Introduction to the system

Online Market's database design is used to manage website's data. In this database system users are customers. They can buy products online, place their purchase in a shopping cart, choose their payment type, and leave reviews. This database contains all information about its products and suppliers.

In this Database Management System project, customers can buy products online and the administrator can enter the name and generate the receipt of the purchased product. Administrators can view reports of the products and overall order details. Orders which are placed by the customers, will store into the database and according to the order detail, a bill will be generated and the payment will be paid by the customer.

ER diagram

Entities:

user_info	shopping_basket_item	shop_order
user_address	product_item	order_details
address	product	order_status
country	product_category	order_line
payment_type	variation	User_comment
payment_type_method	variation_option	
shopping_basket	product_var	

Coding part

We created a procedure that groups the data in the order and outputs the quantity and total amount of the product.
And a procedure that counts rows whose prices are increased to 20$.
Function that counts the number of items in the basket which are chosen more than one time.
Exception that disallows entering the name of a product to be less than* 5 characters.
Trigger that shows number of users before inserting a new row.

Normal form

In 1NF, a relation (or table) is said to be in first normal form if it meets the following requirements:
1. No repeating groups: Each column in a table should contain only one value for each row. There should be no repeating groups of columns.
2. Unique column names: Each column in a table should have a unique name.
3. Unique rows: Each row in a table should be unique. There should be no duplicate rows.

1.For example, the "address" table may contain the addresses of users, and in this case, several data may be recorded in one row. To avoid this problem, we have a table "user address", this table helps us exactly to which address of the user we need to send orders and also only one given one is recorded in each row.
2.Each column in a table have unique name.
3.There are not duplicate rows.

A table is said to be in second normal form if it meets the following requirements:
1. It is in first normal form.
2. All non-key columns in the table are fully dependent on the entire primary key.
For example:

```
CREATE TABLE PRODUCTT(
   PRODUCTID NUMBER(5),
   CATEGORYID NUMBER(4) REFERENCES PRODUCT_CATEGORY(CATEGORYID),
   PRODUCTName VARCHAR(40),
   PRODUCT_DEScription CHAR(255),
   CONSTRAINT PK_PRODUCTID PRIMARY KEY (PRODUCTID)
);
   CREATE TABLE PRODUCT_CATEGORY(
   CATEGORYID NUMBER(4),
   CATEGORYName VARCHAR(20),
   CONSTRAINT PK_CATEGORYID PRIMARY KEY (CATEGORYID)
```

The PRODUCTT table has a single-column primary key (PRODUCTID), which means it meets the requirements for 2NF.
The CATEGORYID column is a foreign key that references the CATEGORYID primary key column in the PRODUCT_CATEGORY table, which ensures that there is no partial dependency in the PRODUCTT table.
All non-key columns (CATEGORYID, PRODUCTName, and PRODUCT_DEScription) are fully dependent on the primary key (PRODUCTID). This means that each non-key column is dependent on the entire primary key, rather than just part of it, so there is no partial dependency.

PRODUCTID ->PRODUCTName,PRODUCT_DEScription

Therefore, the PRODUCTT table satisfies the requirements for 2NF, as it has a single-column primary key and all non-key columns are fully dependent on the primary key.

A table is said to be in third normal form if it meets the following requirements:
1. It is in second normal form.
2. There are no transitive dependencies.
For example, The PRODUCTT table
First Normal Form (1NF): The table appears to be in 1NF because all columns contain atomic values (i.e., there are no repeating groups or arrays in any column).

Second Normal Form (2NF): The table appears to be in 2NF because it has a single-column primary key (PRODUCTID) and all non-key columns are fully functionally dependent on the primary key.

Third Normal Form (3NF): The table appears to be in 3NF because there are no transitive dependencies between non-key columns.PRODUCTID (Primary Key): This column uniquely identifies each row in the table. PRODUCTName: It is directly dependent on the primary key (PRODUCTID) and not on any other column in the PRODUCTT table.

PRODUCT_DEScription: It is directly dependent on the primary key (PRODUCTID) and not on any other column in the PRODUCTT table.

PRODUCTID->PRODUCTNAME, PRODUCTNAME->PRODUCTDES == ~~PRODUCTID->PRODUCTDES~~

The CATEGORYID column is a foreign key that references the CATEGORYID primary key column in the PRODUCT_CATEGORY table, so there is no transitive dependency between CATEGORYID and any other non-key column.

Overall, the table has a well-defined primary key (PRODUCTID) and there are no transitive dependencies, so it appears to be in 3NF.