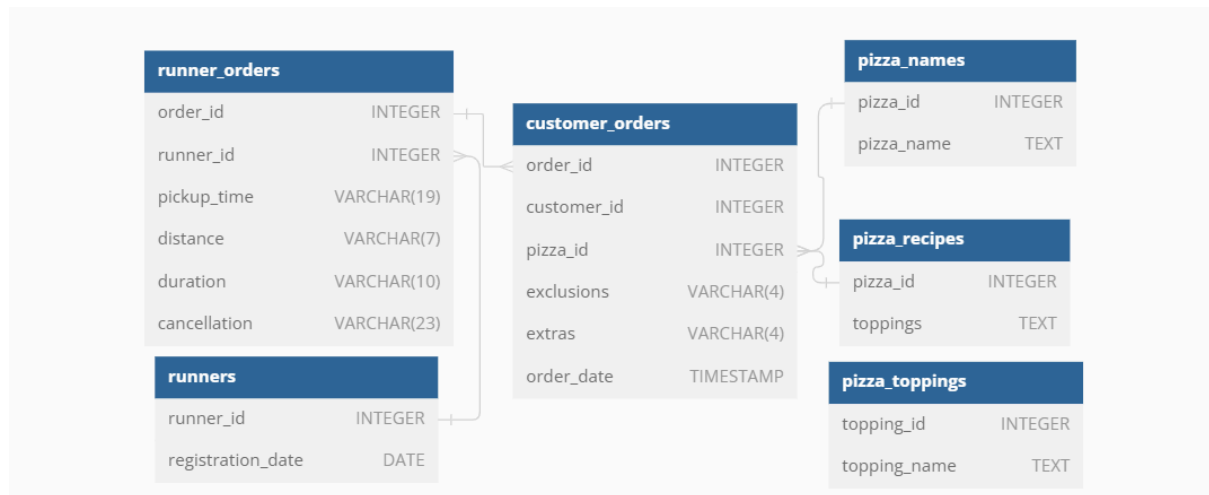


Case Study 2: Pizza Runner

C. Ingredient Optimisation



1. What are the standard ingredients for each pizza?

SELECT

pn.pizza_name,

STRING_AGG(pt.topping_name, ', ') AS standard_ingredients

FROM pizza_recipes pr

JOIN pizza_names pn ON pr.pizza_id = pn.pizza_id

JOIN pizza_toppings pt ON CAST(pt.topping_id AS TEXT) = ANY
(STRING_TO_ARRAY(pr.toppings, ','))

GROUP BY pn.pizza_name

ORDER BY pn.pizza_name;

Results

Query #1 Execution time: 2.31ms

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pizza_name	standard_ingredients
Meatlovers	Bacon, BBQ Sauce, Beef, Cheese, Chicken, Mushrooms, Pepperoni, Salami
Vegetarian	Cheese, Mushrooms, Onions, Peppers, Tomatoes, Tomato Sauce

2. What was the most commonly added extra?

```
SELECT pt.topping_name AS extra_ingredient,  
COUNT(*) AS number_of_times_added  
FROM customer_orders co  
JOIN pizza_toppings pt  
ON CAST(pt.topping_id AS TEXT) = ANY (STRING_TO_ARRAY(co.extras, ','))  
WHERE co.extras IS NOT NULL AND co.extras <> 'null' AND co.extras <> ''  
GROUP BY pt.topping_name ORDER BY number_of_times_added DESC LIMIT 1;
```

Results

Copy as Markdown ↗

Query #1 Execution time: 4.03ms

extra_ingredient	number_of_times_added
Bacon	4

3. What was the most common exclusion?

```
SELECT pt.topping_name AS exclusion,  
COUNT(*) AS number_of_times_excluded  
FROM customer_orders co  
JOIN pizza_toppings pt  
ON CAST(pt.topping_id AS TEXT) = ANY (STRING_TO_ARRAY(co.exclusions, ','))  
WHERE co.exclusions IS NOT NULL AND co.exclusions <> 'null' AND  
co.exclusions <> ''  
GROUP BY pt.topping_name ORDER BY number_of_times_excluded DESC  
LIMIT 1;
```

Results

Copy as Markdown ↗

Query #1 Execution time: 9.71ms

exclusion	number_of_times_excluded
Cheese	4
Mushrooms	1
BBQ Sauce	1

4. Generate an order item for each record in the `customers_orders` table in the format of one of the following: `Meat Lovers / Meat Lovers - Exclude Beef / Meat Lovers - Extra Bacon / Meat Lovers - Exclude Cheese, Bacon - Extra Mushroom, Peppers`

```
SELECT co.order_id, pn.pizza_name ||  
  
CASE  
  
WHEN co.exclusions IS NOT NULL AND co.exclusions <> 'null' AND co.exclusions  
<> "  
  
    THEN ' - Exclude ' || STRING_AGG(DISTINCT pt1.topping_name, ', ')  
  
    ELSE "  
  
END ||  
  
CASE  
  
    WHEN co.extras IS NOT NULL AND co.extras <> 'null' AND co.extras <> "  
  
    THEN ' - Extra ' || STRING_AGG(DISTINCT pt2.topping_name, ', ')  
  
    ELSE "  
  
END AS order_item  
  
FROM customer_orders co  
  
JOIN pizza_names pn  
  
    ON co.pizza_id = pn.pizza_id  
  
LEFT JOIN pizza_toppings pt1  
  
    ON CAST(pt1.topping_id AS TEXT) = ANY (STRING_TO_ARRAY(co.exclusions, '  
''))  
  
LEFT JOIN pizza_toppings pt2  
  
    ON CAST(pt2.topping_id AS TEXT) = ANY (STRING_TO_ARRAY(co.extras, ', '))  
  
GROUP BY co.order_id, pn.pizza_name, co.exclusions, co.extras  
  
ORDER BY co.order_id;
```

