**E-Commerce Recommendation**

Leveraging SQL for Personalized Shopping Experiences

***Problem Statement***

* An e-commerce aims to improve user experience and enhance product recommendations by analyzing user interactions and past purchase data.
* The platform seeks to identify trends in user behavior, such as popular products, frequently visited categories, and purchasing patterns, to offer personalized recommendations and boost customer engagement.

***Solution Overview -*** SQL Implementation for E-commerce Recommendation

**Data Modeling and Database Design:**

* Design and create tables to store user interactions, product details, and past purchases.
* Define appropriate data types, primary keys, and foreign key constraints to ensure data integrity.
* Normalize the database schema to minimize redundancy and optimize query performance.

**Data Analysis and Exploration:**

* Utilize SQL queries to perform exploratory data analysis (EDA) on the database tables.
* Analyze user interactions by counting views, clicks, and purchases for each product.
* Identify popular products, frequently interacted categories, and user preferences through SQL aggregation functions and group by clauses.

**User Segmentation and Profiling:**

* Segment users based on their interaction history and purchasing behavior using SQL queries.
* Group users into clusters using techniques such as k-means clustering or hierarchical clustering.
* Create user profiles by aggregating user data, including demographics, preferences, and purchase history.

***Databases Schema***

**Product Table:**

***Columns:***

* **product\_id:** Unique identifier for each product.
* **product\_name:** Name of the product.
* **category:** Category to which the product belongs.
* **price:** Price of the product.
* **brand:** Brand of the product.

***Interactions Table:***

***Columns:***

* **interaction\_id:** Unique identifier for each interaction.
* **user\_id**: Unique identifier for each user.
* **product\_id:** Unique identifier for each product.
* **interaction\_type:** Type of interaction (e.g., view, add to cart, purchase).
* **timestamp:** Timestamp when the interaction occurred.

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**Past Purchases Table:**

***Columns:***

* **purchase\_id:** Unique identifier for each purchase.
* **user\_id:** Unique identifier for each user.
* **product\_id:** Unique identifier for each product that was purchased.
* **purchase\_date:** Date when the purchase occurred.