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Database Management System Assessment

Question: Online shopping System

Note:

Design database for the given scenario and use DDL and DML statements to perform the CRUD operations.

1.Understand the given problem statement and apply W3H to analyse it.

2.Bring out the list of tables and attributes required for the database design.

3.Apply Normalization.

4.Draw an ER Diagram.

5.Perform the CRUD operations.

W3H Analysis

What?

Q: What are the basics feature need to be implemented?

Ans

1. View Product
2. Search Product
3. Buy Product
4. Add to Cart

Q: Who are the Actors involves in this project?

Ans

1. Customer / Buyer
2. Seller
3. Admin

Q: What are the additional information about the basic feature?

Ans

1) View Product
   i) Product id
   ii) Product name
   iii) Product price
   iv) Product type
2) Search Product
   i) Product id
   ii) Product name
   iii) Search id
3) Buy Product
   i) Purchase id
   ii) Cart id
   iii) Customer id
   iv) Product id
   v) Product name
   vi) Product Price
   vii) Transaction id
4) Add to cart
   i) Cart id
   ii) Product id
   iii) Product name

Q: What are the necessary table should be created?

Ans

1. Customer table
2. Product table
3. Cart table
4. Purchase table
5. Transaction table

How?

1) How to view a product?

Ans

i. By selecting product id
ii. By selecting product name
iii. By selecting both product id and name

2) How to search a product?

Ans

i. By selecting product id
ii. By selecting product name
iii. By selecting both product id and name

3) How to filter the product while searching?

Ans

i. By product type
ii. By product price
iii. By both product type and price

4) How to add a product to cart?

Ans

i. By selecting product name
ii. By selecting product price
iii. By selecting product type

5) How to cancel the stored product in the cart?

Ans

i. By using product name
ii. By using product id
iii. By using product type

6) How to make a purchase of product which stored the in cart?

Ans

i. By using product id
ii. By using Cart id
iii. By using Both product and cart ids

7) How to confirm the purchase of a product?

Ans

i. By using transaction id
ii. By using transaction status
iii. By using transaction amount

8) How will a customer login to this online shopping system?

Ans

i. By using email
ii. By using phone number
iii. By using both email and phone no

Why?	Why Not?
1. **How to view a product?** i. By selecting product id (Because, product id is a unique one) 2. **How to search a product?** i. By selecting both product id and name (Because, searching process can be faster while using both) 3. **How to filter the product while searching?** i. By product type (Because, product type define the difference and category) 4. **How to add a product to cart?** i. By selecting product name (Because, product name will more efficient than other options) 5. **How to cancel the stored product in the cart?** i. By using product id (Because, product id is unique so it show the direct relationship about the product) 6. **How to make a purchase of product which stored the in cart?** i. By using Both product and cart ids (Because, they both are the essential details to be used) 7. **How to confirm the purchase of a product?** i. By using transaction status (Because, transaction status is meant for confirmation of the payment for the product) 8. **How will a customer login to this online shopping system?** i. By using both email and phone number (Because, email and phone number or the essential details for user, used for verification)	**How to view a product?** Change of duplication in the products and product name is cannot to be a unique **How to search a product?** Searching with any one option show less and moderate results **How to filter the product while searching?** Other options of the secondary ones which is compared to the product type **How to add a product to cart?** Other option has less efficiency and relationship as compared to product name **How to cancel the stored product in the cart?** Product name and type can be duplicate so cancellation is a main process so id is more preferable **How to make a purchase of product which stored the in cart?** Both id's are essential so it not be consider any one **How to confirm the purchase of a product?** Transaction id and amount are the field which refer the input but status is value from the verification **How will a customer login to this online shopping system?** Both email and phone number is a contact option so best is to using both options

Tables

Customer
Customer_id (Primary key)
Customer_name (not null)
Customer_age
Customer_gender
Customer_email (not null)
Customer_phone_no (not null)
Cart_id (foreign key)

Product
Product_id (Primary key)
Product_Name (not null)
Product_Type (not null)
Product_price (default 0)

Cart
Cart_id (Primary Key)
Product_id (Foreign key)
Product_name //Partial Dependency

Purchase
Purchase_id (primary key)
Purchase_date (not null)
Cart_id (foreign key)
Customer_id (foreign key)
Product_id (foreign key)
Product_name //Partial Dependency
Product_Price //Partial Dependency
Transaction_id (foreign key)

