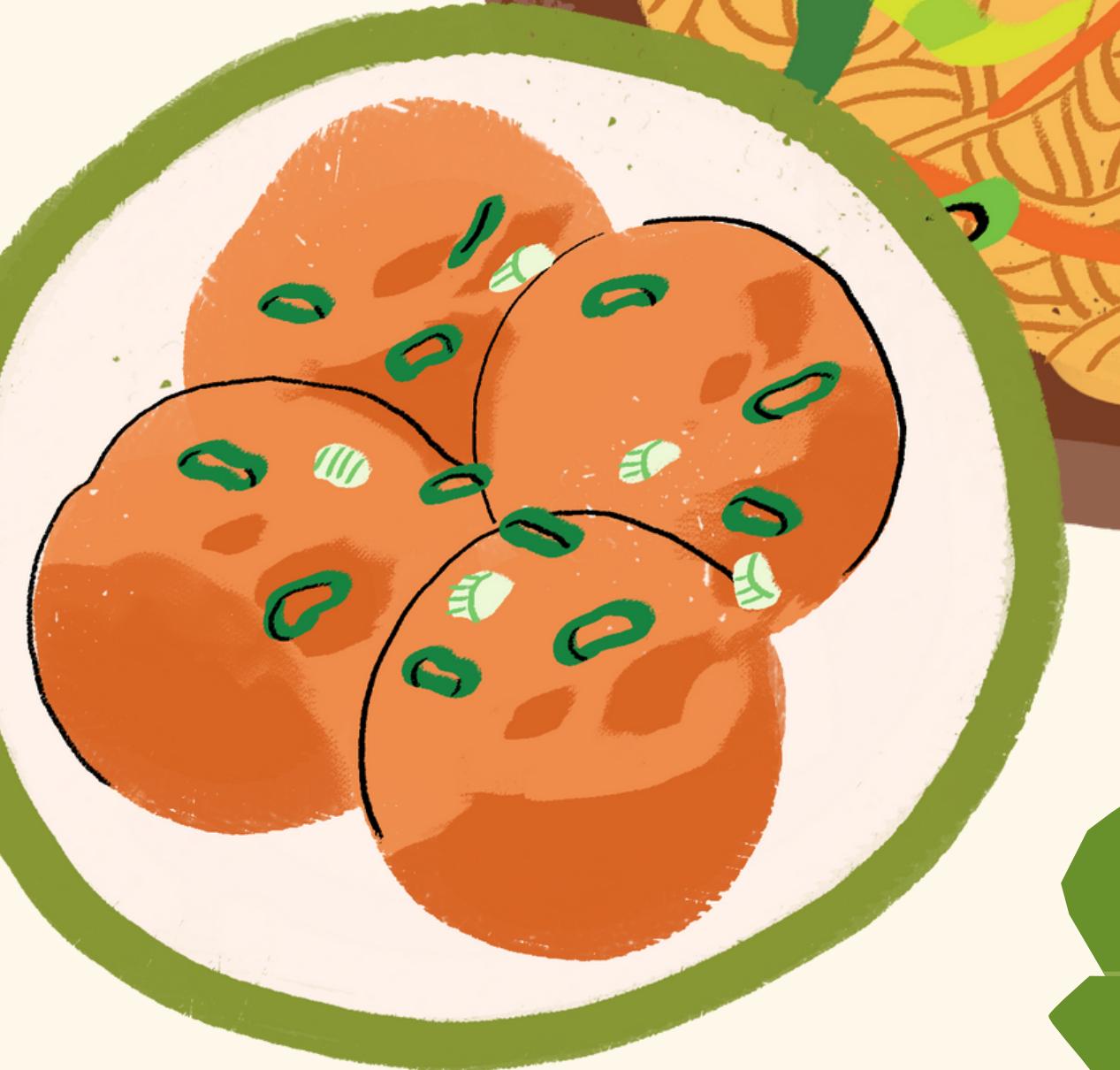


COOKING RECIPES

Data Base



SCENARio

Imagine you're developing a digital culinary community where users can explore, share, and organize their favorite recipes. The platform aims to connect food enthusiasts, whether they are home cooks or professional chefs, in a vibrant online environment.

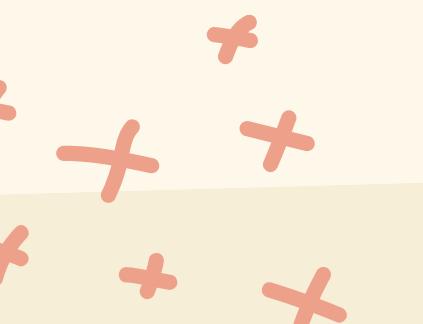
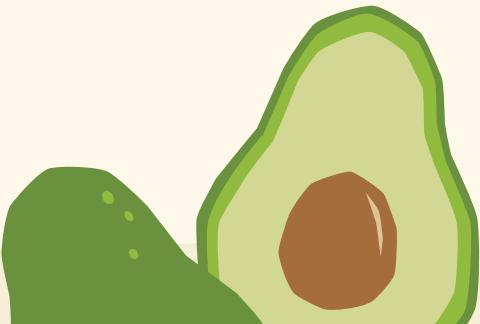


PHASE 1

Business Rule

Chen's Notation

UML Notation



BUSINESS RULE

Each User has its UserID, UserName, Email, RegistrationDate, LastLoginDate.

Each entry in the "Users" table (one user) can be associated with multiple entries in the "Recipes" table (many recipes). However, each many recipe is created by one specific user. Each entry in the 'User' table (one user) can be associated with multiple entries in the 'Review' table (many reviews). However, every single user has multiple reviews.

Each Steps has its StepsID, RecipeID, Description, duration, OrderNumber, ToolsRequired.

Each entry in the 'Steps' table (many steps) with one entry in the table of 'Recipes' (one recipe), yet each recipe has multiple steps.

Each Ingredients has its IngredientID, Name, Allergens, SpiceLevel, CaloriesPerServing.

Each entry in the 'Ingredients' table (many ingredients) with one entry in the table of 'Recipes' (one recipe) Each recipe has multiple ingredients.

