SQL Analytics with U.S. Agriculture Data

Ömer Faruk Durmuş

May 2025

Overview

This project uses open data sets from the US Department of Agriculture to extract meaningful insights using SQL. The tasks involve writing custom queries, joining tables, and applying DQL, DDL, and DML statements to answer specific analytical questions.

Question 1

Can you find out the total milk production for 2023? Your manager wants this information for the annual report. What is the total milk production for 2023?

```
SELECT SUM(Value) AS total_milk_production_2023
FROM milk_production
WHERE Year = 2023;
```

<div align="center">

total_milk_production_2023

35947

</div>

Figure 1: Total Milk Production for 2023

Question 2

Which states had cheese production greater than 100 million in April 2023? The Cheese Department wants to focus their marketing efforts there. How many states are there?

```
SELECT COUNT(DISTINCT State_ANSI) AS num_states
FROM cheese_production
WHERE Year = 2023
  AND Period = 'APR'
  AND Geo_Level = 'STATE'
  AND State_ANSI IS NOT NULL
  AND CAST(Value AS INTEGER) > 100000000;
```

```
num_states
        3
```

Figure 2: States made 100 Million KG Cheese Production

Question 3

Your manager wants to know how the production of coffee has changed over the years. What is the total value of coffee production for 2011?

```
SELECT SUM(CAST(Value AS INTEGER)) AS total_coffee_2011
FROM coffee_production
WHERE Year = 2011;
```

```
total_coffee_2011
              7
```

Figure 3: Total Coffee Production in 2011

Question 4

There's a meeting with the Honey Council next week. Find the average honey production for 2022 so that you are ready.

```
SELECT AVG(Value)
FROM honey_production
WHERE Year = 2022;
```

```
AVG(Value)
   140.25
```

Figure 4: Average Honey Production in 2022

Question 5

The State Relations team wants a list of all state names with their corresponding ANSI codes. Can you generate that list? What is the state ANSI code for Florida?

```
SELECT State_ANSI, State
FROM state_lookup
WHERE State_ANSI;
```

```
State_ANSIState
        1ALABAMA
        2ALASKA
        4ARIZONA
        5ARKANSAS
        6CALIFORNIA
        8COLORADO
        9CONNECTICUT
       10DELAWARE
       12FLORIDA
       13GEORGIA
       15HAWAII
       16IDAHO
       17ILLINOIS
       18INDIANA
       19IOWA
       20KANSAS
       21KENTUCKY
       22LOUISIANA
       23MAINE
       24MARYLAND
       25MASSACHUSETTS
       26MICHIGAN
       27MINNESOTA
       28MISSISSIPPI
       29MISSOURI
       30MONTANA
       31NEBRASKA
       32NEVADA
       33NEW HAMPSHIRE
       34NEW JERSEY
       35NEW MEXICO
       36NEW YORK
          NORTH
       37CAROLINA
       38NORTH DAKOTA
       39OHIO
       40OKLAHOMA
       41OREGON
       42PENNSYLVANIA
       44RHODE ISLAND
       45SOUTH CAROLINA
       46SOUTH DAKOTA
       47TENNESSEE
       48TEXAS
       49UTAH
       50VERMONT
       51VIRGINIA
       53WASHINGTON
       54WEST VIRGINIA
       55WISCONSIN
       56WYOMING
```

Figure 5: ANSI Codes of States

Question 6

Query the states that produced cheese in April 2023.

```
SELECT sl.State, cp.Value
FROM state_lookup sl
LEFT JOIN cheese_production cp
  ON sl.State_ANSI = cp.State_ANSI
  AND cp.Year = 2023
  AND cp.Period = 'APR';
```

State	Value
ALABAMA	
ALASKA	
ARIZONA	
ARKANSAS	
CALIFORNIA	208807000
COLORADO	
CONNECTICUT	
DELAWARE	
FLORIDA	
GEORGIA	
HAWAII	
IDAHO	86452000
ILLINOIS	5068000
INDIANA	
IOWA	31512000
KANSAS	
KENTUCKY	
LOUISIANA	
MAINE	
MARYLAND	
MASSACHUSETTS	
MICHIGAN	
MINNESOTA	69728000
MISSISSIPPI	
MISSOURI	
MONTANA	
NEBRASKA	
NEVADA	
NEW HAMPSHIRE	
NEW JERSEY	4889000
NEW MEXICO	79038000
NEW YORK	66256000
NORTH CAROLINA	
NORTH DAKOTA	
OHIO	20510000
OKLAHOMA	
OREGON	
PENNSYLVANIA	39420000
RHODE ISLAND	
SOUTH CAROLINA	
SOUTH DAKOTA	43253000
TENNESSEE	
TEXAS	
UTAH	
VERMONT	11279000
VIRGINIA	
WASHINGTON	
WEST VIRGINIA	
WISCONSIN	289699000
WYOMING	

Figure 6: Cheese Production Across States in April 2023

Question 7

Can you find the total yogurt production for states in 2022 that also have cheese production data from 2023? This will help the Dairy Division in their planning.

```
SELECT SUM(y.Value) AS total_yogurt_production
FROM yogurt_production y
WHERE y.Year = 2022
  AND y.State_ANSI IN (
    SELECT DISTINCT c.State_ANSI
    FROM cheese_production c
    WHERE c.Year = 2023
  );
```

total_yogurt_production
1171095000

Figure 7: Total Yogurt Production in 2022

Question 8

List all states from state that are missing from milk production in 2023. How many states are there?

```
SELECT COUNT(*) AS missing_state_count
FROM state_lookup sl
WHERE sl.State_ANSI NOT IN (
  SELECT DISTINCT mp.State_ANSI
  FROM milk_production mp
  WHERE mp.Year = 2023
);
```

missing_state_count
26

Figure 8: States Have not Produced Milk in 2023

Question 9

Find the average coffee production for all years where the honey production exceeded 1 million.

```
SELECT AVG(c.Value) AS Avg_Coffee_Production
FROM coffee_production c
WHERE c.Year IN (
  SELECT h.Year
  FROM honey_production h
  WHERE h.Value > 1000000
);
```

Avg_Coffee_Production
5.96666666666667

Figure 9: Average Coffee Production