

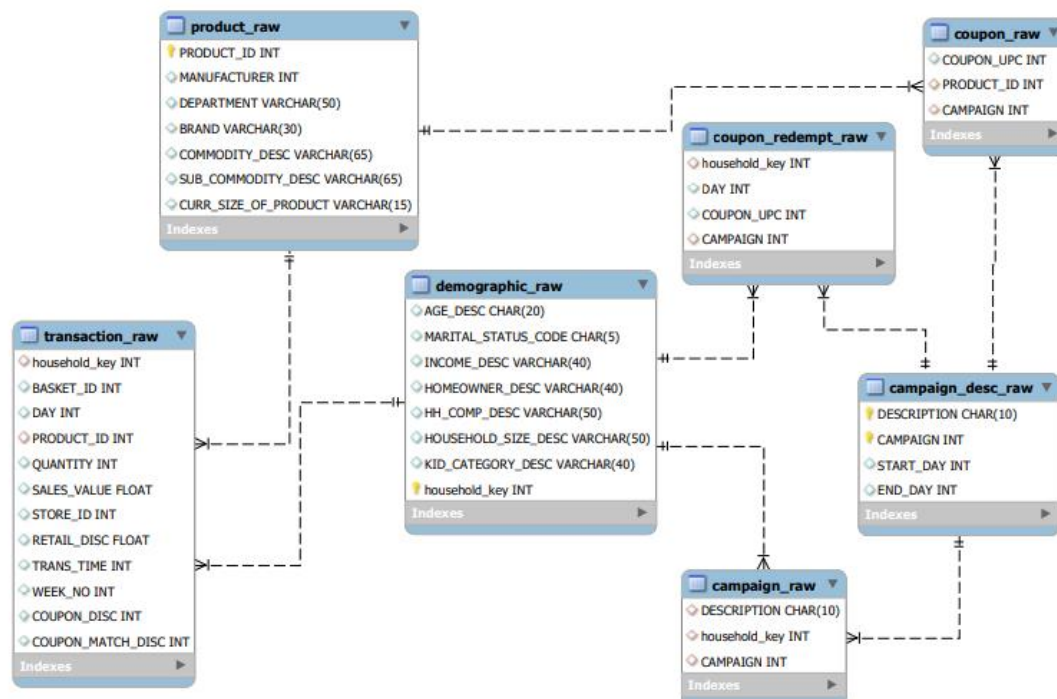
Retail Data Analysis

This dataset contains household-level transactions over two years from a group of 2,500 households who are frequent shoppers at a retailer. It contains all of each household's purchases, not just those from a limited number of categories. For households, demographic information as well as direct marketing contact history are included.

1. **hh_demographic:** This table likely contains demographic information about households. It may include columns such as household_key (a unique identifier for each household), AGE_DESC (age range or category of the household), MARITAL_STATUS_CODE (marital status of the household), INCOME_DESC (income level or range of the household), HOMEOWNER_DESC (homeownership status of the household), HOUSEHOLD_SIZE_DESC (size of the household), KID_CATEGORY_DESC (number of children in the household), and more. This table provides a comprehensive view of the demographic characteristics of each household.
2. **campaign_desc:** This table likely contains descriptions or details of marketing campaigns. It may include columns such as campaign_id (a unique identifier for each campaign), campaign_start_date, campaign_end_date, campaign_type, and other relevant information.
3. **campaign_table:** This table provides information about the different marketing campaign Types that have been conducted.
4. **coupon:** This table likely contains information about coupons or discounts offered to customers. It may include columns such as coupon_id (a unique identifier for each coupon), PRODUCT_ID, CAMPAIGN and other relevant details. This table provides information about the available coupons on different Product.

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5. **coupon_redempt**: This table likely contains data about coupon redemptions. It may include columns such as household_key, coupon_id, redemption_date, and other relevant information. This table helps track and analyze the usage and effectiveness of coupons.
6. **product**: This table likely contains information about different products. It may include columns such as product_id, product_name, category, brand, price, and other relevant attributes. This table provides details about the available products.
7. **transaction_data**: This table likely contains data related to customer transactions. It may include columns such as household_key, BASKET_ID, date, product_id, quantity, price, and other relevant information. This table helps track and analyze customer purchases, including the products bought, quantities, prices, and transaction details.



