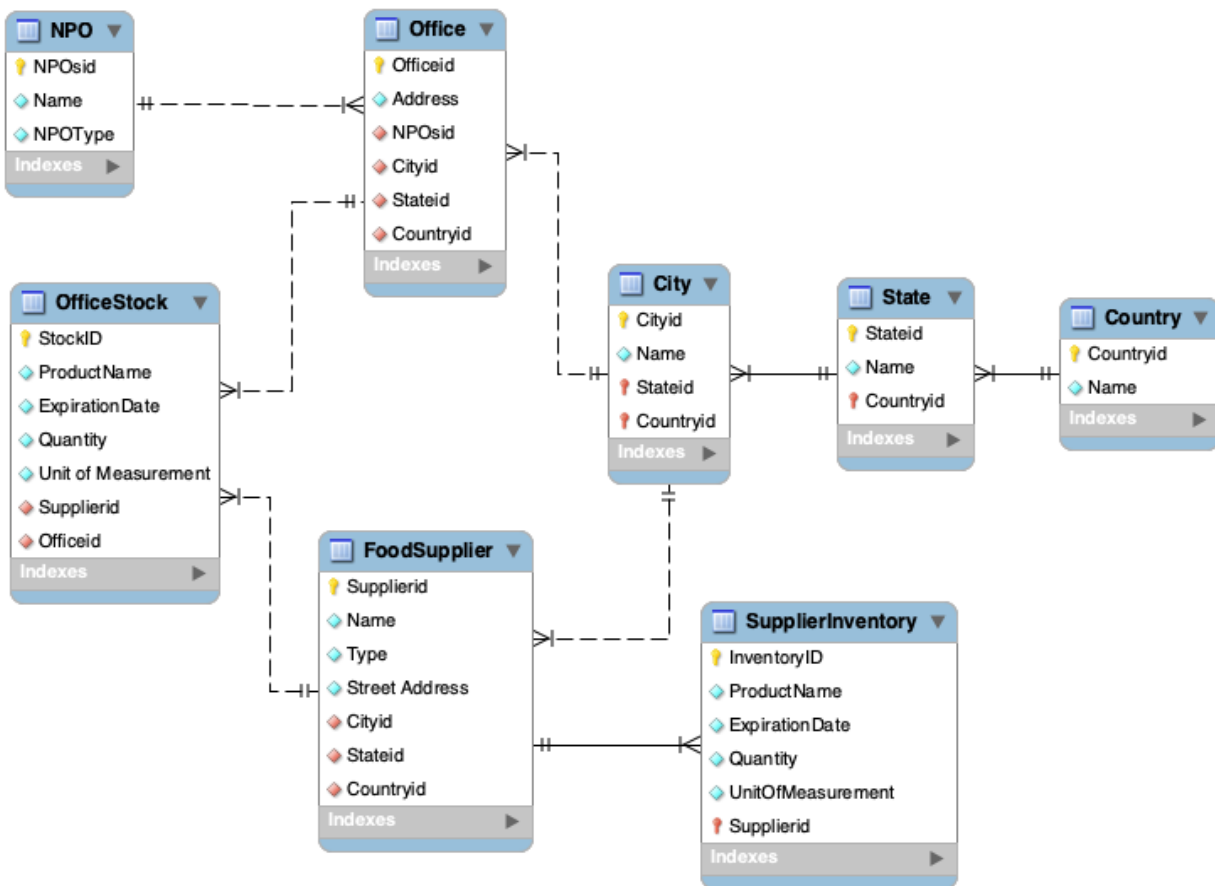


Food Waste - Database Design and SQL

Description:

Grocery stores and other food retailers often have left over food stock in their shelves that are near expiration. Unfortunately, these stores are left to throw out these expired and near-expired food leading to a large amount of food waste. Our database is designed to tackle the problem of food waste by allowing non-profit organizations (NPOs) like food banks to query information about nearby food retailers. Using our database, they may query which food suppliers near them have specific types of food and when it expires. So, they can offer to purchase the foods that will be expiring soon at bulk discounts to eliminate waste. They can also keep track of what products in their office stock are going to run out. Assuming these queries are performed in late September, i.e., food with expiration date in October is close to expiration.

Data Model:



Queries:

#1: Our NPO realizes that tomatoes are in high demand. He wants to check if his primary sources, Jusgo or GW has at least 15lbs of tomatoes in one of the stores that have the expiration date of 29th of November. Order by total tomato volume.