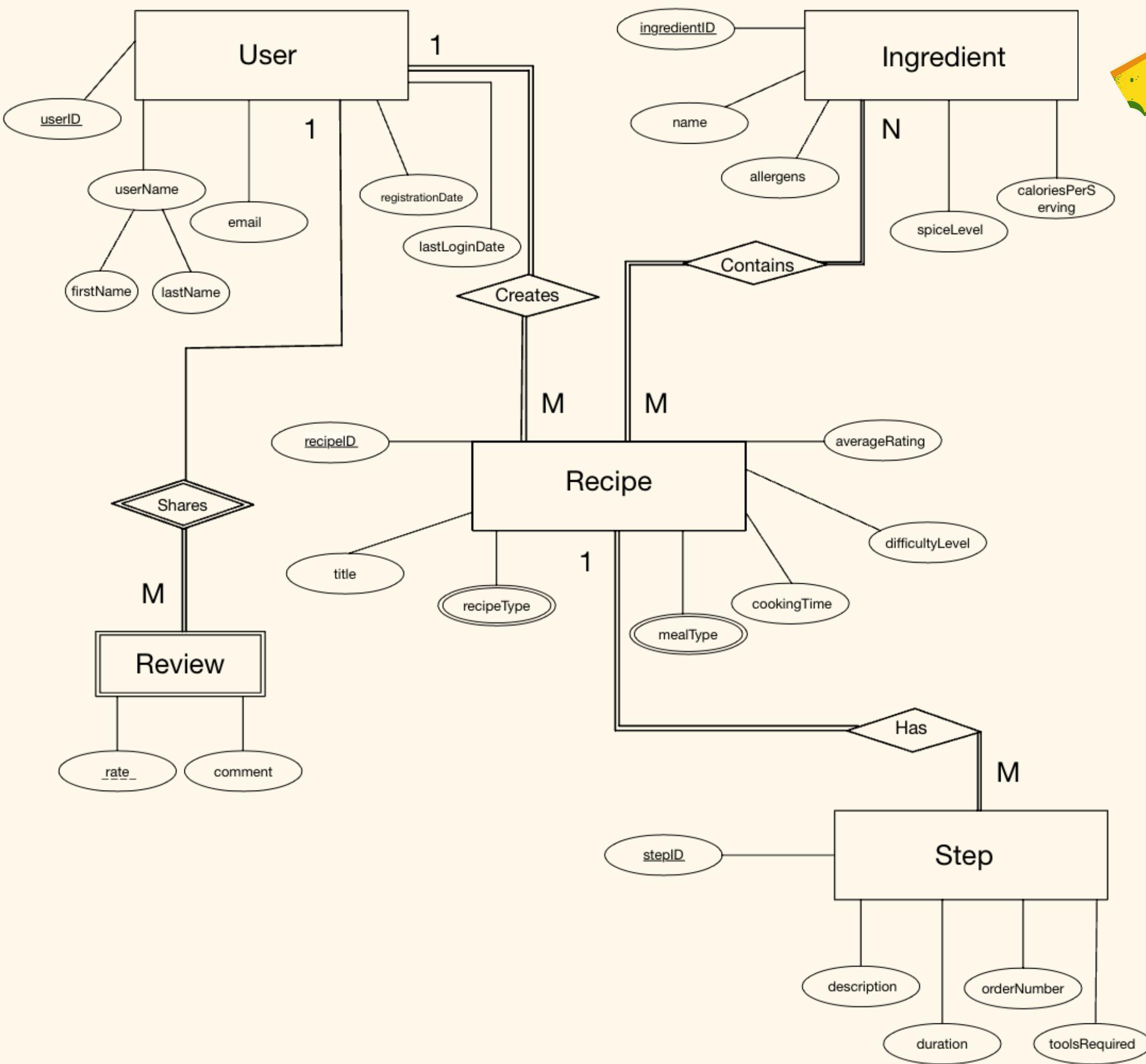
Each Recipes has its RecipeID, Title, RecipeType, MealType, CookingTime, DifficultyLevel, AverageRating.

Each entry in the 'Recipes' table (one recipe) with one entry in the table 'Users' (one user) the only recipe is from one user. Each entry in the 'Recipes' table (one recipe) can be associated with multiple entries in the 'Steps' table (many steps). However, every single recipe has multiple steps. Each entry in the 'Recipes' table (one recipe) can be associated with multiple entries in the 'Ingredients' table (many ingredients). However, every single recipe has multiple ingredients.

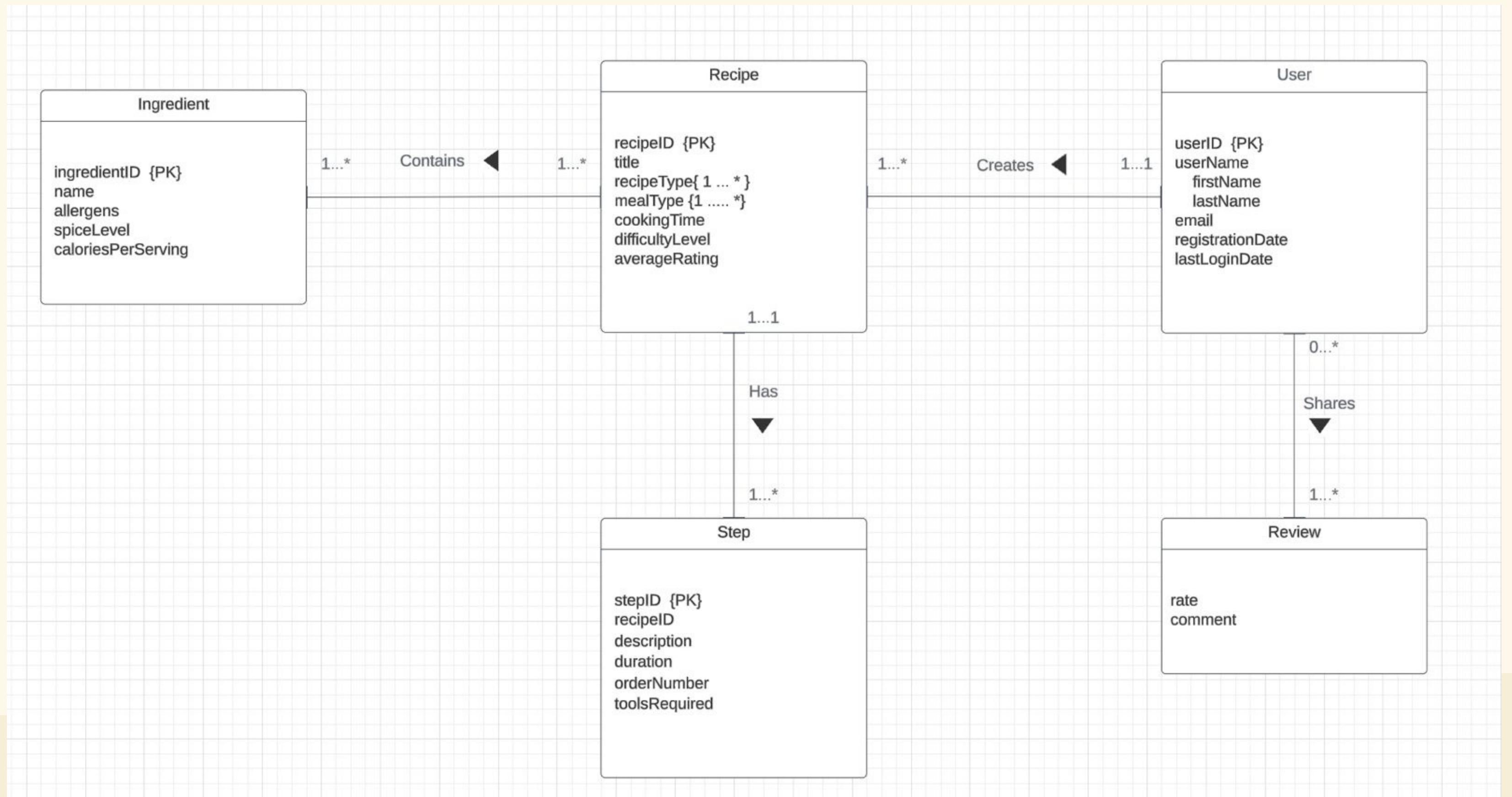
Each 'Review' has its own rating and comment.

Each entry in the Review table (multiple reviews) can be linked to individual entries in the User table (single user). However, many reviews are created by one specific user.

