COMP 306 | Database Management Systems
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Assignment #4 - Aquarium Logical Diagram Report

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We added a new entity “Customer” to our ER diagram with a primary key CustomerID and an age attribute while also creating a relational attribute “date”. The age attribute may be useful to identify which exhibits are frequented by which age groups while the “date” attribute will identify in which times of the year the aquarium is visited more. We also changed some attributes in sub-entities of “Employee”, such that we store the animal family type that the veterinarians and caretakers are responsible of. We also changed the security guards’ attributes to reflect their security expertise and the ability to use guns if necessary. These employees were related to the “Exhibit” entity in the first ERD but we changed that to the “Aquarium” entity since we thought they should be in charge of the whole aquarium.

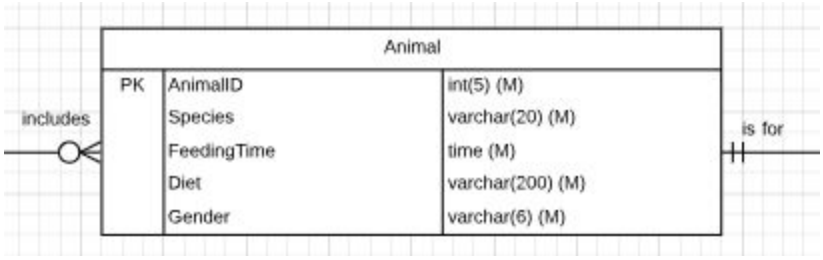
The primary and foreign keys of each entity can be seen in the Logical Diagram pdf, defined by the straight and dashed underlined attributes respectively. We also included a second Logical Diagram pdf without relation arrows for domain constraints and functional dependencies so that the main LD wouldn’t get too crowded.

We figured out that the “Animal” entity was in 2NF form since species attribute inside “Animal” entity had transitive dependency. So we created a new entity for the “Species” attribute of the old “Animal” entity to make it BCNF.

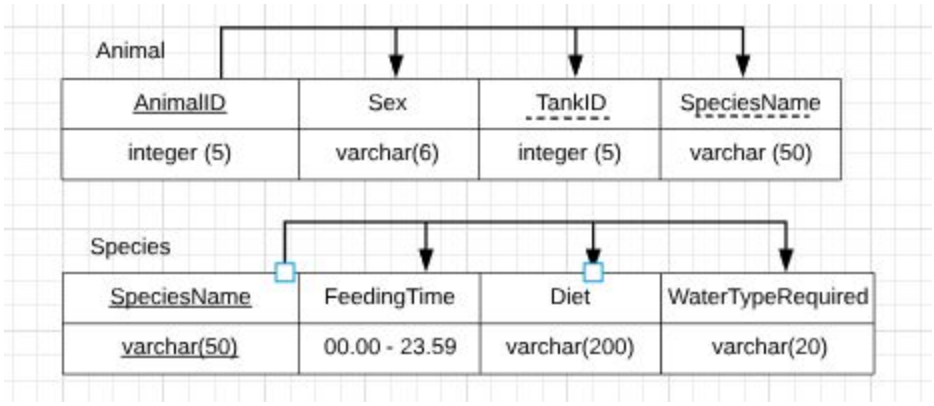
ER-Diagram Link: https://www.lucidchart.com/invitations/accept/916e7ea9-f55d-4072-bb71-be559812ee7b
Logical Design: https://www.lucidchart.com/invitations/accept/3338ae2d-0f72-429f-a53d-6db8ed148e2c
Dependencies: https://www.lucidchart.com/invitations/accept/7607cf0e-e03c-46cc-bbab-1ff6249ce169

“Animal” dependency before normalization:

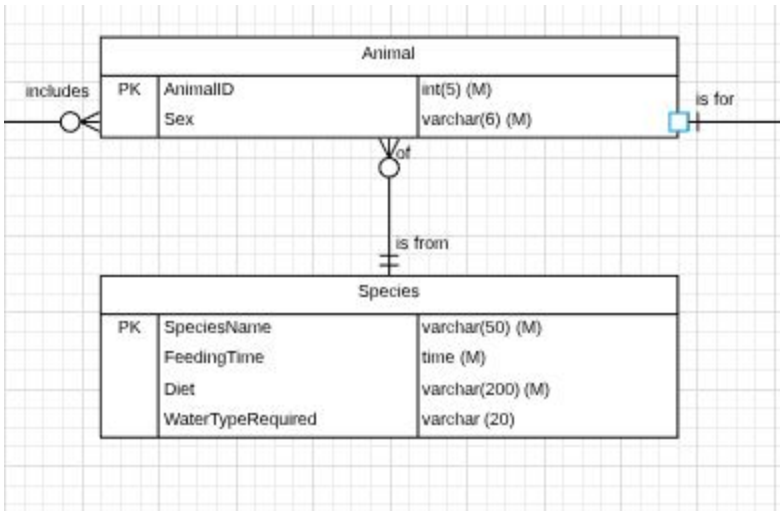
“Animal” entity before normalization:



“Species” and “Animal” dependency after normalization:



“Animal” and “Species” entities after normalization:



All entities are in BCNF after normalization of “Animal”.