Transaction
Transaction_id (primary key)
Transaction_status (not null)
Transaction_amount (default 0)
Product_id (foreign key)

After Normalization

Final Tables

Customer
Customer_id (Primary key)
Customer_name (not null)
Customer_age
Customer_gender
Customer_email (not null)
Customer_phone_no (not null)
Cart_id (foreign key)

Product
Product_id (Primary key)
Product_Name (not null)
Product_Type (not null)
Product_price (default 0)

Cart
Cart_id (Primary Key)
Product_id (Foreign key)

Purchase
Purchase_id (primary key)
Purchase_date (not null)
Cart_id (foreign key)
Customer_id (foreign key)
Product_id (foreign key)
Transaction_id (foreign key)

Transaction
Transaction_id (primary key)
Transaction_status (not null)
Transaction_amount (default 0)
Product_id (foreign key)

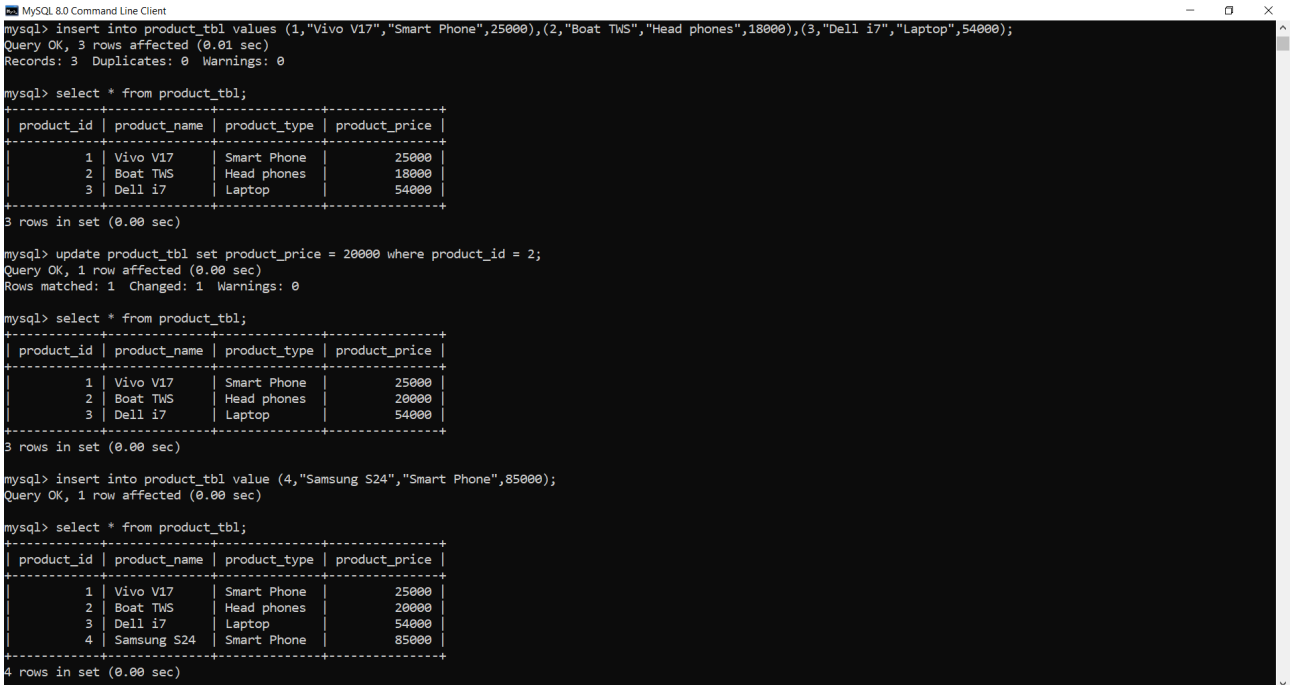
CRUD Operation on each Tables

Product

```
Select MySQL 8.0 Command Line Client
mysql> create database oss_db;
Query OK, 1 row affected (0.01 sec)

mysql> use oss_db;
Database changed
mysql> create table product_tbl(product_id int primary key,product_name varchar(30) not null,product_type varchar(15) not null,product_price int default 0);
Query OK, 0 rows affected (0.03 sec)

mysql> desc product_tbl;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| product_id   | int         | NO   | PRI | NULL    |       |
| product_name | varchar(30) | NO   |     | NULL    |       |
| product_type | varchar(15) | NO   |     | NULL    |       |
| product_price| int         | YES  |     | 0       |       |
+--------------+-------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```



