**Online Shopping Application**

1. **Database Design**

**Tables and Attributes**

**1. Users Table**

| **Column** | **Data Type** | **Description** |
| --- | --- | --- |
| \_id | ObjectId | Unique identifier (Primary Key) |
| name | String | User's full name |
| email | String | User's email (Unique) |
| photo | String | User's profile picture URL |
| password | String | Hashed password |
| districtName | String | User's district name (English) |
| districtNameBan | String | User's district name (Bengali) |
| upazilaName | String | User's upazila name (English) |
| upazilaNameBan | String | User's upazila name (Bengali) |
| districtID | String | ID of the district (Foreign Key) |
| upazilaID | String | ID of the upazila (Foreign Key) |
| status | String | Account status (active/inactive) |
| role | String | User role (e.g., user, admin) |

**2. Products Table**

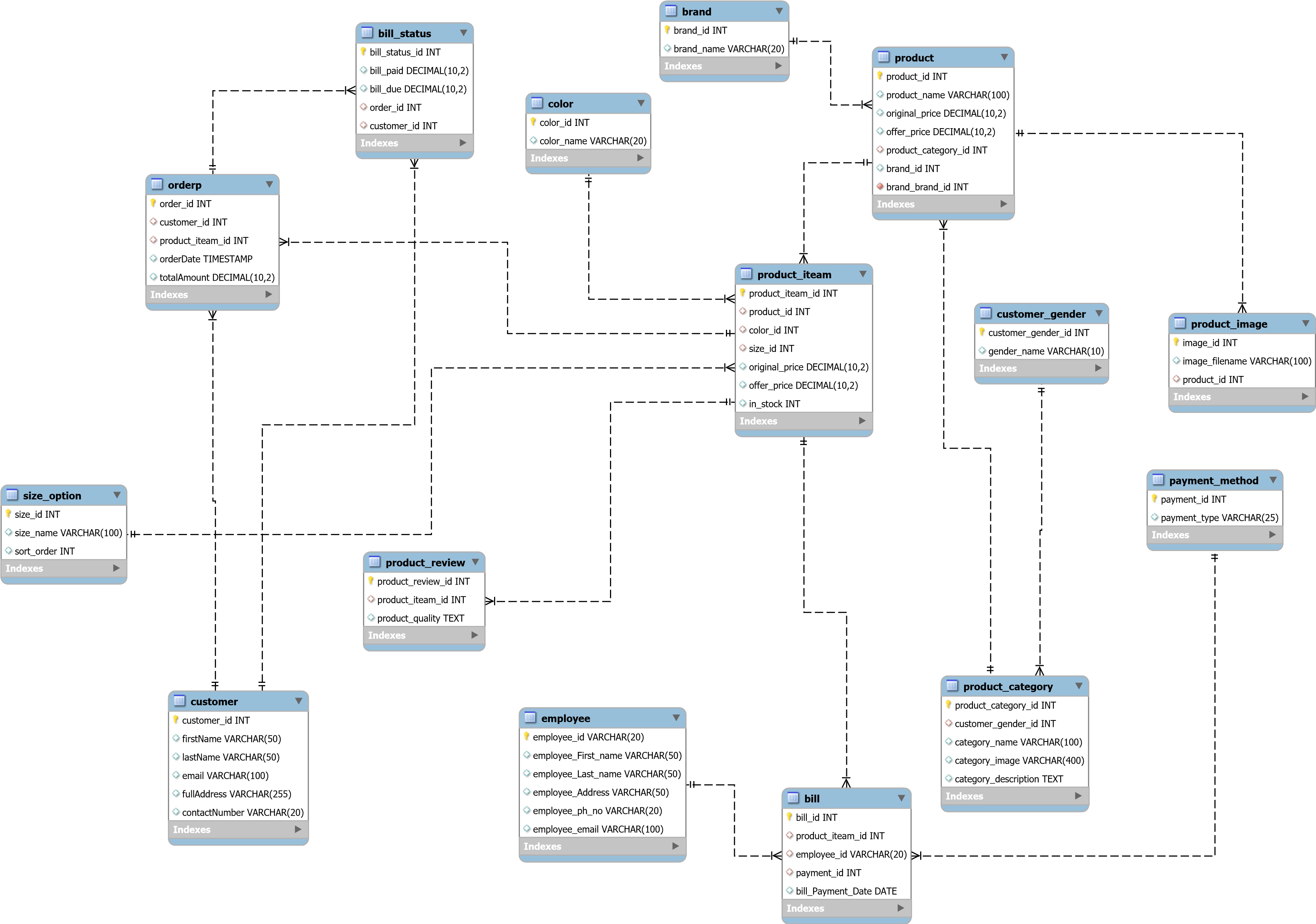
| **Column** | **Data Type** | **Description** |
| --- | --- | --- |
| \_id | ObjectId | Unique identifier (Primary Key) |
| name | String | Product name |
| brand | String | Brand name |
| thumbnail | String | Product image URL |
| description | String | Product description |
| category | String | Category of product |
| price | Number | Price of the product |
| size | String | Size of the product (if applicable) |
| color | String | Color of the product |
| username | String | Name of the seller (Foreign Key - Users) |
| useremail | String | Email of the seller (Foreign Key - Users) |
| date | DateTime | Product creation date |
| status | String | Active or inactive |

**3. Payments Table**

| **Column** | **Data Type** | **Description** |
| --- | --- | --- |
| \_id | ObjectId | Unique identifier (Primary Key) |
| email | String | User email (Foreign Key - Users) |
| name | String | User's name |
| userPhoto | String | User's profile picture URL |
| amount | Number | Payment amount |
| date | DateTime | Payment date |
| productName | String | Name of the purchased product |
| brandName | String | Brand of the purchased product |
| productId | ObjectId | ID of the purchased product (Foreign Key - Products) |
| thumbnail | String | Product image URL |
| transactionId | String | Unique transaction ID |
| paidStatus | Boolean | Payment status (true/false) |

**2. ER Diagram:**

The ER diagram visually represents the relationships between the entities .

The main entities include Users, Products, Categories, Orders, OrderDetails, Cart etc. Attributes and primary keys are defined for each’

# Normalization

Normalization ensures that the database is structured efficiently:

* 1. First Normal Form (1NF)
     + Ensure that all attributes contain atomic values.
     + Example: Splitting full names into FirstName and LastName.
  2. Second Normal Form (2NF)
     + Remove partial dependencies; all non-key attributes are dependent on the entire primary key.
     + Example: Separate order details into an OrderDetails table to remove duplication.
  3. Third Normal Form (3NF)
     + Remove transitive dependencies; non-key attributes should not depend on other non-key attributes.

- Example: Store categories in a separate table to eliminate redundant data in the Products table.