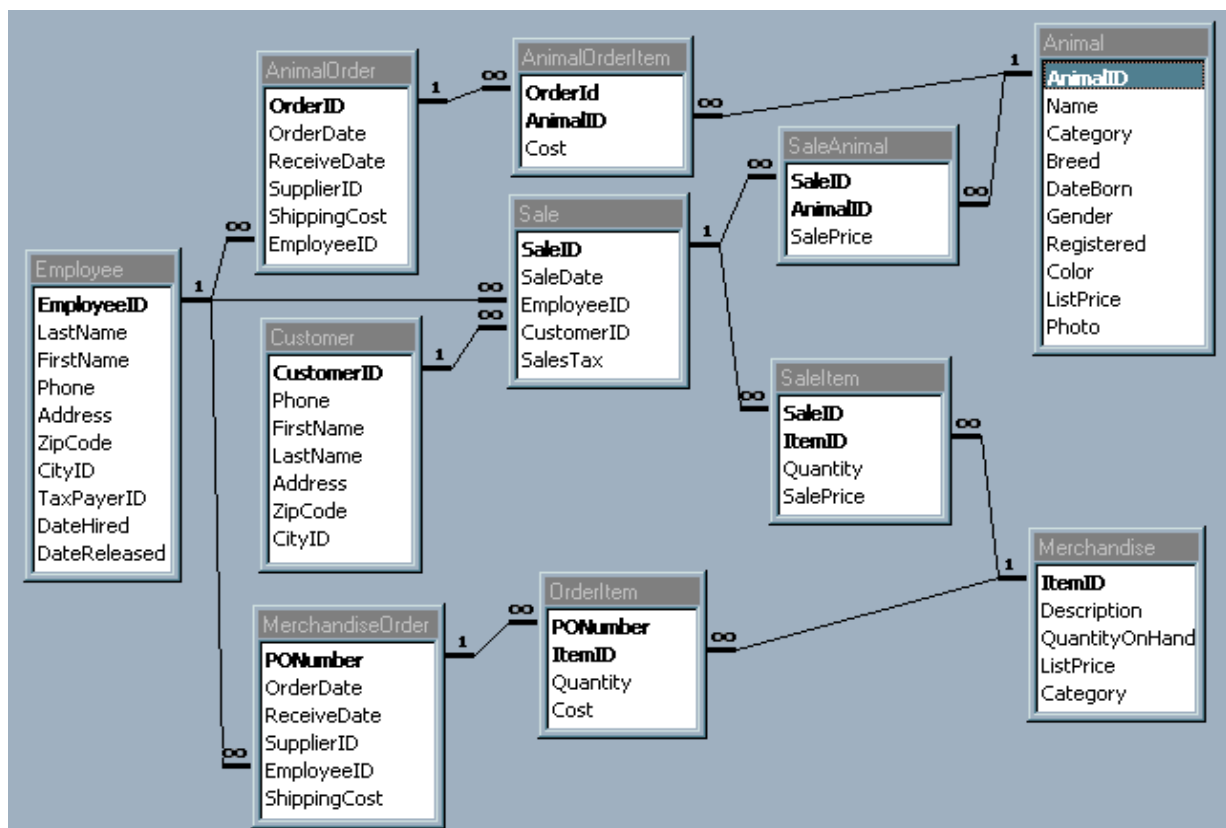
## Biomedical Informatics (BIOM9450) Tutorial 2: Database Design and SQL

Due 7<sup>th</sup> October 2021 by 5pm, online

### Objectives

This will serve as assessment of your understanding of Structured Query Language using Microsoft Access. Background

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Copy the 'PetStore' database from Moodle.

Note that the database has had a number of tables (city/address information) removed for the purpose of clarity. Even with these deleted tables it is a relatively complicated structure. The database is centred on a 'Sale' table. A single employee and customer is associated with each sale. Sales may be of two types, either the sale of an animal or the sale of merchandise items. Animal sales are tracked using a 'SaleAnimal' table that has a link to an 'Animal' table with more details on the actual animal. Merchandise sales are tracked using a 'SaleItem' table that has a link to a 'Merchandise' table with more details on the actual items. Multiple merchandise items (as specified by the 'quantity' field in the 'SaleItem' may be bought at the one time.

Separate tables are used to order more animals ('AnimalOrderItem' and 'AnimalOrder') or merchandise ('OrderItem' and 'MerchandiseItem'). These tables are not used for this particular tutorial.

## Tasks

1. Open the database using Microsoft Access and view each of the tables and the entity-relationship diagram. Browse the table data and mentally recreate the links between tables.
2. Switch to the queries tab and examine each of the queries discussed in lectures. Note that there are 3 modes of previewing a query - 'Design View' (graphical Query By Example), 'Datasheet View' (output of query) and 'SQL View' (underlying SQL statements). The most complicated queries have no corresponding 'Datasheet View' and must be written in SQL. For the simpler queries, the Query builder supplied with Access is a two-way development environment. This means that you may either modify the graphical constructs or type in the SQL statements and the other view is automatically updated.
3. Answer the following questions by writing appropriate queries. Design your queries using a mixture of graphical and SQL statements as the final exam questions will test your knowledge of SQL and not the graphical query builder. If you get stuck remember to use the on-line help facility or refer to similar queries in the lecture notes.
  1. Which customers (IDs and names) bought which animals (IDs and names)? Ensure that you display the customer name in a single column in a "LASTNAME, Firstname" format. e.g. "SMITH, Joe". Sort by lastname then firstname. (**Score: 2**)
  2. List the number of items of merchandise each employee has sold. Do not forget to include the 'quantity' sold in your calculation i.e. if two bags of dog food and four packets of bird seed were sold this would count as 6 items. Sort by employee lastname. (**Score: 2**)
  3. How many cats are in the database and how many have been sold (you MUST change the join condition from an INNER to a LEFT join to produce the answers to demonstrate your knowledge of this concept)? (**Score: 2**)
  4. List in descending order the total dollar amount sold (include merchandise items and animals) for each SaleID. You may need to use a UNION function on two separate queries. (**Score: 1**)
  5. List the number of animal orders and the total price of these orders that were received within two weeks (14 days or less) of being ordered. (**Score: 1**)

6. Which customers who bought merchandise, also bought animals at the same time? In your answer exclude those names where the animal category did not match the merchandise category. (**Score: 1**)
7. For those animals that have a name, list it along with the animal ID. In the same query, for those animals that do not have a name, list the animal ID and the string 'Unknown' in the animal name column. (**Score: 1**)
4. You will need to submit your Petstore database via Moodle for marking. Make sure you delete all other queries in the database except the answers to these tutorial questions and label the answers T1 through T7 to facilitate marking.

**Submission: Please put the file into a single zip file and submit on Moodle.**