CHEN'S NOTATION



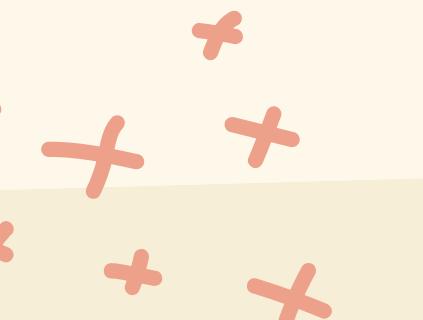
UML NOTATION



PHASE 2

Mapping of ER into
Relational Schema

Normalization



MAPPING OF ER INTO RELATIONAL SCHEMA



Step 1: Mapping of Regular Entity Types

User

| | | | | | |
|---------------|-----------|----------|-------|------------------|---------------|
| <u>userID</u> | firstName | lastName | email | registrationDate | lastLoginDate |
|---------------|-----------|----------|-------|------------------|---------------|

Ingredient

| | | | | |
|---------------------|------|-----------|------------|---------------|
| <u>ingredientID</u> | name | allergens | spiceLevel | averageRating |
|---------------------|------|-----------|------------|---------------|

Recipe

| | | | | |
|-----------------|-------|-------------|-----------------|---------------|
| <u>recipeID</u> | title | cookingTime | difficultyLevel | averageRating |
|-----------------|-------|-------------|-----------------|---------------|

Step

| | | | | |
|---------------|-------------|----------|-------------|---------------|
| <u>stepID</u> | description | duration | orderNumber | toolsRequired |
|---------------|-------------|----------|-------------|---------------|

Step 2: Mapping of Weak Entity Types

Review

| | | |
|---------------|-------------|---------|
| <u>userID</u> | <u>rate</u> | comment |
|---------------|-------------|---------|



Step 3: Mapping of Binary 1:1 Relationship Types

None relationship

Step 4: Mapping of Binary 1:N Relationship Types

Creates

User

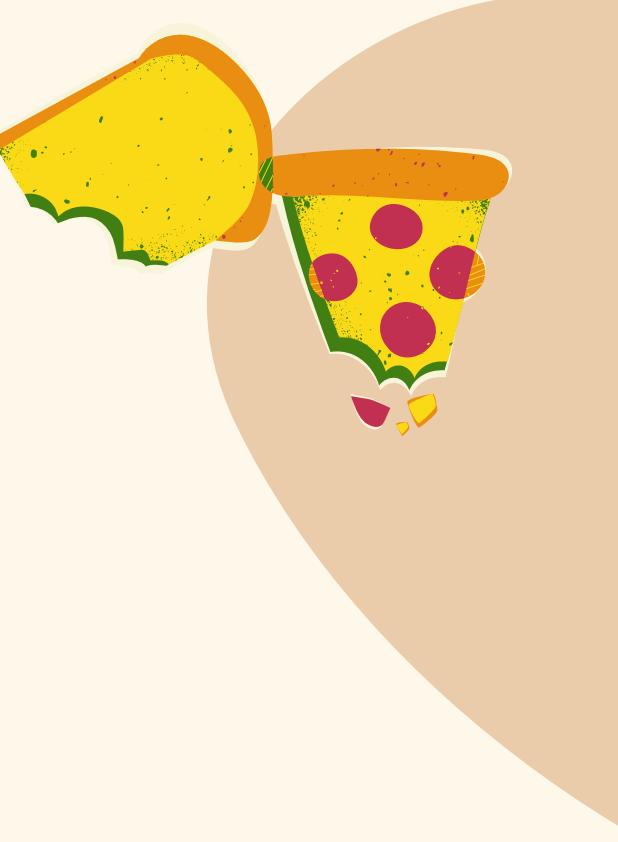
| | | | | | |
|---------------|-----------|----------|-------|------------------|---------------|
| <u>userID</u> | firstName | lastName | email | registrationDate | lastLoginDate |
|---------------|-----------|----------|-------|------------------|---------------|



Recipe

| | | | | | |
|-----------------|-------|-------------|-----------------|---------------|---------------|
| <u>recipeID</u> | title | cookingTime | difficultyLevel | averageRating | <u>userID</u> |
|-----------------|-------|-------------|-----------------|---------------|---------------|





Has

Recipe

| | | | | | |
|-----------------|-------|-------------|-----------------|---------------|--------|
| <u>recipeID</u> | title | cookingTime | difficultyLevel | averageRating | userID |
|-----------------|-------|-------------|-----------------|---------------|--------|

Step

| | | | | | |
|---------------|-------------|----------|-------------|---------------|----------|
| <u>stepID</u> | description | duration | orderNumber | toolsRequired | recipeID |
|---------------|-------------|----------|-------------|---------------|----------|

Shares

User

| | | | | | |
|---------------|-----------|----------|-------|------------------|---------------|
| <u>userID</u> | firstName | lastName | email | registrationDate | lastLoginDate |
|---------------|-----------|----------|-------|------------------|---------------|

Review

| | | |
|---------------|-------------|---------|
| <u>userID</u> | <u>rate</u> | comment |
|---------------|-------------|---------|



Step 5: Mapping of Binary M:N Relationship Types

Ingredient

| | | | | |
|---------------------|------|-----------|------------|---------------|
| <u>ingredientID</u> | name | allergens | spiceLevel | averageRating |
|---------------------|------|-----------|------------|---------------|

Recipe

| | | | | | |
|-----------------|-------|-------------|-----------------|---------------|--------|
| <u>recipeID</u> | title | cookingTime | difficultyLevel | averageRating | userID |
|-----------------|-------|-------------|-----------------|---------------|--------|

Contains

| | |
|---------------------|-----------------|
| <u>ingredientID</u> | <u>recipeID</u> |
|---------------------|-----------------|

Step 6: Mapping of Multivalued Attributes

Recipe

| | | | | | |
|-----------------|-------|-------------|-----------------|---------------|--------|
| <u>recipeID</u> | title | cookingTime | difficultyLevel | averageRating | userID |
|-----------------|-------|-------------|-----------------|---------------|--------|

RecipeType

| | |
|-----------------|-------------------|
| <u>recipeID</u> | <u>recipeType</u> |
|-----------------|-------------------|

MealType

| | |
|-----------------|-----------------|
| <u>recipeID</u> | <u>mealType</u> |
|-----------------|-----------------|

