### ****Base Dataset Query****

sql

Copy code

-- Create a Base Dataset for All Analyses

WITH base\_data AS (

SELECT

-- Common Fields

DATE(request\_time) AS request\_date,

request\_time,

experiment\_limb\_id,

request\_section,

request\_channel,

request\_location,

add\_to\_cart\_flag,

product\_name,

-- Pricing Policy Fields

pricing\_tier,

pricing\_floor,

pricing\_ceiling,

target\_price,

-- Household and User Segmentation

household\_region,

household\_social\_grade,

household\_adults\_count,

household\_mrc\_avg,

-- Experimental Data

experiment\_id,

action\_id,

-- Conversion Metrics

SUM(CASE WHEN add\_to\_cart\_flag = 1 THEN 1 ELSE 0 END) OVER(PARTITION BY experiment\_limb\_id, request\_section) AS section\_add\_to\_cart\_count,

COUNT(\*) OVER(PARTITION BY experiment\_limb\_id, request\_section) AS section\_request\_count,

SAFE\_DIVIDE(

SUM(CASE WHEN add\_to\_cart\_flag = 1 THEN 1 ELSE 0 END) OVER(PARTITION BY experiment\_limb\_id, request\_section),

COUNT(\*) OVER(PARTITION BY experiment\_limb\_id, request\_section)

) \* 100 AS section\_conversion\_rate

FROM

`your\_project.your\_dataset.your\_table`

WHERE

request\_time BETWEEN '2024-01-01' AND '2024-01-31' -- Time Range Filter

AND experiment\_limb\_id IS NOT NULL

AND request\_section IS NOT NULL

AND pricing\_tier IS NOT NULL

)

SELECT

\*,

-- Derived Metrics for Cross-Sell Analysis

SAFE\_DIVIDE(

section\_add\_to\_cart\_count,

section\_request\_count

) AS overall\_conversion\_rate

FROM base\_data;

### ****Explanation of the Query****

1. base\_data **CTE**:
   * Combines all relevant fields from the raw table.
   * Precomputes essential metrics:
     + section\_add\_to\_cart\_count: Total number of add-to-cart actions per experiment limb and section.
     + section\_request\_count: Total number of requests per experiment limb and section.
     + section\_conversion\_rate: Conversion rate per section.
2. **Filters**:
   * **Time Range**: Filters data for a specific analysis window (2024-01-01 to 2024-01-31).
   * Ensures key columns (experiment\_limb\_id, request\_section, and pricing\_tier) are not null.
3. **Household and Segmentation**:
   * Includes fields like household\_region, household\_social\_grade, and household\_mrc\_avg to analyze confounding variables.
4. **Pricing Data**:
   * Includes pricing\_tier, pricing\_floor, pricing\_ceiling, and target\_price for pricing policy analysis.
5. **Derived Metrics**:
   * Adds pre-computed metrics (overall\_conversion\_rate, section\_conversion\_rate) to reduce the need for repetitive calculations in subsequent queries.

### ****Using the Base Dataset for Analysis****

This base dataset can now be used as the input for all subsequent tasks.

#### ****Task 1: Analyze Card Exposure****

sql

Copy code

SELECT

experiment\_limb\_id,

request\_section,

COUNT(\*) AS total\_requests

FROM base\_data

GROUP BY experiment\_limb\_id, request\_section

ORDER BY total\_requests DESC;

#### ****Task 2: Assess Limbs Assigned and Traceability****

sql

Copy code

SELECT

experiment\_limb\_id,

request\_section,

SUM(add\_to\_cart\_flag) AS add\_to\_cart\_count,

SAFE\_DIVIDE(SUM(add\_to\_cart\_flag), COUNT(\*)) \* 100 AS conversion\_rate

FROM base\_data

GROUP BY experiment\_limb\_id, request\_section;

