In 2020, via a quick scanner and proper kitchen design, we can track exactly which food stuffs are in our cupboards and refrigerator. Of course we are not always certain in which amounts these items are present; we know there is a milk carton in the refrigerator, but perhaps not that there is exactly 623 ml of milk. In addition to information about what food we have, we have a database of recipes. Each recipe has a name, type, text description and most importantly a list of necessary ingredients in various quantities.

Given this set-up we want to support several practical operations. Aside from being able to add to, delete from and list the food items (including exact quantities if known) in the kitchen, we would like to know which recipes can definitely be made and which can possibly be made? For those that may be possibly made, it is necessary to generate a set of conditions to report that help the user to determine quickly if they have enough supplies (e.g. "check to insure that you have 9 lasagna noodles in the box"). Another, related capability is to let the user select a set of recipes and, from this, a custom shopping list should be generated; the shopping list should be the minimal set of items necessary to achieve all the chosen recipes. Finally a user should be able to register that they have performed a recipe and thus update the contents of their fridge and cupboards accordingly.

1. Draw an entity-relationship diagram for your database.

2. Design and implement a database schema reflecting your conceptual model.

3. Build a GUI or command-line interface (in language of your choice) to support above operations.

Demonstration scenario

Populate the database with at least the three following recipes:

Mexican Fried Rice: 300g long grain rice, 30ml olive oil, 1 red chili pepper, 2 tomato, 1 onion, 2 cloves garlic.

Mushroom Quesadillas: 20ml olive oil, 200g champion mushrooms, 1 tomato, 2 tortillas, 20 g basil, 1 green bell pepper, 100g taco cheese.

Broccoli Stir Fry: 1 onion, 300g broccoli, 40ml olive oil, 30ml sesame oil, 20ml soy sauce, 50 g brown sugar, 200g long grain rice.

Kitchen: 400g long grain rice, 2 tomato, 3 onion, 7 cloves garlic, 3 red chili pepper, 700g broccoli, 400ml olive oil, 50g basil, bottle of sesame oil (unknown amount), brown sugar (unknown amount), bottle of soy sauce (unknown amount).

Show which recipes can definitely and possibly be performed. If we want to fix one of each recipe what additional food stuffs and in what quantities must we buy. If we fix Mexican Fried Rice, how does this change the state of the kitchen. Then let us add/delete some items and test if the system is actually working correctly. The natural language of your system may be either Swedish or English.