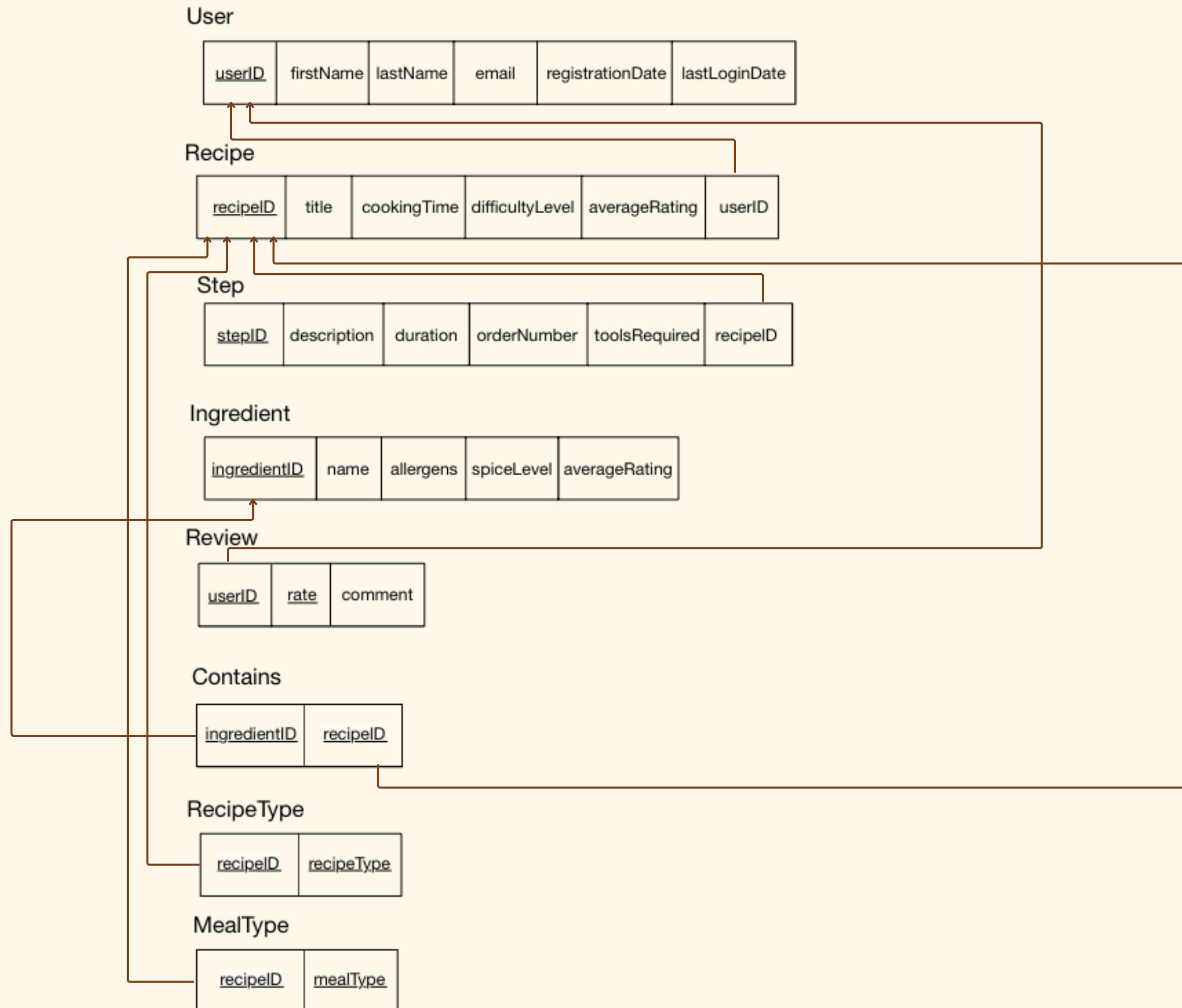
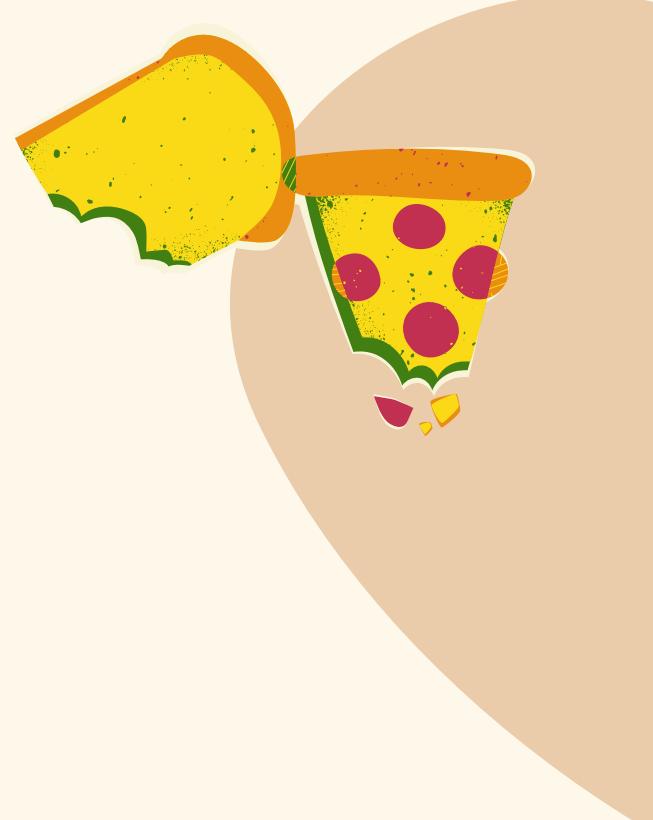


Step 7: Mapping of N-ary Relationship

None relationship



FINAL MAPPING



NORMALIZATION

User

| | | | | | |
|---------------|-----------|----------|-------|------------------|---------------|
| <u>userID</u> | firstName | lastName | email | registrationDate | lastLoginDate |
|---------------|-----------|----------|-------|------------------|---------------|

The table in the first normal form(1NF): there is No Multivalued Attributes.
The table in the second normal form(2NF): there is No Partial Dependency.
The table in the third normal form(3NF): there is No Transitive Dependency.

Recipe

| | | | | | |
|-----------------|-------|-------------|-----------------|---------------|--------|
| <u>recipeID</u> | title | cookingTime | difficultyLevel | averageRating | userID |
|-----------------|-------|-------------|-----------------|---------------|--------|

The table in the first normal form(1NF): there is No Multivalued Attributes.
The table in the second normal form(2NF): there is No Partial Dependency.
The table in the third normal form(3NF): there is No Transitive Dependency.

Step

| | | | | | |
|---------------|-------------|----------|-------------|---------------|----------|
| <u>stepID</u> | description | duration | orderNumber | toolsRequired | recipeID |
|---------------|-------------|----------|-------------|---------------|----------|

The table in the first normal form(1NF): there is No Multivalued Attributes.
The table in the second normal form(2NF): there is No Partial Dependency.
The table in the third normal form(3NF): there is No Transitive Dependency.

Ingredient

| <u>ingredientID</u> | name | allergens | spiceLevel | averageRating |
|---------------------|------|-----------|------------|---------------|
|---------------------|------|-----------|------------|---------------|

The table in the first normal form(1NF): there is No Multivalued Attributes.
The table in the second normal form(2NF): there is No Partial Dependency.
The table in the third normal form(3NF): there is No Transitive Dependency.

Review

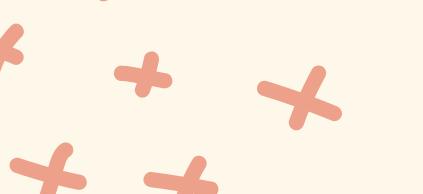
| <u>userID</u> | <u>rate</u> | comment |
|---------------|-------------|---------|
|---------------|-------------|---------|

The table in the first normal form(1NF): there is No Multivalued Attributes.
The table in the second normal form(2NF): there is No Partial Dependency.
The table in the third normal form(3NF): there is No Transitive Dependency.

Contains

| <u>ingredientID</u> | <u>recipeID</u> |
|---------------------|-----------------|
|---------------------|-----------------|

The table in the first normal form(1NF): there is No Multivalued Attributes.
The table in the second normal form(2NF): there is No Partial Dependency.
The table in the third normal form(3NF): there is No Transitive Dependency.





RecipeType

| <u>recipeID</u> | <u>recipeType</u> |
|-----------------|-------------------|
| | |

The table in the first normal form(1NF): there is No Multivalued Attributes.

The table in the second normal form(2NF): there is No Partial Dependency.

The table in the third normal form(3NF): there is No Transitive Dependency.