#### ****Task 3: Evaluate Confounding Variables****

sql

Copy code

SELECT

household\_region,

household\_social\_grade,

experiment\_limb\_id,

SUM(add\_to\_cart\_flag) AS add\_to\_cart\_count,

COUNT(\*) AS total\_requests,

SAFE\_DIVIDE(SUM(add\_to\_cart\_flag), COUNT(\*)) \* 100 AS conversion\_rate

FROM base\_data

GROUP BY household\_region, household\_social\_grade, experiment\_limb\_id;

#### ****Task 4: Analyze Pricing Policy Effects****

sql

Copy code

SELECT

pricing\_tier,

experiment\_limb\_id,

AVG(pricing\_floor) AS avg\_pricing\_floor,

AVG(pricing\_ceiling) AS avg\_pricing\_ceiling,

SAFE\_DIVIDE(SUM(add\_to\_cart\_flag), COUNT(\*)) \* 100 AS conversion\_rate

FROM base\_data

GROUP BY pricing\_tier, experiment\_limb\_id;

#### ****Task 5: Link Digital Touchpoints****

sql

Copy code

SELECT

request\_channel,

request\_location,

experiment\_limb\_id,

SUM(add\_to\_cart\_flag) AS add\_to\_cart\_count,

SAFE\_DIVIDE(SUM(add\_to\_cart\_flag), COUNT(\*)) \* 100 AS conversion\_rate

FROM base\_data

GROUP BY request\_channel, request\_location, experiment\_limb\_id;

### ****Advantages of Using a Base Dataset****

****import pandas as pd****

****# Load your dataset****

****df = pd.read\_csv("your\_dataset.csv") # Replace with your dataset file path****

****# Filter non-numerical columns excluding date columns****

****non\_numerical\_columns = df.select\_dtypes(include=['object']).columns****

****# Extract distinct values from each column and store them in a DataFrame****

****distinct\_values\_data = {****

****"Column": [],****

****"Distinct Values": []****

****}****

****for col in non\_numerical\_columns:****

****distinct\_values\_data["Column"].append(col)****

****distinct\_values\_data["Distinct Values"].append(", ".join(map(str, df[col].dropna().unique())))****

****# Convert to DataFrame****

****distinct\_values\_df = pd.DataFrame(distinct\_values\_data)****

****# Save to CSV****

****output\_file = "distinct\_non\_numerical\_values.csv"****

****distinct\_values\_df.to\_csv(output\_file, index=False)****

****print(f"Distinct values saved to {output\_file}")****

****import pandas as pd****

****# Load your dataset****

****df = pd.read\_csv("your\_dataset.csv") # Replace with your dataset file path****

****# Identify non-numerical columns excluding date columns****

****non\_numerical\_columns = df.select\_dtypes(include=['object']).columns****

****date\_columns = df.select\_dtypes(include=['datetime']).columns****

****# Exclude date columns from the list of non-numerical columns****

****columns\_to\_process = [col for col in non\_numerical\_columns if col not in date\_columns]****

****# Extract distinct values from each column and store them in a DataFrame****

****distinct\_values\_data = {****

****"Column": [],****

****"Distinct Values": []****

****}****

****for col in columns\_to\_process:****

****distinct\_values\_data["Column"].append(col)****

****distinct\_values\_data["Distinct Values"].append(", ".join(map(str, df[col].dropna().unique())))****

****# Convert to DataFrame****

****distinct\_values\_df = pd.DataFrame(distinct\_values\_data)****

****# Save to CSV****

****output\_file = "distinct\_non\_numerical\_values.csv"****

****distinct\_values\_df.to\_csv(output\_file, index=False)****

****print(f"Distinct values saved to {output\_file}")****

### ****1. Check the Context of the**** curr\_trading\_activity ****Column****

In the query, the field curr\_trading\_activity is used to identify the activity type, such as **cross-sell** or **regrade**. This column must originate from one of the tables in your dataset. To verify:

* Look at the **table definitions** or **data dictionary** for the column curr\_trading\_activity.
* Use a simple query to inspect the table columns:

sql

Copy code

SELECT \*

FROM bt-con.findcmi-dp-prod.com.dp\_cdm\_tread\_rw.cdm\_dly\_trad

LIMIT 10;

If curr\_trading\_activity exists in this table, it likely stores the activity type for transactions, including cross-sell events.

