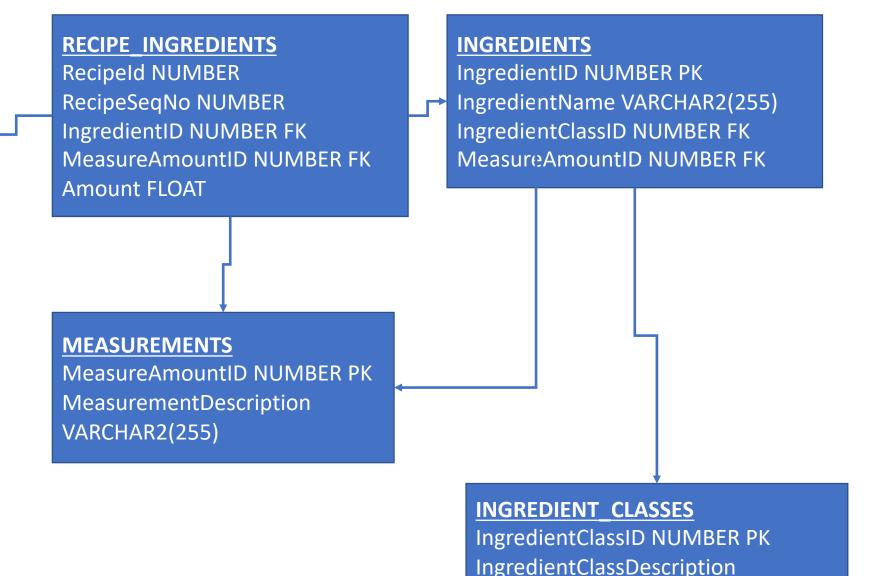
- Examples and practice using Inner and Outer Joins
- Filtering joins with the WHERE clause
- An introduction to subqueries
- An introduction to views

Load Recipes Table and Data

- Load and run the scripts RecipesStructureMy.SQL and RecipesDataMy.SQL from the Class 7 scripts folder in Moodle.
- Practice inner joins using examples on the Recipe tables found in Chapter 8 of the textbook.

Schema source: SQL Queries For Mere Mortals, 4th Ed., John Viescas, Pearson

RECIPES Recipeld NUMBER PK RecipeTitle VARCHAR2(255) RecipeClassID NUMBER FK Preparation VARCHAR2(4000) Notes VARCHAR2(4000) **RECIPE CLASSES** RecipeClassID NUMBER PK RecipeClassDescription VARCHAR2(255)



VARCHAR2(255)

Recipe title, preparation, and recipe class for all recipes

```
SELECT RecipeTitle,
          Preparation,
          RecipeClassDescription
FROM Recipe_Classes
INNER JOIN Recipes
ON Recipe_Classes.RecipeClassID = Recipes.RecipeClassID
```

Order by recipe class

```
SELECT RecipeTitle,

Preparation,

RecipeClassDescription

FROM Recipe_Classes

INNER JOIN Recipes

ON Recipe_Classes.RecipeClassID = Recipes.RecipeClassID

ORDER BY RecipeClassDescription
```

Get only main course recipe class

```
Preparation,

RecipeClassDescription

FROM Recipe_Classes

INNER JOIN Recipes

ON Recipe_Classes.RecipeClassID = Recipes.RecipeClassID

WHERE RecipeClassDescription = 'Main course'
```

Get all recipes having beef (IngredientID 1) and garlic (IngredientID 9) as ingredients

```
SELECT DISTINCT Recipes.RecipeTitle
FROM Recipes
INNER JOIN Recipe_Ingredients
ON Recipes.RecipeID =
    Recipe_Ingredients.RecipeID
WHERE Recipe_Ingredients.IngredientID IN (1, 9)
```

Get all recipes having beef and garlic as ingredients (USING clause instead of ON)

```
SELECT DISTINCT Recipes.RecipeTitle
FROM Recipes
INNER JOIN Recipe_Ingredients
USING (RecipeID)
WHERE Recipe_Ingredients.IngredientID IN (1, 9)
```

Get all recipes having beef (IngredientID 1) and garlic (IngredientID 9) as ingredients

```
SELECT DISTINCT Recipes.RecipeTitle
FROM Recipes
INNER JOIN Recipe_Ingredients
   USING (RecipeID)
WHERE Recipe_Ingredients.IngredientID IN (
   SELECT IngredientId FROM Ingredients
   WHERE IngredientName = 'Beef'
        OR IngredientName = 'Garlic'
)
```

The inner SELECT is a **Subquery!**

Use an outer join to get ingredients that are not used in any recipes

```
SELECT i.IngredientID,
    i.IngredientName,
    ri.RecipeID
FROM Ingredients i
LEFT OUTER JOIN Recipe Ingredients ri
    ON i.IngredientID = ri. IngredientID
WHERE ri.RecipeID IS NULL
```

List all the ingredients in Irish Stew

```
SELECT I.INGREDIENTNAME, I.INGREDIENTID
FROM INGREDIENTS I
JOIN RECIPE INGREDIENTS RI
ON RI.INGREDIENTID = I.INGREDIENTID
WHERE RECIPEID = (
     SELECT RECIPEID FROM RECIPES WHERE
     RECIPETITLE='Irish Stew'
```

List all recipes that require at least 1 whole onion

Recipes that use an oven

Recipes that use dairy (milk products or eggs)

Create a view for easier querying

```
CREATE VIEW Dairy Recipes View
AS
SELECT DISTINCT r.RecipeTitle FROM Recipes r
INNER JOIN Recipe Ingredients ri
     ON r.RecipeID = ri.RecipeID
INNER JOIN Ingredients i
     ON ri.IngredientID = i.IngredientID
INNER JOIN Ingredient Classes ic
        ON i.IngredientClassID = ic.IngredientClassID
WHERE ic. IngredientClassDescription = 'Dairy'
```

Now we can just query the view!

- SELECT RecipeTitle FROM Dairy_Recipes_View;
- You can query a view like a table
- Views are stored as database objects
- Unlike tables, views do not hold data themselves