Results

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Query #1 Execution time: 1.93ms

order_id	order_item
1	Meatlovers
2	Meatlovers
3	Meatlovers
3	Vegetarian
4	Meatlovers - Exclude Cheese
4	Vegetarian - Exclude Cheese
5	Meatlovers - Extra Bacon
6	Vegetarian
7	Vegetarian - Extra Bacon
8	Meatlovers
9	Meatlovers - Exclude Cheese - Extra Bacon, Chicken
10	Meatlovers - Exclude BBQ Sauce, Mushrooms - Extra Bacon, Cheese
10	Meatlovers

5. Generate an alphabetically ordered comma separated ingredient list for each pizza order from the `customer_orders` table and add a `2x` in front of any relevant ingredients

a. For example: `"Meat Lovers: 2xBacon, Beef, ... , Salami"`

SELECT

co.order_id,

pn.pizza_name || ': ' ||

STRING_AGG(

CASE

WHEN CAST(pt.topping_id AS TEXT) = ANY (STRING_TO_ARRAY(co.extras,
, ' '))

THEN '2x' || pt.topping_name

ELSE pt.topping_name

END, ' ' ORDER BY pt.topping_name

) AS ingredient_list

FROM customer_orders co

JOIN pizza_names pn

```

ON co.pizza_id = pn.pizza_id

JOIN pizza_recipes pr

ON co.pizza_id = pr.pizza_id

JOIN pizza_toppings pt

ON CAST(pt.topping_id AS TEXT) = ANY (STRING_TO_ARRAY(pr.toppings, ','))

GROUP BY co.order_id, pn.pizza_name, co.extras

ORDER BY co.order_id;

```

Results Copy as Markdown

Query #1 Execution time: 11.21ms

order_id	ingredient_list
1	Meatlovers: BBQ Sauce, Bacon, Beef, Cheese, Chicken, Mushrooms, Pepperoni, Salami
2	Meatlovers: BBQ Sauce, Bacon, Beef, Cheese, Chicken, Mushrooms, Pepperoni, Salami
3	Meatlovers: BBQ Sauce, Bacon, Beef, Cheese, Chicken, Mushrooms, Pepperoni, Salami
3	Vegetarian: Cheese, Mushrooms, Onions, Peppers, Tomato Sauce, Tomatoes
4	Meatlovers: BBQ Sauce, BBQ Sauce, Bacon, Bacon, Beef, Beef, Cheese, Cheese, Chicken, Chicken, Mushrooms, Mushrooms, Pepperoni, Pepperoni, Salami, Salami
4	Vegetarian: Cheese, Mushrooms, Onions, Peppers, Tomato Sauce, Tomatoes
5	Meatlovers: BBQ Sauce, 2xBacon, Beef, Cheese, Chicken, Mushrooms, Pepperoni, Salami
6	Vegetarian: Cheese, Mushrooms, Onions, Peppers, Tomato Sauce, Tomatoes
7	Vegetarian: Cheese, Mushrooms, Onions, Peppers, Tomato Sauce, Tomatoes
8	Meatlovers: BBQ Sauce, Bacon, Beef, Cheese, Chicken, Mushrooms, Pepperoni, Salami
9	Meatlovers: BBQ Sauce, 2xBacon, Beef, Cheese, 2xChicken, Mushrooms, Pepperoni, Salami
10	Meatlovers: BBQ Sauce, 2xBacon, Beef, 2xCheese, Chicken, Mushrooms, Pepperoni, Salami
10	Meatlovers: BBQ Sauce, Bacon, Beef, Cheese, Chicken, Mushrooms, Pepperoni, Salami

6. What is the total quantity of each ingredient used in all delivered pizzas sorted by most frequent first?

```

SELECT pt.topping_name,
COUNT(*)
+ COUNT(CASE
WHEN CAST(pt.topping_id AS TEXT) = ANY (STRING_TO_ARRAY(co.extras, ','))
THEN 1
ELSE NULL

```

```

END)

- COUNT(CASE

    WHEN CAST(pt.topping_id AS TEXT) = ANY
    (STRING_TO_ARRAY(co.exclusions, ' '))

    THEN 1

    ELSE NULL

END)

AS total_quantity

FROM customer_orders co

JOIN runner_orders ro ON co.order_id = ro.order_id

JOIN pizza_recipes pr ON co.pizza_id = pr.pizza_id

JOIN pizza_toppings pt ON CAST(pt.topping_id AS TEXT) = ANY
(STRING_TO_ARRAY(pr.toppings, ' '))

WHERE ro.cancellation IS NULL -- Only consider delivered pizzas

GROUP BY pt.topping_name HAVING COUNT(*) > 0

ORDER BY total_quantity DESC;

```

Results

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Query #1 Execution time: 1.49ms

topping_name	total_quantity
Mushrooms	6
Bacon	5
Salami	4
Pepperoni	4
Chicken	4
Beef	4
BBQ Sauce	4
Cheese	3
Tomato Sauce	2
Onions	2
Tomatoes	2
Peppers	2