CSCI 688 Assignment 1 (ERM)

Create an ER Schema for the following scenario. The schema must include:

- The ER diagram itself, complete with attributes and cardinality constraints.
- An entity attribute list briefly describing, when necessary, the attributes for each entity. 
  Try to have at least 5 attributes per entity, although this will not be reasonable for some entities.
- A list of relationship attributes and their descriptions. (NOTE: NOT all relationships will have attributes.)
- A list of assumptions you have made in order to make the diagram.

Midwest Medical Nutrition is a company that specializes in food and meal preparation for the hospital industry. The company wants to create a database to help share and manage recipes used in meal preparation.

There are two main groups of users of the database: 1) Customers, and 2) Managers. The customers are the various hospital nutritionists, cooks, and food preparation people that will be using the recipes. Managers are employees of Midwest Medical Nutrition that will need to maintain certain aspects of the database. An important point is that managers are not database administrators.

Draw an ER model that most accurately and concisely represents the following scenario.

1. Recipes are composed of ingredients in specific quantities and instructions for preparing and combining the ingredients.
2. The quantities of each ingredient are often measured in different units. The unit used may depend on the recipe. For example, sugar can be measured in cups, tablespoons, teaspoons, ounces or pounds.
3. Ingredients often have descriptive adjectives associated with them. Carrots can be sliced, diced, or as individual carrots. The adjective may often affect the measurement unit used.
4. Conversions between ingredient measurements are extremely useful. For example, if a recipe calls for 200 cups of flour (the recipes are often made in large quantities) it is useful to know how many pounds of flour is equivalent.
5. Recipes can be placed in multiple categories.
6. Categories can be placed in categories. For example, a recipe can be placed in the category of “Mexican food”. Mexican food can be placed in the category of “Latin American cuisine”. Latin American cuisine can be placed in a category of “ethnic cuisine”.
7. Midwest Medical Nutrition will provide a collection of recipes and a categorization system to be shared between its customers.
8. Individual customers should be able to add their own recipes, which will not be shared between customers.
9. Customers should be able to add their own categories and place any recipe they have access to in these categories.
10. Additional categories added by a customer should not be visible to other customers.
11. Recipe ingredients have nutritional information associated with them. It is desirable to track calories, fat grams of various types of fat, and amounts of various vitamins and minerals.
12. Recipes should also state the number of expected servings.
13. Recipes should have a listed source, if one exists.
14. Recipes should have comments which can be added by the customers.
15. Comments added by customers to recipes not their own should not be visible by other customers.
16. Customers should be able to add, delete and modify recipes of their own.
17. Customers should be able to create categories for new recipes.
18. Customers should be able to assign any recipe to which they have access to any category, including categories they have not created.
19. Customers should be able to assign categories to categories for any categories they have created.
20. Customers should be able to search for recipes by ingredient. “What are the recipes that have anise in them?”
21. Customers should be able to scale a recipe by number of servings. “What is this recipe when I change the number of servings to 60?”
22. Customers should be able to scale a recipe by amount of any ingredient. “What is this recipe for 5 cans of tomato sauce instead of 3?”
23. Customers should be able to search for recipes by nutritional requirements. “What are the recipes that have more than 5mg Vitamin A per serving?”
24. Customers should be able to add / delete / modify comments on any of the recipes to which they have access.
25. Managers should be able to do anything that customers can do.
26. Managers can add / delete / modify customers.
27. Managers can change the access permissions on recipes. E.g., if someone has a fantastic recipe for chicken cordon bleu, then the manager can make it accessible to everyone.
28. Managers maintain the nutritional information of ingredients.
29. Managers maintain the conversion factors between different measurement systems, e.g., “There are 20 cups of sugar in 5 lbs.”

Hints: If you blindly take the above sentences and turn nouns into entities, verbs into relationships, and adjectives into attributes, you will likely do very poorly. Think about the data and how it interacts.

Try different alternatives. Some things will work better than others.

Not every piece of data or interaction is listed.