

# Assignment - 1

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Course : Database Management System for Transaction Management

Code : CSA0593

## Data Analytics System for E-commerce Recommendations.

Build a data analytics database to support product recommendations for an e-commerce website.

### Requirements:

Design tables for users, products, browsing history, purchases and ratings.

### Implementation:

Implement SQL queries to generate product recommendations based on user purchase history and rating patterns.

Write procedure to update recommended products when new purchases or rating are made.

Implement indexing and optimization strategies for real-time data retrieval.

### ER Diagram

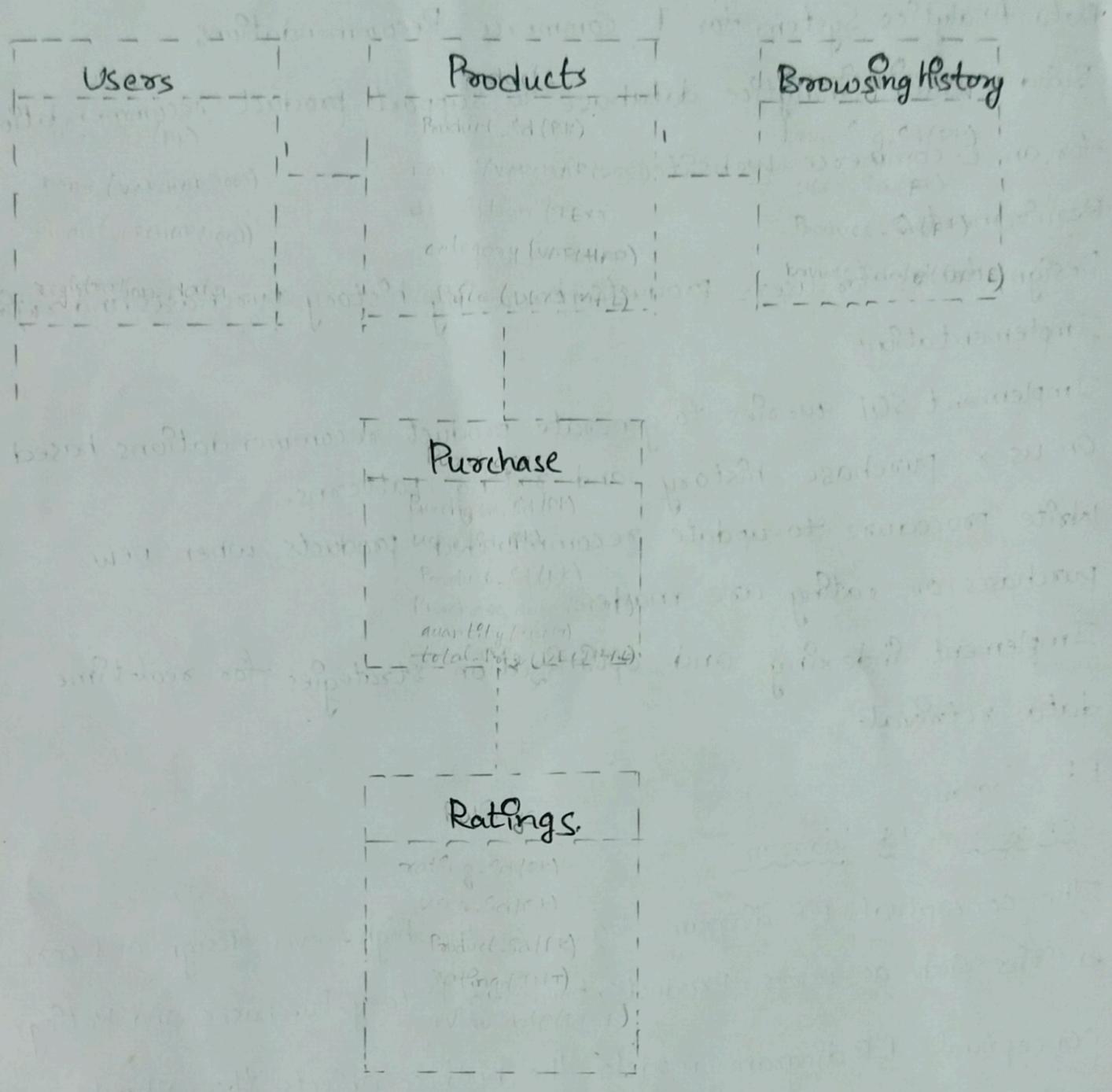
#### Conceptual ER Diagram

The conceptual ER diagram focuses on the high-level design and core entities such as users, products, browsing history, Purchases and Ratings.

Conceptual ER diagram models the business objects that should exist in a system and the relationship between them.

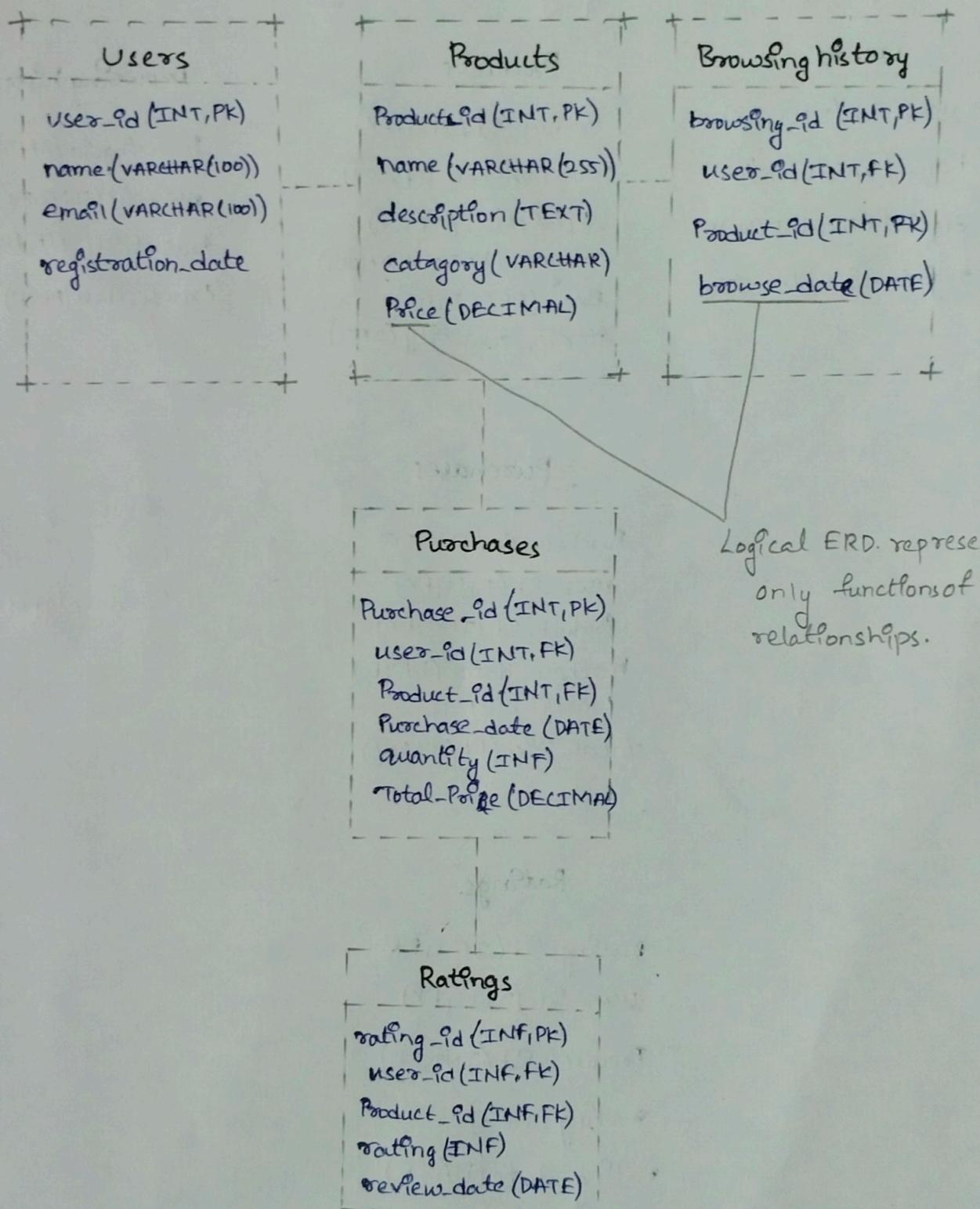
It correctly identifies entities and relationships.

