CPSC 4620 – Project Step 1

Entity-Relationship Diagram
Due: Tuesday, May 28th at 11:00 am
100 pts

The database system you are creating will be used by Anton's Pizzeria to track the day to day operations of their pizzeria. For this assignment you will use the following prompt to create the conceptual model of this mini-world. You will use an Entity-Relationship diagram to represent that conceptual model, and you will submit the ER-diagram for this assignment. You will need to use the EER notation from chapter 4 to complete this design.

The Mini-world:

The most obvious thing that needs to be tracked as part of this database system is the information about each Pizza. A pizza has a crust type (thin, original, pan, gluten free), a size (personal, medium, large, X-Large). A pizza has an associated price and cost to the company, both of which are determined by the size of the pizza and the toppings on the pizza. A pizza can also be completed by the kitchen, or still being prepped by the kitchen. Each pizza should have a timestamp for when the pizza was ordered (so the kitchen can prioritize orders). Each pizza can have multiple toppings. Each topping has a name, a price to the customer, a price to the business, an amount used for each pizza size, and a current inventory level, which is updated whenever a pizza is ordered. The same topping can be on many pizzas (ex, several pizzas have pepperoni on them). A customer can request extra of something, which would be a double amount. Cheese counts as a toping.

Pizzas belong to orders. An order can be for dine in, or for pickup, or delivery. An order can have multiple pizzas on it. Each order has a total cost to the business, which is calculated by adding up the costs of each pizza. Each order also has a total price to the customer, which is calculated by adding the prices of each pizza. If an order is for a dine in customer, then we need to know the table number, and the seat number(s) for the order. Seat numbers allow us to have multiple people at a table who are paying separately. So table 14 could have 4 people at it, seats 1 and 2 are on one order, and seats 3 and 4 are each on separate orders. In this example that would be 3 "customers" one with seats 1 and 2, one with seat 3 and one with seat 4. If an order is for pickup, then it needs to have a pickup customer associated with it. That customer must have a name and a phone number they can be reached at. If an order is for delivery, then it must have a delivery customer associated with it with a name, phone number and address. A customer can have many orders, since the information is saved for the next time they order pizza. A customer could have some pickup orders, and some delivery orders.

Furthermore, Anton's Pizzeria offers discounts. Discounts can be applied to individual pizzas or an entire order. Discounts have a name and either a dollar amount off or a percentage off. A pizza or order can have multiple discounts applied to it, and a discount can be applied to many pizzas or orders.

The pizzeria also needs to track some base prices for their pizzas. A Base price would have a price, a crust type, and a size, and a base cost for the same crust and size. To find the price of a pizza, you would look at the size and crust of the pizza, and find the corresponding base price. Then to that you would add the price for each topping on the pizza. Then you would apply any discounts to the pizza. To find the total for the order, you would add up the price for each pizza, then apply any discounts that apply to the order. While the base prices or topping prices could change over time, those changes should not be reflected in past orders. So a pizza's price should be calculated once and saved. To find

the cost of a pizza to the business, the same process is used, just with costs instead of prices. Discounts do not lower the cost of the order to a business.

Notes:

Nowhere in this prompt does it mention a unique ID for any of these entities. This is because your customer is unfamiliar with databases and does not know that primary keys are important. Feel free to add an ID field to any entities to avoid a complicated web of weak entities and identifying relationships. I highly recommend you do this. When we learn how to convert these diagrams into an actual schema, you will see that it makes a meaningless difference to our final database.

Given your client's lack of knowledge about databases, there may be other things you need to interpret as well. For instance, from your client's viewpoint the distinction between a customer and an order can be fuzzy. For each attribute carefully consider whether that is information about the order or about the customer. Your client may also provide extra information that may not be directly shown in the ER diagram (like some of the details about how pricing is determined) but will give you an idea of how the information will be used. Feel free to ask follow up questions if something is unclear.

You will need to use the EER notation introduced in Chapter 4.

Groups:

You may work as an individual, or work with one partner for this project. I encourage you to work with a partner. Please note that once you have selected a partner, you are only allowed to work with that partner for the rest of the semester long project. If you work with someone and decide you do not want to work with them on a later stage, you will have to work alone. So pick your partner carefully. If you work with a partner, actually work with them. Divide and conquer will not work well for this assignment. Actually discuss and work on the diagram together. You could each try it individually, and then get together to compare and combine the designs, but either way you will still need to actually work together on the assignment.

You may only work with one partner. Any larger groups would be violating the academic integrity rules for this class. Any groups that work together would also violate the academic integrity rules. For this assignment, there is not much that can be discussed without violating academic integrity, so it is best to not discuss it with anyone outside of your group. If working with a partner, make sure you only submit one copy that has both partner's names on it.

Submission:

You will submit an electronic copy of your assignment on Canvas by the due date. No late assignments will be accepted. You must use a diagramming tool to create your diagrams (such as draw.io). Do not submit the draw.io save file. It has an option to export to a jpeg file. Hand drawn diagrams, even if scanned in, will not be accepted. If you find another diagramming tool, make sure you follow the notation used in this course. There are alternative notation styles out there that other tools may use for ER diagrams, but for this course we will just use the notation style introduced in class.