```
MySQL 8.0 Command Line Client
mysql> insert into product_tbl values (1,"Vivo V17","Smart Phone",25000),(2,"Boat TWS","Head phones",18000),(3,"Dell i7","Laptop",54000);
Query OK, 3 rows affected (0.01 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> select * from product_tbl;
+------------+--------------+--------------+---------------+
| product_id | product_name | product_type | product_price |
+------------+--------------+--------------+---------------+
|          1 | Vivo V17     | Smart Phone  |         25000 |
|          2 | Boat TWS     | Head phones  |         18000 |
|          3 | Dell i7      | Laptop       |         54000 |
+------------+--------------+--------------+---------------+
3 rows in set (0.00 sec)

mysql> update product_tbl set product_price = 20000 where product_id = 2;
Query OK, 1 row affected (0.00 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from product_tbl;
+------------+--------------+--------------+---------------+
| product_id | product_name | product_type | product_price |
+------------+--------------+--------------+---------------+
|          1 | Vivo V17     | Smart Phone  |         25000 |
|          2 | Boat TWS     | Head phones  |         20000 |
|          3 | Dell i7      | Laptop       |         54000 |
+------------+--------------+--------------+---------------+
3 rows in set (0.00 sec)

mysql> insert into product_tbl value (4,"Samsung S24","Smart Phone",85000);
Query OK, 1 row affected (0.00 sec)

mysql> select * from product_tbl;
+------------+--------------+--------------+---------------+
| product_id | product_name | product_type | product_price |
+------------+--------------+--------------+---------------+
|          1 | Vivo V17     | Smart Phone  |         25000 |
|          2 | Boat TWS     | Head phones  |         20000 |
|          3 | Dell i7      | Laptop       |         54000 |
|          4 | Samsung S24  | Smart Phone  |         85000 |
+------------+--------------+--------------+---------------+
4 rows in set (0.00 sec)
```

MySQL 8.0 Command Line Client

```
mysql> insert into product_tbl value (4,"Samsung S24","Smart Phone",85000);
Query OK, 1 row affected (0.00 sec)

mysql> select * from product_tbl;
+------------+--------------+--------------+---------------+
| product_id | product_name | product_type | product_price |
+------------+--------------+--------------+---------------+
|          1 | Vivo V17     | Smart Phone  |         25000 |
|          2 | Boat TWS     | Head phones  |         20000 |
|          3 | Dell i7      | Laptop       |         54000 |
|          4 | Samsung S24  | Smart Phone  |         85000 |
+------------+--------------+--------------+---------------+
4 rows in set (0.00 sec)

mysql> delete from product_tbl where product_id = 4;
Query OK, 1 row affected (0.00 sec)

mysql> select * from product_tbl;
+------------+--------------+--------------+---------------+
| product_id | product_name | product_type | product_price |
+------------+--------------+--------------+---------------+
|          1 | Vivo V17     | Smart Phone  |         25000 |
|          2 | Boat TWS     | Head phones  |         20000 |
|          3 | Dell i7      | Laptop       |         54000 |
+------------+--------------+--------------+---------------+
3 rows in set (0.00 sec)

mysql>
```

Cart

```
mysql> Create table cart_tbl(cart_id int primary key,product_id int, foreign key(product_id) references product_tbl(product_id));;
Query OK, 0 rows affected (0.02 sec)

    -> ^C
mysql> insert into cart_tbl values (1,1),(2,2),(3,3);
Query OK, 3 rows affected (0.01 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> select * from cart_tbl;
+---------+------------+
| cart_id | product_id |
+---------+------------+
|       1 |          1 |
|       2 |          2 |
|       3 |          3 |
+---------+------------+
3 rows in set (0.00 sec)

mysql> insert into cart_tbl value (4,3);
Query OK, 1 row affected (0.01 sec)

mysql> select * from cart_tbl;
+---------+------------+
| cart_id | product_id |
+---------+------------+
|       1 |          1 |
|       2 |          2 |
|       3 |          3 |
|       4 |          3 |
+---------+------------+
4 rows in set (0.00 sec)

mysql> update cart_tbl set cart_id = 5 where cart_id = 4;
Query OK, 1 row affected (0.00 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