MealType

| <u>recipeID</u> | <u>mealType</u> |
|-----------------|-----------------|
| | |

The table in the first normal form(1NF): there is No Multivalued Attributes.

The table in the second normal form(2NF): there is No Partial Dependency.

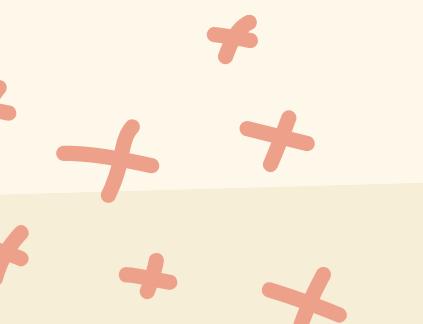
The table in the third normal form(3NF): there is No Transitive Dependency.

PHASE 3

SQL definition
commands

SQL data
manipulation
commands

SQL Queries using
SELECT command



SQL DEFINITION COMMANDS



- Create Schema and Table

```
• CREATE DATABASE CR;

• USE CR;

• CREATE TABLE Users (
    userID INT PRIMARY KEY,
    firstName VARCHAR(50),
    lastName VARCHAR(50),
    email VARCHAR(100),
    registrationData DATE,
    lastLoginData DATE
);

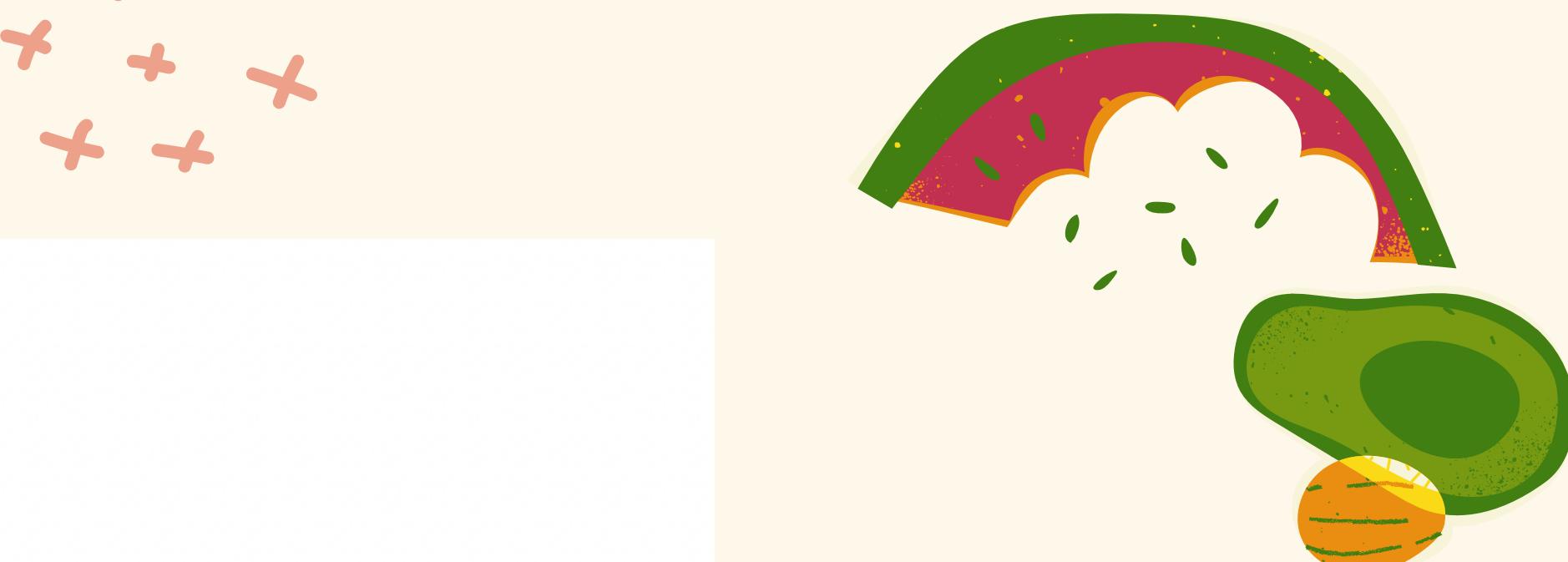
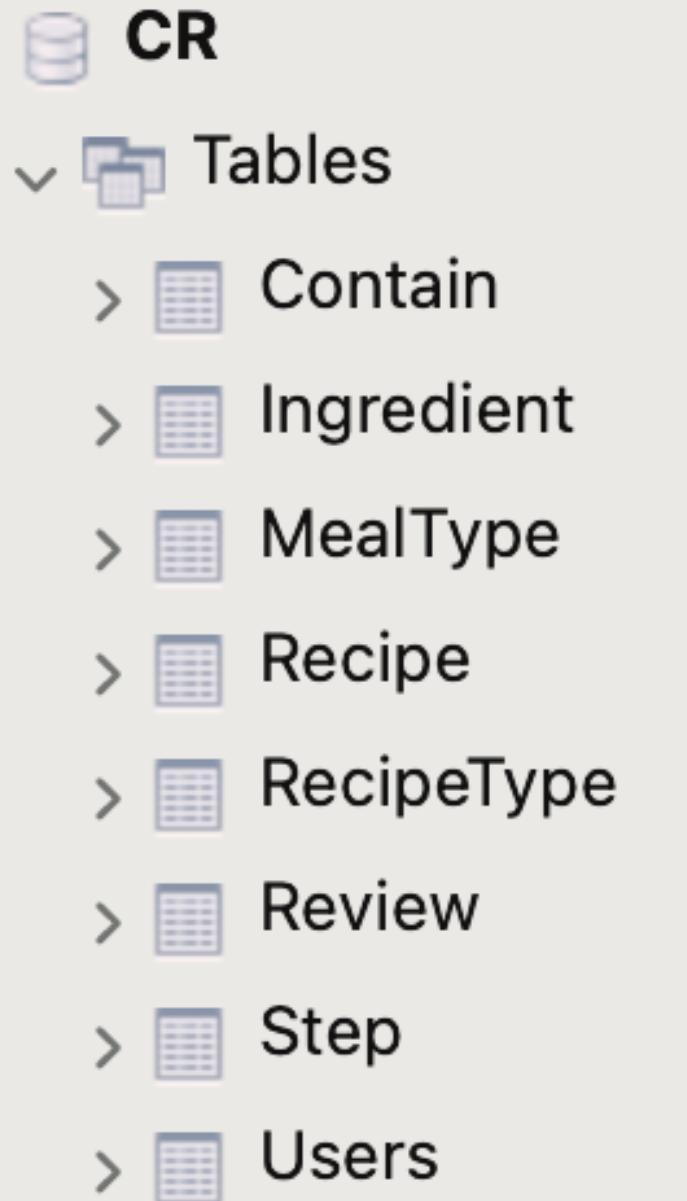
• CREATE TABLE Recipe (
    recipeID INT PRIMARY KEY,
    title VARCHAR(100),
    cookingTime INT,
    difficultyLevel VARCHAR(50),
    averageRating DECIMAL(3, 2),
    userID INT,
    FOREIGN KEY (userID) REFERENCES Users(userID)
);

• CREATE TABLE Step (
    stepID INT PRIMARY KEY,
    description VARCHAR(10000),
    duration INT,
    orderNumber INT,
    toolsRequired VARCHAR(200),
    recipeID INT,
    FOREIGN KEY (recipeID) REFERENCES Recipe(recipeID)
);

• CREATE TABLE Ingredient (
    ingredientID INT PRIMARY KEY,
    name VARCHAR(100),
    allergens VARCHAR(200),
    spiceLevel VARCHAR(50),
    averageRating DECIMAL(3, 2)
);

• CREATE TABLE Review (
    userID INT,
    rate INT,
    comment VARCHAR(200),
    PRIMARY KEY (userID, rate),
    FOREIGN KEY (userID) REFERENCES Users(userID)
);
```

- ```
CREATE TABLE Contain (
 ingredientID INT,
 recipeID INT,
 PRIMARY KEY (ingredientID, recipeID),
 FOREIGN KEY (ingredientID) REFERENCES Ingredient(ingredientID),
 FOREIGN KEY (recipeID) REFERENCES Recipe(recipeID)
);
```
- ```
CREATE TABLE RecipeType (
    recipeID INT,
    RecipeType VARCHAR(50),
    PRIMARY KEY (recipeID, RecipeType),
    FOREIGN KEY (recipeID) REFERENCES Recipe(recipeID)
);
```
- ```
CREATE TABLE MealType (
 recipeID INT,
 MealType VARCHAR(50),
 PRIMARY KEY (recipeID, MealType),
 FOREIGN KEY (recipeID) REFERENCES Recipe(recipeID)
);
```



