

# HW4: Normalized schema and ERD for Pet-Fish

## 1. The situation

"Get-Your-Pet-Fish-Today" company currently uses a legacy flat file system to store all of its information. The owner of the store, Alice Nose-Ikwel wants to implement a Web-enabled database application. This would enable branch stores (that all have the same fish assortment) to enter data regarding inventory levels, ordering, and so on. Presently, the data for inventory and sales tracking are stored in one single text file that has the following format:

StoreName, PetName, Pet Description, Price, Cost, SupplierName, ShippingTime, QuantityOnHand, DateOfLastDelivery, DateOfLastPurchase, DeliveryDate1, DeliveryDate2, DeliveryDate3, DeliveryDate4, PurchaseDate1, PurchaseDate2, PurchaseDate3, PurchaseDate4, LastCustomerName, CustomerName1, CustomerName2, CustomerName3, CustomerName4

## 2. Your task

Assume that you want to track all purchase and inventory data, such as who bought the fish, the date that it was purchased, the date that it was delivered, and so on. The present file format allows only the tracking of the last purchase and delivery as well as four prior purchases and deliveries. You can assume that a type of fish is supplied by only one supplier.

- a) Show all functional dependencies between the different "attributes" shown above (you can draw the dependency diagram either vertically or horizontally)
- b) This file format is not yet in 1NF. Design a 1NF schema that has one single table.
- c) Design a normalized data model (that may include additional attributes) for Alice's company and show that your data model is in 3NF (by drawing all FDs).
- d) Draw the ER diagram based on the normalized relations.

## 3. Details

"DeliveryDate" is not when the pet was delivered to the new owner but to the store.

## 4. Collaboration Policy

We randomly assign you to groups of 2 or 3 students. You will have to submit your individual homework on Blackboard, but we allow you to exchange ideas and brainstorm on solution ideas \*within\* the randomly assigned group of students. If you received help from one of your assigned team mates, then acknowledge the help of your team mate in your homework submission (e.g., "Alice's comments helped with when I was stuck on question 14". Any received help from within the group does not count against you. At the end of the semester, we ask everyone to rate the helpfulness of the team mates you were paired up throughout the semester.

## 5. Deliverables

1. **PPTX:** Create a 4-slide PowerPoint deck with your solutions to the problem (each answer to a, b, c, and d on one single slide) and submit it to Blackboard. I will collect all the slide-decks into one PowerPoint file and we may discuss some interesting solutions in class. Be prepared to justify your conclusions in class. Please make sure to include your name on the slide (or all the names of the group members in case you worked together) on the slide and start from our template (or any other template as long as it is in format 16:9 and not, e.g., 4:3).
2. **File naming convention:** As always: Use following naming convention for all submitted documents: If your name is "Ellie Golding", and this is homework "4", then name your document for this homework as "HW4\_Golding.PPTX" before uploading to Blackboard.

## 6. Some tips

1. You will have to understand entity-relationship diagrams (ERDs), relational modeling (RM), and database normalization for this homework.
2. **Notation:** I recommend you to draw the solutions first with paper and pen, before you use Lucidchart or PowerPoint any other tool to draw the diagrams with a computer.
3. The answer to c) needs to include PKs, FKs, and all Functional Dependencies (FDs). The answer to d) does not include any FKs (recall: no FKs in ERDs!).