### ****2. Trace the Source of Joins****

In your query, multiple tables are joined. Each table enriches the data with additional attributes. You need to:

* Check which table contains fields related to **cross-sell-specific attributes** (e.g., product codes, promotion groups, activity types).
* Simplify the joins to isolate the source of cross-sell data:

sql

Copy code

SELECT DISTINCT curr\_trading\_activity, curr\_service\_product\_code, prev\_service\_product\_code

FROM bt-con.findcmi-dp-prod.com.dp\_cdm\_tread\_rw.cdm\_dly\_trad

WHERE LOWER(curr\_trading\_activity) = 'cross-sell';

### ****3. Look for Related Product Information****

Cross-sell typically involves **new product codes** or **promotion groups** added to a customer's existing portfolio. Check the product-related tables (e.g., bvp\_data\_product\_ro):

* Investigate which product categories or service codes represent cross-sell events:

sql

Copy code

SELECT DISTINCT curr\_service\_product\_code, prev\_service\_product\_code, curr\_service\_product\_group\_lv12, prev\_service\_product\_group\_lv12

FROM bt-dp-dataprod-dp-prod.com.dp\_bvp\_data\_product\_ro.vw.bvp\_dp\_202\_bq\_bt\_product\_master\_raw

WHERE curr\_service\_product\_code IS NOT NULL;

### ****4. Validate Using Business Rules****

Ask the following:

* Does cross-sell involve a specific **product type or combination** (e.g., mobile + broadband)?
* Does the dataset record **changes in products** from one category to another? For instance:

sql

Copy code

SELECT \*

FROM bt-con.findcmi-dp-prod.com.dp\_cdm\_tread\_rw.cdm\_dly\_trad

WHERE prev\_service\_product\_code IS NOT NULL

AND curr\_service\_product\_code IS NOT NULL

AND prev\_service\_product\_code != curr\_service\_product\_code;

### ****5. Perform a Data Inspection****

If the dataset contains sample data, inspect for patterns:

* Run queries on each table to see where **"cross-sell"** activity appears.
* Example queries:
  + **Transaction Table**:

sql

Copy code

SELECT DISTINCT curr\_trading\_activity

FROM bt-con.findcmi-dp-prod.com.dp\_cdm\_tread\_rw.cdm\_dly\_trad;

* + **Product Master Table**:

sql

Copy code

SELECT DISTINCT curr\_service\_product\_code, curr\_service\_product\_group\_lv12

FROM bt-dp-dataprod-dp-prod.com.dp\_bvp\_data\_product\_ro.vw.bvp\_dp\_202\_bq\_bt\_product\_master\_raw;

### ****6. Business Logic Check****

Cross-sell often comes from a combination of:

* **Transactional data**: Which records customer interactions and new product purchases.
* **Product data**: Which categorizes services/products to identify new additions.

If curr\_trading\_activity alone does not help, investigate:

* Promotion codes or groupings (e.g., curr\_promotion\_group\_lv12).
* Product codes (curr\_service\_product\_code).

### ****7. Test Individual Tables****

To isolate the **exact table**, test each join in the query:

1. Comment out all joins except the one you suspect.
2. Check if the cross-sell data still appears:

sql

Copy code

SELECT \*

FROM bt-con.findcmi-dp-prod.com.dp\_cdm\_tread\_rw.cdm\_dly\_trad

WHERE LOWER(curr\_trading\_activity) = 'cross-sell';

By isolating tables and tracing relevant fields, you can determine which one is contributing the cross-sell information. Let me know if you'd like help writing queries for further validation!