# SQL DATA MANIPULATION COMMANDS



## • Insert data into the Tables

- `INSERT INTO CR.Users (userID, firstName, lastName, email, registrationData, lastLoginData)`  
`VALUES`

```
(89, 'Ghala', 'AlQarni', 'Ghala121@gmail.com', '2022-01-01', '2022-01-05'),
(245, 'Aya', 'Babkoor', 'AyaBab98@gmail.com', '2022-02-10', '2022-02-12'),
(3, 'Rema', 'AlGhamdi', 'RemaAl67@gmail.com', '2022-03-15', '2022-03-16'),
(44, 'Sara', 'Mohammed', 'Sara1125@gmail.com', '2022-04-20', '2022-04-22'),
(593, 'Rana', 'Abdullah', 'RanaAbd0@gmail.com', '2022-05-25', '2022-05-27');
```

| userID | firstName | lastName | email              | registrationD... | lastLoginData |
|--------|-----------|----------|--------------------|------------------|---------------|
| 3      | Rema      | AlGhamdi | RemaAl67@gmail.com | 2022-03-15       | 2022-03-16    |
| 44     | Sara      | Mohammed | Sara1125@gmail.com | 2022-04-20       | 2022-04-22    |
| 89     | Ghala     | AlQarni  | Ghala121@gmail.com | 2022-01-01       | 2022-01-05    |
| 245    | Aya       | Babkoor  | AyaBab98@gmail.com | 2022-02-10       | 2022-02-12    |
| 593    | Rana      | Abdullah | RanaAbd0@gmail.com | 2022-05-25       | 2022-05-27    |

- `INSERT INTO CR.Recipe (recipeID, title, cookingTime, difficultyLevel, averageRating, userID)`  
`VALUES`

```
(263, 'Pasta Carbonara', 30, 'Easy', 4.5, 593),
(200, 'Chicken Parmesan', 45, 'Medium', 4.2, 593),
(5112, 'Fried Eggs', 10, 'Easy', 4.8, 3),
(489, 'Chocolate Cake', 60, 'Difficult', 4.7, 44),
(537, 'Vegetable Curry', 40, 'Medium', 4.3, 89),
(509, 'kabsa', 60, 'Medium', 5, 89);
```

| recipeID | title            | cookingTi... | difficultyLe... | averageRating | userID |
|----------|------------------|--------------|-----------------|---------------|--------|
| 200      | Chicken Parmesan | 45           | Medium          | 4.20          | 593    |
| 263      | Pasta Carbonara  | 30           | Easy            | 4.50          | 593    |
| 489      | Chocolate Cake   | 60           | Difficult       | 4.70          | 44     |
| 509      | kabsa            | 60           | Medium          | 5.00          | 89     |
| 537      | Vegetable Curry  | 40           | Medium          | 4.30          | 89     |
| 5112     | Fried Eggs       | 10           | Easy            | 4.80          | 3      |



```

INSERT INTO CR.Step (stepID, description, duration, orderNumber, toolsRequired, recipeID)
VALUES
(1, 'Boil water then cook the pasta for 15 min then mix it with the sauce.', 10, 1, 'Pot, strainer, plane, mixing spoon', 263),
(2, 'Fry bacon and garlic in a pan with Coconut Oil for half an hour .', 5, 40, 'Pan, spatula', 200),
(3, 'Hatch the eggs and mix them in a bowl, then put a frying pan on the fire with a little oil and put the eggs with them', 3, 3, 'Bowl, Pan', 5112),
(4, 'Mix flour, sugar, baking powder and vanilla in a dish, and water, oil and milk in a dish, then mix them all, then put them in the oven , then serve them with chocolate sauce..', 10, 1, 'plane, mixing spoon', 489),
(5, 'Sauté onions, garlic, and ginger in oil, add spices, stir, then add chopped vegetables and simmer in coconut milk or tomato puree until tender.', 15, 2, 'Pan, tongs', 537),
(7, 'onions, garlic, and ginger in oil, add kabsa spice mix, stir, then add meat (usually chicken or lamb) and rice, simmer with water or broth until rice is cooked and meat is tender.', 15, 2, 'Pan, tongs', 509);

```

| stepID | description                                           | duration | orderNumber | toolsRequired                      | recipeID |
|--------|-------------------------------------------------------|----------|-------------|------------------------------------|----------|
| 1      | Boil water then cook the pasta for 15 min then...     | 10       | 1           | Pot, strainer, plane, mixing spoon | 263      |
| 2      | Fry bacon and garlic in a pan with Coconut Oil f...   | 5        | 40          | Pan, spatula                       | 200      |
| 3      | Hatch the eggs and mix them in a bowl, then pu...     | 3        | 3           | Bowl, Pan                          | 5112     |
| 4      | Mix flour, sugar, baking powder and vanilla in a...   | 10       | 1           | plane, mixing spoon                | 489      |
| 5      | Sauté onions, garlic, and ginger in oil, add spice... | 15       | 2           | Pan, tongs                         | 537      |
| 7      | onions, garlic, and ginger in oil, add kabsa spice... | 15       | 2           | Pan, tongs                         | 509      |

-- Ingredient table content

- INSERT INTO CR.Ingredient (ingredientID, name, allergens, spiceLevel, averageRating)

VALUES

```

(1, 'Pasta', 'Gluten', NULL, NULL),
(2, 'Bacon', NULL, NULL, NULL),
(3, 'Eggs', NULL, NULL, NULL),
(4, 'Flour', 'Gluten', NULL, NULL),
(5, 'Sugar', NULL, NULL, NULL),
(6, 'Baking Powder', NULL, NULL, NULL),
(7, 'Vanilla', NULL, NULL, NULL),
(8, 'Chicken', NULL, NULL, NULL),
(9, 'Lamb', NULL, NULL, NULL),
(10, 'Rice', NULL, NULL, NULL);

