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# **QUIZ 03**

**Question 1:**

**Show the steps of normalization and also elaborate the insertion, deletion and updating anomalies from your selected project schema**

* **Identify Entities and Attributes:**
* **Orders** (Order\_ID, Customer\_ID, Order\_Date)
* **Customers** (Customer\_ID, Customer Name, Address, Email)
* **Products** (Product ID, Product Name, Price, Category ID, Supplier ID)
* **Suppliers** (Supplier ID, Supplier Name, Contact Person, Phone)
* **Order Details** (Order\_ID, Product ID, Quantity)
* **Eliminating Repeating Groups:**

We will going to use composite key to remove repeating groups and reduce redundancy, for example:

Order Details: Order\_ID, Product ID, Quantity (Composite Primary Key)

* **Functional Dependencies:**
* Orders: Order\_ID → Customer\_ID
* Products: Product ID → Product Name, Price, Category ID, Supplier ID
* Order Details: (Order\_ID, Product ID) → Quantity
* **Normalization Rules:**

The system adheres to the principles of normalization to ensure data integrity and prevent anomalies:

* **First Normal Form (1NF):** is satisfied as each attribute contains only atomic values, without any multivalued or composite attributes.
* **Second Normal Form (2NF):** is satisfied since each non-key attribute is fully dependent on the primary key in its respective table.
* **Third Normal Form (3NF):** is satisfied as there are no transitive dependencies, meaning that non-key attributes do not depend on other non-key attributes.

The system does exhibit certain anomalies:

* **Insertion Anomalies:** If a new order is inserted without any corresponding order items in the Order Details table, incomplete data would result.
* **Deletion Anomalies:** Deleting a customer from the Customers table could result in the loss of associated order history unless referential integrity constraints or cascading delete actions are in place.
* **Updating Anomalies:** Updating the price of a product in the Products table requires updating it in all occurrences of that product across the Order Details table, which can be inefficient and lead to errors.

By addressing these anomalies and implementing appropriate measures, the system can ensure data consistency and prevent data integrity issues.