MySQL 8.0 Command Line Client

```
mysql> update cart_tbl set cart_id = 5 where cart_id = 4;
Query OK, 1 row affected (0.00 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from cart_tbl;
+---------+------------+
| cart_id | product_id |
+---------+------------+
|       1 |          1 |
|       2 |          2 |
|       3 |          3 |
|       5 |          3 |
+---------+------------+
4 rows in set (0.00 sec)

mysql> delete from cart_tbl where cart_id = 5;
Query OK, 1 row affected (0.00 sec)

mysql> select * from cart_tbl;
+---------+------------+
| cart_id | product_id |
+---------+------------+
|       1 |          1 |
|       2 |          2 |
|       3 |          3 |
+---------+------------+
3 rows in set (0.00 sec)

mysql>
```

Customer

MySQL 8.0 Command Line Client

```
mysql> create table customer_tbl(cus_id int primary key,cus_name varchar(20) not null,cus_age int,cus_gender varchar(6),cus_email varchar(50) not null,cus_number varchar(13
) not null,cart_id int,foreign key(cart_id) references cart_tbl(cart_id));
Query OK, 0 rows affected (0.02 sec)

mysql> desc customer_tbl;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| cus_id     | int         | NO   | PRI | NULL    |       |
| cus_name   | varchar(20) | NO   |     | NULL    |       |
| cus_age    | int         | YES  |     | NULL    |       |
| cus_gender | varchar(6)  | YES  |     | NULL    |       |
| cus_email  | varchar(50) | NO   |     | NULL    |       |
| cus_number | varchar(13) | NO   |     | NULL    |       |
| cart_id    | int         | YES  | MUL | NULL    |       |
+------------+-------------+------+-----+---------+-------+
7 rows in set (0.00 sec)

mysql> insert into customer_tbl values (1,"Sanjay",23,"Male","sanjay@gmail.com","+916383587926",1),(2,"Sam",22,"Female","sam@gmail.com","+911234567890",2),(3,"khanna",21,"M
ale","Khanna@gmail.com","1234567890",3);
Query OK, 3 rows affected (0.01 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> select * from customer_tbl;
+--------+----------+---------+------------+-----------------+---------------+---------+
| cus_id | cus_name | cus_age | cus_gender | cus_email       | cus_number    | cart_id |
+--------+----------+---------+------------+-----------------+---------------+---------+
|      1 | Sanjay   |      23 | Male       | sanjay@gmail.com | +916383587926 |       1 |
|      2 | Sam      |      22 | Female     | sam@gmail.com    | +911234567890 |       2 |
|      3 | khanna   |      21 | Male       | Khanna@gmail.com | 1234567890    |       3 |
+--------+----------+---------+------------+-----------------+---------------+---------+
3 rows in set (0.00 sec)

mysql>
```

MySQL 8.0 Command Line Client

```
mysql> insert into customer_tbl values (1,"Sanjay",23,"Male","sanjay@gmail.com","+916383587926",1),(2,"Sam",22,"Female","sam@gmail.com","+911234567890",2),(3,"khanna",21,"M
ale","Khanna@gmail.com","1234567890",3);
Query OK, 3 rows affected (0.01 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> select * from customer_tbl;
+--------+----------+---------+------------+-----------------+---------------+---------+
| cus_id | cus_name | cus_age | cus_gender | cus_email       | cus_number    | cart_id |
+--------+----------+---------+------------+-----------------+---------------+---------+
|      1 | Sanjay   |      23 | Male       | sanjay@gmail.com | +916383587926 |       1 |
|      2 | Sam      |      22 | Female     | sam@gmail.com    | +911234567890 |       2 |
|      3 | khanna   |      21 | Male       | Khanna@gmail.com | 1234567890    |       3 |
+--------+----------+---------+------------+-----------------+---------------+---------+
3 rows in set (0.00 sec)

mysql> insert into customer_tbl value (4,"Vishnu",22,"Male","vish@gmail.com","9876543210",1);
Query OK, 1 row affected (0.00 sec)

mysql> select * from customer_tbl;
+--------+----------+---------+------------+-----------------+---------------+---------+
| cus_id | cus_name | cus_age | cus_gender | cus_email       | cus_number    | cart_id |
+--------+----------+---------+------------+-----------------+---------------+---------+
|      1 | Sanjay   |      23 | Male       | sanjay@gmail.com | +916383587926 |       1 |
|      2 | Sam      |      22 | Female     | sam@gmail.com    | +911234567890 |       2 |
|      3 | khanna   |      21 | Male       | Khanna@gmail.com | 1234567890    |       3 |
|      4 | Vishnu   |      22 | Male       | vish@gmail.com   | 9876543210    |       1 |
+--------+----------+---------+------------+-----------------+---------------+---------+
4 rows in set (0.00 sec)
```