```

| ingredientID | name          | allergens | spiceLevel | averageRating |
|--------------|---------------|-----------|------------|---------------|
| 1            | Pasta         | Gluten    | NULL       | NULL          |
| 2            | Bacon         | NULL      | NULL       | NULL          |
| 3            | Eggs          | NULL      | NULL       | NULL          |
| 4            | Flour         | Gluten    | NULL       | NULL          |
| 5            | Sugar         | NULL      | NULL       | NULL          |
| 6            | Baking Powder | NULL      | NULL       | NULL          |
| 7            | Vanilla       | NULL      | NULL       | NULL          |
| 8            | Chicken       | NULL      | NULL       | NULL          |
| 9            | Lamb          | NULL      | NULL       | NULL          |
| 10           | Rice          | NULL      | NULL       | NULL          |



```
-- Review table content (example reviews)
• INSERT INTO CR.Review (userID, rate, comment)
VALUES
 (89, 4, 'Delicious! Will make again.'),
 (245, 5, 'Perfect recipe, loved it!'),
 (3, 4, 'Quick and easy, great for breakfast.'),
 (44, 4, 'Moist and rich, loved the chocolate flavor.'),
 (593, 5, 'Fantastic dish, everyone enjoyed it.');
```

| userID | rate | comment                                     |
|--------|------|---------------------------------------------|
| 3      | 4    | Quick and easy, great for breakfast.        |
| 44     | 4    | Moist and rich, loved the chocolate flavor. |
| 89     | 4    | Delicious! Will make again.                 |
| 245    | 5    | Perfect recipe, loved it!                   |
| 593    | 5    | Fantastic dish, everyone enjoyed it.        |

```
-- Contain table content
• INSERT INTO CR.Contain (ingredientID, recipeID)
VALUES
 (1, 263), -- Pasta Carbonara
 (2, 200), -- Chicken Parmesan
 (3, 5112), -- Fried Eggs
 (4, 489), -- Chocolate Cake
 (5, 489), -- Chocolate Cake
 (6, 489), -- Chocolate Cake
 (7, 489), -- Chocolate Cake
 (8, 509), -- Kabsa (Chicken)
 (10, 509); -- Kabsa (Rice)
```

| ingredientID | recipeID |
|--------------|----------|
| 2            | 200      |
| 1            | 263      |
| 4            | 489      |
| 5            | 489      |
| 6            | 489      |
| 7            | 489      |
| 8            | 509      |
| 10           | 509      |
| 3            | 5112     |



-- RecipeType table content

- **INSERT INTO** CR.RecipeType (recipeID, RecipeType)  
**VALUES**  
(263, 'Pasta'),  
(200, 'Chicken'),  
(5112, 'Eggs'),  
(489, 'Dessert'),  
(537, 'Vegetarian'),  
(509, 'Main Dish');

| recipeID | RecipeType |
|----------|------------|
| 200      | Chicken    |
| 263      | Pasta      |
| 489      | Dessert    |
| 509      | Main Dish  |
| 537      | Vegetarian |
| 5112     | Eggs       |

-- MealType table content

- **INSERT INTO** CR.MealType (recipeID, MealType)  
**VALUES**  
(263, 'Lunch'),  
(200, 'Dinner'),  
(5112, 'Breakfast'),  
(489, 'Dessert'),  
(537, 'Dinner'),  
(509, 'Dinner');

| recipeID | MealType  |
|----------|-----------|
| 200      | Dinner    |
| 263      | Lunch     |
| 489      | Dessert   |
| 509      | Dinner    |
| 537      | Dinner    |
| 5112     | Breakfast |

## • UPDATE data in a Table

**Update User's Last Login Date :**

- **UPDATE CR.Users**

```
SET lastLoginData = '2022-02-01'
WHERE userID = 89;
```

**After**

| userID | firstName | lastName | email              | registrationD... | lastLoginData |
|--------|-----------|----------|--------------------|------------------|---------------|
| 3      | Rema      | AlGhamdi | RemaAl67@gmail.com | 2022-03-15       | 2022-03-16    |
| 44     | Sara      | Mohammed | Sara1125@gmail.com | 2022-04-20       | 2022-04-22    |
| 89     | Ghala     | AlQarni  | Ghala121@gmail.com | 2022-01-01       | 2022-01-05    |
| 245    | Aya       | Babkoor  | AyaBab98@gmail.com | 2022-02-10       | 2022-02-12    |
| 593    | Rana      | Abdullah | RanaAbd0@gmail.com | 2022-05-25       | 2022-05-27    |

**Before**

| userID | firstName | lastName | email              | registrationD... | lastLoginData |
|--------|-----------|----------|--------------------|------------------|---------------|
| 3      | Rema      | AlGhamdi | RemaAl67@gmail.com | 2022-03-15       | 2022-03-16    |
| 44     | Sara      | Mohammed | Sara1125@gmail.com | 2022-04-20       | 2022-04-22    |
| 89     | Ghala     | AlQarni  | Ghala121@gmail.com | 2022-01-01       | 2022-01-05    |
| 245    | Aya       | Babkoor  | AyaBab98@gmail.com | 2022-02-10       | 2022-02-12    |
| 593    | Rana      | Abdullah | RanaAbd0@gmail.com | 2022-05-25       | 2022-05-27    |

**Update Recipe Difficulty Level :**

- **UPDATE CR.Recipe**

```
SET difficultyLevel = 'Hard'
WHERE recipeID = 263;
```

**After**

| recipeID | title            | cookingTi... | difficultyLe... | averageRating | userID |
|----------|------------------|--------------|-----------------|---------------|--------|
| 200      | Chicken Parmesan | 45           | Medium          | 4.20          | 593    |
| 263      | Pasta Carbonara  | 30           | Hard            | 4.50          | 593    |
| 489      | Chocolate Cake   | 60           | Difficult       | 4.70          | 44     |
| 509      | kabsa            | 60           | Medium          | 5.00          | 89     |
| 537      | Vegetable Curry  | 40           | Medium          | 4.30          | 89     |
| 5112     | Fried Eggs       | 10           | Easy            | 4.80          | 3      |

**Before**

| recipeID | title            | cookingTi... | difficultyLe... | averageRating | userID |
|----------|------------------|--------------|-----------------|---------------|--------|
| 200      | Chicken Parmesan | 45           | Medium          | 4.20          | 593    |
| 263      | Pasta Carbonara  | 30           | Medium          | 4.50          | 593    |
| 489      | Chocolate Cake   | 60           | Difficult       | 4.70          | 44     |
| 509      | kabsa            | 60           | Medium          | 5.00          | 89     |
| 537      | Vegetable Curry  | 40           | Medium          | 4.30          | 89     |
| 5112     | Fried Eggs       | 10           | Easy            | 4.80          | 3      |



## • DELETE data from a Table

Delete Review by UserID :

- DELETE FROM CR.Review**

```
WHERE userID = 3 AND rate = 4;
```

Before

| userID | rate | comment                                     |
|--------|------|---------------------------------------------|
| 3      | 4    | Quick and easy, great for breakfast.        |
| 44     | 4    | Moist and rich, loved the chocolate flavor. |
| 89     | 4    | Delicious! Will make again.                 |
| 245    | 5    | Perfect recipe, loved it!                   |
| 593    | 5    | Fantastic dish, everyone enjoyed it.        |

After

| userID | rate | comment                                     |
|--------|------|---------------------------------------------|
| 44     | 4    | Moist and rich, loved the chocolate flavor. |
| 89     | 4    | Delicious! Will make again.                 |
| 245    | 5    | Perfect recipe, loved it!                   |
| 593    | 5    | Fantastic dish, everyone enjoyed it.        |