Execute:

```
> SELECT
    foodSupplier.supplierName AS Name,
    SUM(supplierInv.quantity) AS AvailablePoundOfTomato
FROM
    supplierInv,
    foodSupplier
WHERE
    supplierInv.supplierID = foodSupplier.supplierID
    AND foodSupplier.supplierName REGEXP 'Jusgo|GW'
    AND supplierInv.expDate = '2022-11-29'
    AND (SELECT
        SUM(supplierInv.quantity)
    FROM
        supplierInv,
        foodSupplier
    WHERE
        supplierInv.supplierid = foodSupplier.supplierID
        AND supplierInv.productName REGEXP 'Tomato|tomato'
        AND foodSupplier.supplierName REGEXP 'Jusgo|GW') > 15
GROUP BY foodSupplier.supplierName
ORDER BY AvailablePoundOfTomato DESC;
```

Output:

```
+ ----- + ----- +
| Name    | AvailablePoundOfTomato |
+ ----- + ----- +
| Jusgo   | 64                     |
| GW      | 28                     |
+ ----- + ----- +
```

#2: Our NPO FoodForEveryone wants to find all the addresses of Food Suppliers in the same city as their Athens office. Order by supplier names.

Execute:

```

> SELECT
    foodSupplier.supplierName,
    foodSupplier.streetAddress,
    city.cityName
FROM
    foodSupplier
    JOIN
    city ON city.cityID = foodSupplier.cityID
WHERE
    city.cityName REGEXP 'Athens'
ORDER BY foodSupplier.supplierName;

```

Output:

```

+ ----- + ----- + ----- +
| supplierName | streetAddress | cityName |
+ ----- + ----- + ----- +
| Earth Fare   | 1689 S Lumpkin St | Athens   |
| Kroger       | 191 Alps Rd     | Athens   |
| Hmart        | 171 International Dr | Athens   |
+ ----- + ----- + ----- +

```

#3: Our NPO wants to see how much milk in Publix in Atlanta, GA is expiring soon in October that they may be able to purchase.

Execute:

```

> SELECT
    supplierName,
    cityName,
    productName,
    SUM(quantity) AS totalAmount,
    expDate
FROM
    state
    JOIN
    city ON state.stateID = city.cityID
    JOIN
    foodSupplier ON city.cityID = foodSupplier.cityID
    JOIN
    supplierInv ON foodSupplier.supplierID = supplierInv.supplierID
WHERE
    cityName = 'Atlanta'

```

```

AND stateName = 'Georgia'
AND productName = 'Milk'
AND expDate >= '2022-10-01'
AND expDate < '2022-10-31'
AND supplierName REGEXP 'publix|Publix'
GROUP BY supplierName , cityName , productName , expDate;

```

Output:

```

+-----+-----+-----+-----+-----+
| supplierName | cityName | productName | totalAmount | expDate |
+-----+-----+-----+-----+-----+
| Publix at Piedmont | Atlanta | Milk | 1 | 2022-10-15 |
| Publix at Piedmont | Atlanta | Milk | 2 | 2022-10-26 |
+-----+-----+-----+-----+-----+

```

#4: NPO wants to find products that have the maximum amount among all foods and at least 10 units in inventory at all suppliers in GA state, So, NPO can know where to easily order large amounts of certain foods.

Execute:

```

> SELECT
    supplierName,
    streetAddress,
    stateName,
    productName,
    MAX(supplierInv.quantity) AS Total
FROM
    state
    JOIN
    city ON state.stateID = city.cityID
    JOIN
    foodSupplier ON city.cityID = foodSupplier.cityID
    JOIN
    supplierInv ON foodSupplier.supplierID = supplierInv.supplierID
WHERE
    stateName REGEXP 'Georgia'
GROUP BY supplierName , streetAddress , stateName , productName
HAVING MAX(supplierInv.quantity) > 10
ORDER BY MAX(supplierInv.quantity) DESC;

```

Output:

```

+-----+-----+-----+-----+-----+
| supplierName | streetAddress | stateName | productName | Total |
+-----+-----+-----+-----+-----+
| Publix at Piedmont | 595 Piedmont Ave NE | Georgia | Eggs | 27 |
| Sprouts Farmers Market | 1845 Piedmont Ave NE Ste 500 | Georgia | Eggs | 27 |
| Sprouts Farmers Market | 1845 Piedmont Ave NE Ste 500 | Georgia | Honey | 21 |
| Sprouts Farmers Market | 1845 Piedmont Ave NE Ste 500 | Georgia | Cookies | 21 |

```

Publix at Piedmont	595 Piedmont Ave NE	Georgia	Tomatoes	13
--------------------	---------------------	---------	----------	----

#5: Our NPO hears that across their locations, eggs are not selling very well at the local food suppliers. They are interested in buying eggs. However, they only want to purchase eggs that are expiring soon (October). So, they want to find which food suppliers have near-expired eggs and their exact expiration dates.

