**Pt. 1**

**ingredients** **ingredient\_classes** **measurements recipes**

IngredientID IngredientClassID MeasureAmountID RecipeID

IngredientName IngredientClassDescription MeasureDescription RecipeTitle

IngredientClassID RecipeClassID

MeasureAmountID **recipe\_ingredients** Preparation

RecipeIDNotes

**recipe\_classes** RecipeSeqNo

RecipeClassID IngredientID

RecipeClassDescription MeasureAmountID

Amount

**Primary Keys/Foreign Keys**

Ingredients: IngredientID (PK), IngredientClassID (FK)[ingredient\_classes],

MeasureAmountID (FK)[measurements]

ingredient\_classes: IngredientClassID (PK)

measurements: MeasureAmountID (PK)

recipes: RecipeID (PK), RecipeClassID (FK)[recipe\_classes]

recipe\_classes: RecipeClassID (PK)

recipe\_ingredients: [RecipeID + RecipeSeqNo] (PK)

**Table Relationships**

ingredients -> ingredient\_classes : many to one

ingredient\_classes -> ingredients : one to many

ingredients -> measurements : many to one

measurements -> ingredients : one to many

recipes -> recipe\_classes : many to one

recipe\_classes -> recipes : one to many

**Pt. 2**

**1. Select all ingredients that are either a dairy or wine using a union. (HINT: Wine needs to be extracted from the ingredient name)**

SELECT i.IngredientID, i.IngredientName, i\_c.IngredientClassDescription, i\_c.IngredientClassID

FROM ingredients AS i, ingredient\_classes AS i\_c

WHERE i.IngredientClassID = i\_c.IngredientClassID

AND i\_c.IngredientClassDescription = 'Dairy'

UNION

SELECT i.IngredientID, i.IngredientName, i\_c.IngredientClassDescription, i\_c.IngredientClassID

FROM ingredients AS i, ingredient\_classes AS i\_c

WHERE i.IngredientClassID = i\_c.IngredientClassID

AND i.IngredientName LIKE '%Wine%'

ORDER BY IngredientClassID ASC, IngredientName ASC;

**2. Display all the recipes that are main dishes.**

SELECT r.RecipeID, r.RecipeTitle, r\_c.RecipeClassDescription, r.Preparation

FROM recipes AS r, recipe\_classes AS r\_c

WHERE r.RecipeClassID = r\_c.RecipeClassID

AND r\_c.RecipeClassDescription = 'Main course'

ORDER BY r.RecipeTitle ASC;

**3. Display all the types of lettuces.**

SELECT i.IngredientName, i.IngredientID

FROM ingredients AS i

WHERE i.IngredientName LIKE '%Lettuce%'

ORDER BY i.IngredientName ASC;

**4. Display all types of Meat or Seafood ingredients.**

SELECT i.IngredientName, i.IngredientID, i\_c.IngredientClassDescription, i\_c.IngredientClassID

FROM ingredients AS i, ingredient\_classes AS i\_c

WHERE i.IngredientClassID = i\_c.IngredientClassID

AND i\_c.IngredientClassDescription IN ('Meat', 'Seafood')

ORDER BY i\_c.IngredientClassDescription ASC, i.IngredientName ASC;

**5. Display the recipes in increasing order by the number of ingredients they have/use.**

SELECT COUNT(r\_i.RecipeID) AS NumIngredients, r.RecipeTitle, r.RecipeID, r.Preparation

FROM recipes AS r LEFT OUTER JOIN recipe\_ingredients AS r\_i

ON r.RecipeID = r\_i.RecipeID

GROUP BY r.RecipeID ASC

ORDER BY NumIngredients ASC, r.RecipeTitle ASC;

**6. What measurements are used in making Fettuccini Alfredo, in units of measure, i.e., “Cup”?**

SELECT r\_i.Amount, m.MeasurementDescription, i.IngredientName, i.IngredientID

FROM recipe\_ingredients AS r\_i, measurements AS m, ingredients AS i

WHERE r\_i.RecipeID = 5

AND r\_i.IngredientID = i.IngredientID

AND r\_i.MeasureAmountID = m.MeasureAmountID

ORDER BY r\_i.RecipeSeqNo;

**7. Display all recipes that require less than 5 ingredients.**

SELECT COUNT(r\_i.RecipeID) AS NumIngredients, r.RecipeTitle, r.RecipeID, r.Preparation

FROM recipes AS r LEFT OUTER JOIN recipe\_ingredients AS r\_i

ON r.RecipeID = r\_i.RecipeID

GROUP BY r.RecipeID ASC

HAVING NumIngredients < 5

ORDER BY NumIngredients ASC, r.RecipeTitle ASC;

**8. Display all recipeID's that have 3 or more ingredients (without using aggregate functions)**

SELECT DISTINCT r\_i.RecipeID AS ThreePlusIngredientRecipeIDs

FROM recipe\_ingredients AS r\_i

WHERE r\_i.RecipeSeqNo >= 3

ORDER BY r\_i.RecipeID;

**9. Display all recipeID's that have 3 or more ingredients (using aggregate functions)**

SELECT r.RecipeID, COUNT(r\_i.RecipeID) AS NumIngredients

FROM recipes AS r LEFT OUTER JOIN recipe\_ingredients AS r\_i

ON r.RecipeID = r\_i.RecipeID

GROUP BY r.RecipeID ASC

HAVING NumIngredients >= 3

ORDER BY r.RecipeID ASC;

**10. List every ingredient and its corresponding recipeID. Also include ingredients that are not in any recipes. (Hint: Use left outer join)**

SELECT i.IngredientName, r\_i.RecipeID

FROM ingredients AS i LEFT OUTER JOIN recipe\_ingredients AS r\_i

ON i.IngredientID = r\_i.IngredientID

ORDER BY i.IngredientName ASC, r\_i.RecipeID ASC;