Delete Ingredient from a Recipe :

- DELETE FROM CR.Contain**

```
WHERE ingredientID = 5 AND recipeID = 489;
```

After

| ingredientID | recipeID |
|--------------|----------|
| 2            | 200      |
| 1            | 263      |
| 4            | 489      |
| 5            | 489      |
| 6            | 489      |
| 7            | 489      |
| 8            | 509      |
| 10           | 509      |
| 3            | 5112     |
| 6            | 489      |
| 7            | 489      |
| 8            | 509      |
| 10           | 509      |
| 3            | 5112     |

Before

| ingredientID | recipeID |
|--------------|----------|
| 2            | 200      |
| 1            | 263      |
| 4            | 489      |
| 5            | 489      |
| 6            | 489      |
| 7            | 489      |
| 8            | 509      |
| 10           | 509      |
| 3            | 5112     |

# SQL QUERIES USING SELECT COMMAND



- Subquery

Find users who have created recipes with an average rating greater than 4.0 :

- ```
SELECT userID, firstName, lastName
  FROM CR.Users
 WHERE userID IN (
    SELECT userID
      FROM CR.Recipe
     WHERE averageRating > 4.0
);
```

| userID | firstName | lastName |
|--------|-----------|----------|
| 3 | Rema | AlGhamdi |
| 44 | Sara | Mohammed |
| 89 | Ghala | AlQarni |
| 593 | Rana | Abdullah |

Find recipes with cooking time greater than the average cooking time :

- ```
SELECT title, cookingTime
 FROM CR.Recipe
 WHERE cookingTime > (
 SELECT AVG(cookingTime)
 FROM CR.Recipe
);
```

| title            | cookingTime |
|------------------|-------------|
| Chicken Parmesan | 45          |
| Chocolate Cake   | 60          |
| kabsa            | 60          |

- **WHERE**

Count the number of users who have logged in :

- ```
SELECT COUNT(*) AS loggedInUsers
FROM CR.Users
WHERE lastLoginData IS NOT NULL;
```

| loggedInUsers |
|---------------|
| 5 |

Recipes with Average Rating above 4 :

- ```
SELECT * FROM CR.Recipe
WHERE averageRating > 4;
```

| recipeID | title            | cookingTime | difficultyLe... | averageRating | userID |
|----------|------------------|-------------|-----------------|---------------|--------|
| 200      | Chicken Parmesan | 45          | Medium          | 4.20          | 593    |
| 263      | Pasta Carbonara  | 30          | Hard            | 4.50          | 593    |
| 489      | Chocolate Cake   | 60          | Difficult       | 4.70          | 44     |
| 509      | kabsa            | 60          | Medium          | 5.00          | 89     |
| 537      | Vegetable Curry  | 40          | Medium          | 4.30          | 89     |
| 5112     | Fried Eggs       | 10          | Easy            | 4.80          | 3      |

## • ORDER BY

Recipe with steps ordered by Duration :

```
• SELECT R.title, S.description, S.duration
 FROM CR.Recipe R
 JOIN CR.Step S ON R.recipeID = S.recipeID
 ORDER BY S.duration;
```

| title            | description                                                                            | duration |
|------------------|----------------------------------------------------------------------------------------|----------|
| Pasta Carbonara  | Boil water then cook the pasta for 15 min then mix it with the sauce.                  | 10       |
| Chicken Parmesan | Fry bacon and garlic in a pan with Coconut Oil for half an hour .                      | 5        |
| Fried Eggs       | Hatch the eggs and mix them in a bowl, then put a frying pan on the fire with a l...   | 3        |
| Chocolate Cake   | Mix flour, sugar, baking powder and vanilla in a dish, and water, oil and milk in...   | 10       |
| kabsa            | onions, garlic, and ginger in oil, add kabsa spice mix, stir, then add meat (usuall... | 15       |
| Vegetable Curry  | Sauté onions, garlic, and ginger in oil, add spices, stir, then add chopped veget...   | 15       |

Top 5 Recipes with Highest Ratings :

```
• SELECT * FROM CR.Recipe
 ORDER BY averageRating DESC
 LIMIT 5;
```

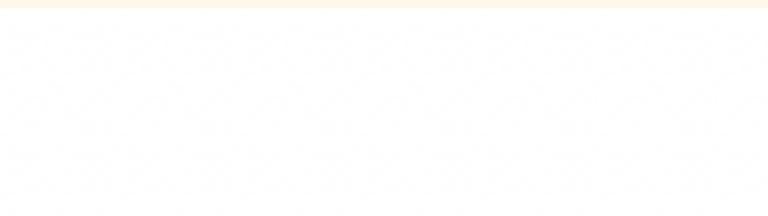
| recipeID | title           | cookingTime | difficultyLevel | averageRating | userID |
|----------|-----------------|-------------|-----------------|---------------|--------|
| 509      | kabsa           | 60          | Medium          | 5.00          | 89     |
| 5112     | Fried Eggs      | 10          | Easy            | 4.80          | 3      |
| 489      | Chocolate Cake  | 60          | Difficult       | 4.70          | 44     |
| 263      | Pasta Carbonara | 30          | Hard            | 4.50          | 593    |
| 537      | Vegetable Curry | 40          | Medium          | 4.30          | 89     |



## • JOIN

Recipes with Ingredients with Spice Level :

- ```
SELECT R.title, I.name, I.spiceLevel
FROM CR.Recipe R
JOIN CR.Contain C ON R.recipeID = C.recipeID
JOIN CR.Ingredient I ON C.ingredientID = I.ingredientID
WHERE I.spiceLevel IS NOT NULL;
```



| title | name | spiceLevel |
|-------|------|------------|
| | | |
| | | |

• GROUP BY

Recipes with Average Rating and Ingredients Count :

- ```
SELECT R.title, R.averageRating, COUNT(C.ingredientID) AS ingredientCount
FROM CR.Recipe R
JOIN CR.Contain C ON R.recipeID = C.recipeID
GROUP BY R.title, R.averageRating;
```

| title            | averageRating | ingredientCou... |
|------------------|---------------|------------------|
| Chicken Parmesan | 4.20          | 1                |
| Pasta Carbonara  | 4.50          | 1                |
| Chocolate Cake   | 4.70          | 3                |
| kabsa            | 5.00          | 2                |
| Fried Eggs       | 4.80          | 1                |

## • LEFT JOIN

Recipes and Users with No Reviews :

- ```
SELECT R.title, U.firstName, U.lastName
  FROM CR.Recipe R
  JOIN CR.Users U ON R.userID = U.userID
 LEFT JOIN CR.Review Re ON R.recipeID = Re.userID
 WHERE Re.rate IS NULL;
```

| title | firstName | lastName |
|------------------|-----------|----------|
| Chicken Parmesan | Rana | Abdullah |
| Pasta Carbonara | Rana | Abdullah |
| Chocolate Cake | Sara | Mohammed |
| kabsa | Ghala | AlQarni |
| Vegetable Curry | Ghala | AlQarni |
| Fried Eggs | Rema | AlGhamdi |

• HAVING

Ingredients Used in More Than One Recipe:

- ```
SELECT I.name, COUNT(C.recipeID) AS recipeCount
 FROM CR.Ingredient I
 JOIN CR.Contain C ON I.ingredientID = C.ingredientID
 GROUP BY I.name
 HAVING recipeCount > 1;
```

| name | recipeCount |
|------|-------------|
|      |             |





THANK YOU