Execute:

```
> SELECT
  supplierInv.productName AS Product,
  supplierInv.expDate,
  supplierInv.quantity,
  supplierInv.unitOfMeasurement,
  foodSupplier.supplierName AS Supplier,
  foodSupplier.streetAddress,
  foodSupplier.cityID,
  foodSupplier.stateID
FROM
  supplierInv
  JOIN
  foodSupplier ON supplierInv.supplierID = foodSupplier.supplierID
WHERE
  productName REGEXP 'eggs|Eggs'
  AND expDate < '2022-11-01';
```

Output:

Product	expDate	quantity	unitOfMeasurement	Supplier	streetAddress
cityID	stateID				
Eggs	2022-10-30	27	Oz	Publix at Piedmont	595 Piedmont Ave NE
1					1
Eggs	2022-10-24	27	Oz	Kroger	191 Alps Rd
					2
					1

#6: A NPO in GA wants to run a sandwich donation at the end of September. So, they want to know how many pounds of tomatoes that are expiring in the October or later they can buy. Since the amount of sandwiches they can provide depends on the amount tomatoes they can buy. Assuming each pound of tomatoes can make ten sandwiches.

Execute:

```
> SELECT
    productName,
    SUM(supplierInv.quantity) AS Total,
    unitOfMeasurement AS Unit,
    (10 * (SUM(supplierInv.quantity))) AS Sandwich
FROM
    state
    JOIN
    city ON state.stateID = city.cityID
    JOIN
    foodSupplier ON city.cityID = foodSupplier.cityID
    JOIN
    supplierInv ON foodSupplier.supplierID = supplierInv.supplierID
WHERE
    stateName REGEXP 'Georgia'
    AND productName REGEXP 'Tomato|tomato'
    AND expDate >= '2022-10-01'
GROUP BY productName , unitOfMeasurement;
```

Output:

productName	Total	Unit	Sandwich
Tomatoes	18	Lbs	180

#7: Our NPO wants to know which suppliers supplied food for all their offices and what they have in inventory currently with expiration date later than 09/20/2022 ordered by supplier names, product names, expiration date. So, it may be faster and easier to order certain items for all offices later from these suppliers.

Execute:

```
> SELECT
    supplierName,
    productName,
    expDate,
    SUM(quantity) AS quantity
```

```

FROM
    foodSupplier
    JOIN
    supplierInv ON foodSupplier.supplierID = supplierInv.supplierID
WHERE
    NOT EXISTS( SELECT
        *
        FROM
            office
        WHERE
            NOT EXISTS( SELECT
                *
                FROM
                    officeStock
                WHERE
                    officeStock.supplierID = foodSupplier.supplierID
                    AND officeStock.officeID = office.officeID))
    AND supplierInv.expDate > '2022-09-20'
GROUP BY supplierName , productName , expDate
ORDER BY supplierName , productName , expDate;

```

Output:

```

+ ----- + ----- + ----- + ----- +
| supplierName | productName | expDate | quantity |
+ ----- + ----- + ----- + ----- +
| Kroger       | Bananas     | 2022-09-25 | 2        |
| Kroger       | Eggs        | 2022-09-24 | 27       |
| Kroger       | Rice        | 2022-11-01 | 5        |
| Kroger       | Rice        | 2022-11-11 | 2        |
| Kroger       | Tomatoes    | 2022-11-29 | 1        |
| Publix at Piedmont | Apples     | 2022-10-01 | 3        |
| Publix at Piedmont | Apples     | 2022-10-05 | 2        |
| Publix at Piedmont | Bread      | 2022-10-15 | 1        |
| Publix at Piedmont | Eggs       | 2022-09-30 | 27       |
| Publix at Piedmont | Eggs       | 2022-11-01 | 27       |
| Publix at Piedmont | Milk       | 2022-10-15 | 1        |
| Publix at Piedmont | Milk       | 2022-10-26 | 2        |

```

+ ----- + ----- + ----- + ----- +

#8: Our NPO office at Atlanta, GA wants to find the name and address of the supplier that has the largest amount of milk in their inventory among all suppliers at the same city for an upcoming large purchase of milk.

Execute:

```
> SELECT
    supplierName,
    streetAddress,
    cityName,
    stateName,
    productName,
    SUM(quantity) AS totalAmount,
    unitOfMeasurement
FROM
    state
    JOIN
    city ON state.stateID = city.cityID
    JOIN
    foodSupplier ON city.cityID = foodSupplier.cityID
    JOIN
    supplierInv ON foodSupplier.supplierID = supplierInv.supplierID
WHERE
    cityName = 'Atlanta'
    AND stateName = 'Georgia'
    AND productName = 'Milk'
GROUP BY supplierName , streetAddress , cityName , stateName , productName , unitOfMeasurement
HAVING totalAmount = (SELECT
    SUM(quantity)
FROM
    state
    JOIN
    city ON state.stateID = city.cityID
    JOIN
    foodSupplier ON city.cityID = foodSupplier.cityID
    JOIN
    supplierInv ON foodSupplier.supplierID = supplierInv.supplierID
WHERE
    cityName = 'Atlanta'
    AND stateName = 'Georgia'
    AND productName = 'Milk'
GROUP BY supplierName
ORDER BY SUM(quantity) DESC
LIMIT 1);
```