Consider adding an entity for "Category" to further normalize the data.



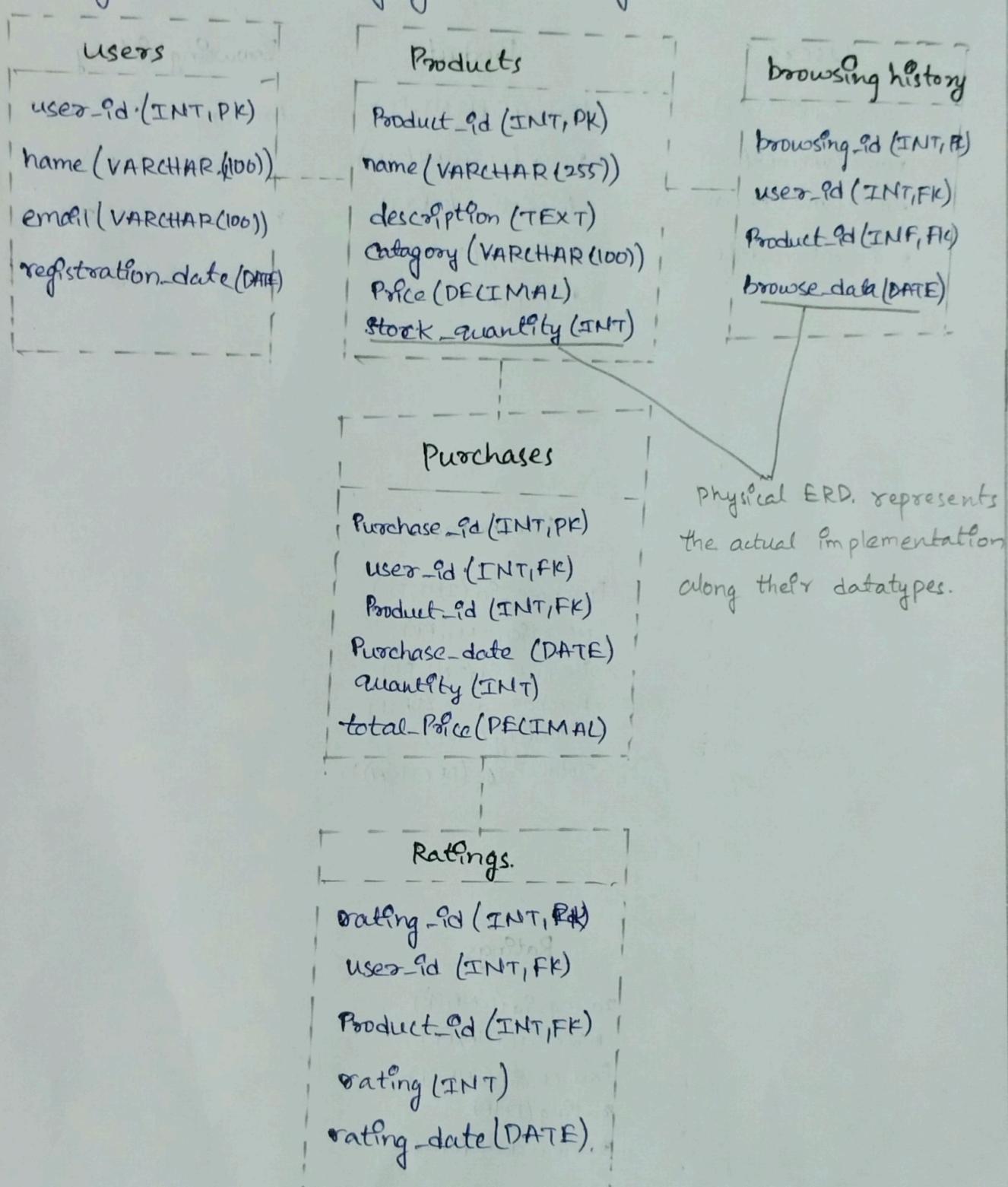
## Logical ER diagram.