MySQL 8.0 Command Line Client

```
mysql> update customer_tbl set cus_age=23 where cus_name ="Vishnu";
Query OK, 1 row affected (0.00 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from customer_tbl;
+--------+----------+---------+------------+-----------------+---------------+---------+
| cus_id | cus_name | cus_age | cus_gender | cus_email       | cus_number    | cart_id |
+--------+----------+---------+------------+-----------------+---------------+---------+
|      1 | Sanjay   |      23 | Male       | sanjay@gmail.com | +916383587926 |       1 |
|      2 | Sam      |      22 | Female     | sam@gmail.com    | +911234567890 |       2 |
|      3 | khanna   |      21 | Male       | Khanna@gmail.com | 1234567890    |       3 |
|      4 | Vishnu   |      23 | Male       | vish@gmail.com   | 9876543210    |       1 |
+--------+----------+---------+------------+-----------------+---------------+---------+
4 rows in set (0.00 sec)

mysql> delete from customer_tbl where cus_name = "vishnu";
Query OK, 1 row affected (0.00 sec)

mysql> select * from customer_tbl;
+--------+----------+---------+------------+-----------------+---------------+---------+
| cus_id | cus_name | cus_age | cus_gender | cus_email       | cus_number    | cart_id |
+--------+----------+---------+------------+-----------------+---------------+---------+
|      1 | Sanjay   |      23 | Male       | sanjay@gmail.com | +916383587926 |       1 |
|      2 | Sam      |      22 | Female     | sam@gmail.com    | +911234567890 |       2 |
|      3 | khanna   |      21 | Male       | Khanna@gmail.com | 1234567890    |       3 |
+--------+----------+---------+------------+-----------------+---------------+---------+
3 rows in set (0.00 sec)

mysql>
```

Transaction

MySQL 8.0 Command Line Client

```
mysql> Create table transaction_tbl(trans_id int primary key,trans_status varchar(15) not null,trans_amount int default 0,product_id int,foreign key(product_id) references
product_tbl(product_id));
Query OK, 0 rows affected (0.02 sec)

mysql> desc transaction_tbl;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| trans_id     | int         | NO   | PRI | NULL    |       |
| trans_status | varchar(15) | NO   |     | NULL    |       |
| trans_amount | int         | YES  |     | 0       |       |
| product_id   | int         | YES  | MUL | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
4 rows in set (0.00 sec)

mysql> insert into transaction_tbl values(1,"Completed",25000,1),(2,"Incompleted",0,2),(3,"Completed",54000,3);
Query OK, 3 rows affected (0.01 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> select * from transaction_tbl;
+----------+--------------+--------------+------------+
| trans_id | trans_status | trans_amount | product_id |
+----------+--------------+--------------+------------+
|        1 | Completed    |        25000 |          1 |
|        2 | Incompleted  |            0 |          2 |
|        3 | Completed    |        54000 |          3 |
+----------+--------------+--------------+------------+
3 rows in set (0.00 sec)
```