Output:

```
+-----+-----+-----+-----+-----+-----+-----+
+
| supplierName | streetAddress | cityName | stateName | productName | totalAmount | unitOfMeasurement |
+-----+-----+-----+-----+-----+-----+-----+
+
| Publix at Piedmont | 595 Piedmont Ave NE | Atlanta | Georgia | Milk | 30 | Gallons |
+-----+-----+-----+-----+-----+-----+-----+
+
```

#9: Execute: Our NPO office at 1111 S Figueroa St, Los Angeles wants to know what products are not available in the office stock, but available in local supplying stores, their expiration dates, quantities, supplier names, and street addresses, ordered by product names and expiration dates. So, the NPO office can purchase new products and increase the diversity of their food stock.

```
> SELECT
    productName, expDate, quantity, supplierName, streetAddress
FROM
    supplierInv
    JOIN
        foodSupplier ON foodSupplier.supplierID = supplierInv.supplierID
WHERE
    cityID = (SELECT
        cityID
        FROM
            city
        WHERE
            cityName = 'Los Angeles')
    AND NOT EXISTS( SELECT
        *
        FROM
            officeStock
        WHERE
            supplierInv.productName = officeStock.productName
            AND officeStock.officeID = (SELECT
                officeID
                FROM
                    office
                WHERE
                    address = '1111 S Figueroa St')
            AND cityID = (SELECT
                cityID
                FROM
                    city
```

```

WHERE
    cityName = 'Los Angeles'))
ORDER BY productName , expDate;

```

Output:

```

+ ----- + ----- + ----- + ----- + ----- +
| productName | expDate | quantity | supplierName | streetAddress |
+ ----- + ----- + ----- + ----- + ----- +
| Almond Milk | 2022-10-20 | 10 | Ralphs | 11922 S Vermont Ave |
| Black Beans | 2022-10-02 | 10 | Ralphs | 11922 S Vermont Ave |
| Yogurt | 2022-10-10 | 14 | Ralphs | 11922 S Vermont Ave |
+ ----- + ----- + ----- + ----- + ----- +

```

#10: Our NPO in Atlanta, GA was offered a purchasing discount by Publix, so they want to know whether Publix stores in Atlanta, GA have high-demand foods: eggs, bread or apple in stock, if so, what are their quantities and expiration dates? Order by product names and expiration dates.

Execute:

```

> SELECT
    productName,
    expDate,
    quantity,
    unitOfMeasurement,
    supplierName
FROM
    supplierInv
    JOIN
    foodSupplier ON foodSupplier.supplierID = supplierInv.supplierID
WHERE
    productName IN ('Apples' , 'Bread', 'Eggs')
    AND supplierName REGEXP 'Publix|publix'
    AND foodSupplier.cityID = (SELECT
        city.cityID
    FROM
        city
    WHERE
        cityName = 'Atlanta'
        AND stateID = (SELECT
            state.stateID
        FROM
            state

```

```

WHERE
    stateName = 'Georgia'))
ORDER BY productName , expDate;

```

Output:

```

+ ----- + ----- + ----- + ----- + ----- +
| productName | expDate | quantity | unitOfMeasurement | supplierName |
+ ----- + ----- + ----- + ----- + ----- +
| Apples      | 2022-10-01 | 3        | Lbs                | Publix at Piedmont |
| Apples      | 2022-10-05 | 2        | Lbs                | Publix at Piedmont |
| Bread       | 2022-10-15 | 1        | Lbs                | Publix at Piedmont |
| Eggs        | 2022-09-30 | 27       | Oz                 | Publix at Piedmont |
| Eggs        | 2022-11-01 | 27       | Oz                 | Publix at Piedmont |
+ ----- + ----- + ----- + ----- + ----- +

```

Condensed SQL Query Feature Matrix

Query SQL Feature	1	2	3	4	5	6	7	8	9	10
Multiple Table Join	x	x	x	x	x	x	x	x	x	x
Subquery	x						x	x	x	x
Correlated Subquery	x							x	x	x
Group by	x		x			x	x	x		
Group by with Having				x				x		
Order by	x	x		x			x	x		x
Divide							x			
In or Not In										x
Built-In Function/ Calculated Field	x					x				

Regexp	x	x	x		x	x				x
Exists or Not Exist							x		x	