The logical ER diagram adds more detail to the relationships and provides a function for translating the conceptual model into a physical scheme. It focuses on the relational aspects of the system.



## Physical ER Diagram.

The physical ER diagram represents the actual implementation structure detailing data types, indexes and additional technical considering efficient querying and storage.



## SQL Statements

### Tables Creation

```
CREATE TABLE Users
```

```
(  
    User-ID INT PRIMARY KEY,  
    Username VARCHAR(50),  
    Email VARCHAR(100),  
    Password VARCHAR(255)  
);
```

```
CREATE TABLE Products
```

```
(  
    Product-ID INT PRIMARY KEY,  
    Name VARCHAR(100),  
    Description TEXT,  
    Price DECIMAL(10,2)  
);
```

```
CREATE TABLE browsing-history.
```

```
(  
    Browsing-ID INT PRIMARY KEY,  
    User-ID INT,  
    Product-ID INT,  
    Timestamp DATETIME,  
    FOREIGN KEY(User-ID) REFERENCES Users (User-ID)  
    FOREIGN KEY(Product-ID) REFERENCES Products (Product-ID)  
);
```

CREATE TABLE Purchases

(  
Purchase-ID INT PRIMARY KEY,  
User-ID INT,  
Product-ID INT,  
Purchase-Date DATETIME,  
FOREIGN KEY (User-ID) REFERENCES Users (User-ID),  
FOREIGN KEY (Product-ID) REFERENCES Products (Product-ID),  
);

CREATE TABLE Ratings

(  
Rating-ID INT PRIMARY KEY,  
User-ID INT,  
Product-ID INT,  
Rating TINYINT,  
Timestamp DATETIME,  
FOREIGN KEY (User-ID) REFERENCES Users (User-ID),  
FOREIGN KEY (Product-ID) REFERENCES Products (Product-ID),  
);

CREATE TABLE RecommendedProducts

(  
Recommended-ID INT PRIMARY KEY,  
User-ID INT,  
Product-ID INT,  
Timestamp DATETIME,  
FOREIGN KEY (User-ID) REFERENCES Users (User-ID),  
FOREIGN KEY (Product-ID) REFERENCES Products (Product-ID),  
);

## Indexing and optimization.

CREATE INDEX idx-users-ID ON Users (User-ID);

CREATE INDEX idx-Products-Product-ID ON Products (Product-ID);

CREATE INDEX idx-Browsing-history-user-ID ON Browsing-history  
(Browsing-ID);

CREATE INDEX idx-Browsing-history-Product-ID ON Browsing-history  
(Product-ID);

CREATE INDEX idx-Purchases-user-ID ON Purchases (User-ID);

CREATE INDEX idx-Purchases-Product-ID ON Purchases (Product-ID);

CREATE INDEX idx-Ratings-user-ID ON Ratings (User-ID);

CREATE INDEX idx-Ratings-Product-ID ON Ratings (Product-ID);

## Conclusion:

These SQL statements Create the database for Data Analytics System for E-commerce recommendations. By this, Can Improve the personalized shopping experience of every Customer and also increases Sales and Conversion rates for merchants

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