MySQL 8.0 Command Line Client

```
mysql> insert into transaction_tbl value (4,"Incompleted",0,1);
Query OK, 1 row affected (0.00 sec)

mysql> select * from transaction_tbl;
+----------+--------------+--------------+------------+
| trans_id | trans_status | trans_amount | product_id |
+----------+--------------+--------------+------------+
|        1 | Completed    |        25000 |          1 |
|        2 | Incompleted  |            0 |          2 |
|        3 | Completed    |        54000 |          3 |
|        4 | Incompleted  |            0 |          1 |
+----------+--------------+--------------+------------+
4 rows in set (0.00 sec)

mysql> update transaction_tbl set trans_status = "Completed" , trans_amount = 20000 where trans_id = 2;
Query OK, 1 row affected (0.00 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from transaction_tbl;
+----------+--------------+--------------+------------+
| trans_id | trans_status | trans_amount | product_id |
+----------+--------------+--------------+------------+
|        1 | Completed    |        25000 |          1 |
|        2 | Completed    |        20000 |          2 |
|        3 | Completed    |        54000 |          3 |
|        4 | Incompleted  |            0 |          1 |
+----------+--------------+--------------+------------+
4 rows in set (0.00 sec)

mysql> delete from transaction_tbl where trans_status = "Incompleted";
Query OK, 1 row affected (0.00 sec)

mysql> select * from transaction_tbl;
+----------+--------------+--------------+------------+
| trans_id | trans_status | trans_amount | product_id |
+----------+--------------+--------------+------------+
|        1 | Completed    |        25000 |          1 |
|        2 | Completed    |        20000 |          2 |
|        3 | Completed    |        54000 |          3 |
+----------+--------------+--------------+------------+
3 rows in set (0.00 sec)
```

Purchase

MySQL 8.0 Command Line Client

```
mysql> create table purchase_tbl(pur_id int primary key,pur_date date not null,cart_id int,customer_id int,product_id int,trans_id int,foreign key(cart_id) references cart_
tbl(cart_id),foreign key(product_id) references product_tbl(product_id),foreign key(customer_id) references customer_tbl(cus_id),foreign key(trans_id) references transactio
n_tbl(trans_id));
Query OK, 0 rows affected (0.03 sec)

mysql> desc purchase_tbl;
+-------------+------+------+-----+---------+-------+
| Field       | Type | Null | Key | Default | Extra |
+-------------+------+------+-----+---------+-------+
| pur_id      | int  | NO   | PRI | NULL    |       |
| pur_date    | date | NO   |     | NULL    |       |
| cart_id     | int  | YES  | MUL | NULL    |       |
| customer_id | int  | YES  | MUL | NULL    |       |
| product_id  | int  | YES  | MUL | NULL    |       |
| trans_id    | int  | YES  | MUL | NULL    |       |
+-------------+------+------+-----+---------+-------+
6 rows in set (0.00 sec)

mysql> insert into purchase_tbl values (1,'2024-01-10',1,1,1,1),(2,'2024-01-15',2,2,2,2),(3,'2024-01-19',3,3,3,3);
Query OK, 3 rows affected (0.00 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> select * from purchase_tbl;
+--------+------------+---------+-------------+------------+----------+
| pur_id | pur_date   | cart_id | customer_id | product_id | trans_id |
+--------+------------+---------+-------------+------------+----------+
|      1 | 2024-01-10 |       1 |           1 |          1 |        1 |
|      2 | 2024-01-15 |       2 |           2 |          2 |        2 |
|      3 | 2024-01-19 |       3 |           3 |          3 |        3 |
+--------+------------+---------+-------------+------------+----------+
3 rows in set (0.00 sec)
```

```
MySQL 8.0 Command Line Client

mysql> update purchase_tbl set pur_date = '2024-01-18' where pur_id = 3;
Query OK, 1 row affected (0.00 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from purchase_tbl;
+--------+------------+---------+-------------+------------+----------+
| pur_id | pur_date   | cart_id | customer_id | product_id | trans_id |
+--------+------------+---------+-------------+------------+----------+
|      1 | 2024-01-10 |       1 |           1 |          1 |        1 |
|      2 | 2024-01-15 |       2 |           2 |          2 |        2 |
|      3 | 2024-01-18 |       3 |           3 |          3 |        3 |
+--------+------------+---------+-------------+------------+----------+
3 rows in set (0.00 sec)

mysql> delete from purchase_tbl where pur_date = '2024-01-10';
Query OK, 1 row affected (0.00 sec)

mysql> select * from purchase_tbl;
+--------+------------+---------+-------------+------------+----------+
| pur_id | pur_date   | cart_id | customer_id | product_id | trans_id |
+--------+------------+---------+-------------+------------+----------+
|      2 | 2024-01-15 |       2 |           2 |          2 |        2 |
|      3 | 2024-01-18 |       3 |           3 |          3 |        3 |
+--------+------------+---------+-------------+------------+----------+
2 rows in set (0.00 sec)

mysql>
```

ER Diagram :