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KPIS

1. Customer Demographics KPIs:
 - Count of unique households: Measure the total number of unique households in the Demographic table.
 - Household composition distribution: Analyze the distribution of household compositions (HH_COMP_DESC) to understand the composition of households.
 - Age distribution: Calculate the percentage or count of customers in different age groups (AGE_DESC).
 - Marital status distribution: Analyze the proportion of customers in different marital status categories (MARITAL_STATUS_CODE).
 - Income distribution: Determine the distribution of customers across income levels (INCOME_DESC).
 - Homeownership distribution: Calculate the percentage or count of customers who own or rent their homes (HOMEOWNER_DESC).
2. Campaign KPIs:
 - Number of campaigns: Count the total number of campaigns in the Campaign table.
 - Campaign duration: Calculate the duration of each campaign by subtracting the start day from the end day (in the Campaign_desc table).
 - Campaign effectiveness: Analyze the number of households associated with each campaign (in the Campaign table) to measure campaign reach.
3. Coupon KPIs:
 - Coupon redemption rate: Calculate the percentage of coupons redeemed (from the coupon_redempt table) compared to the total number of coupons distributed (from the Coupon table).
 - Coupon usage by campaign: Measure the number of coupon redemptions (from the coupon_redempt table) for each campaign (in the Coupon table).
4. Product KPIs:
 - Sales value: Calculate the total sales value for each product (in the Transaction_data table) to identify top-selling products.
 - Manufacturer distribution: Analyze the distribution of products across different manufacturers (in the Product table).
 - Department-wise sales: Measure the sales value by department (in the Product table) to understand which departments contribute most to revenue.
 - Brand-wise sales: Calculate the sales value for each brand (in the Product table) to identify top-selling brands.
5. Transaction KPIs:
 - Total sales value: Calculate the sum of sales values (in the Transaction_data table) to measure overall revenue.
 - Average transaction value: Calculate the average sales value per transaction to understand customer spending patterns.
 - Quantity sold: Measure the total quantity sold (in the Transaction_data table) to understand product demand.
 - Discounts: Analyze the amount and impact of discounts (RETAIL_DISC, COUPON_DISC, COUPON_MATCH_DISC) on sales value.

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POWER BI

1. Descriptive Analysis:

- Explore demographic characteristics such as age distribution, marital status, income levels, homeownership, household composition, household size, and kid categories.
- Analyze campaign descriptions and duration.
- Examine product details including manufacturer, department, brand, commodity description, sub-commodity description, and size.

2. Customer Segmentation:

- Segment customers based on demographic attributes such as age, marital status, income, and household composition.
- Analyze customer behavior and preferences using transaction data.
- Group customers based on their response to campaigns and coupon redemption.

3. Campaign Performance Analysis:

- Measure the effectiveness of campaigns by analyzing their descriptions, start and end days.
- Determine the number of households associated with each campaign.
- Evaluate the impact of campaigns on coupon redemption and sales.

4. Sales and Revenue Analysis:

- Analyze transaction data to understand sales patterns, quantities, and sales values.
- Identify the top-selling products, brands, and departments.
- Explore the correlation between sales and discounts (retail discount, coupon discount, coupon match discount).

5. Market Basket Analysis:

- Discover associations and relationships between products frequently purchased together using transaction data.
- Identify cross-selling and upselling opportunities.
- Generate product recommendations based on customer purchase history.

6. Time Series Analysis:

- Analyze sales and coupon redemption trends over time.
- Explore seasonality, cyclic patterns, and changes in customer behavior.
- Forecast future sales and coupon redemption based on historical data.

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<https://jupyter-scheduler.readthedocs.io/en/latest/users/index.html#installation>

<https://pypi.org/project/jupyterlab-scheduler/>