**Bike Store**

**Conceptual Data Model**

Team: **SQLWeavers**

Assignment Number: **3A**

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# What are the **Requirements**?

Creating a conceptual model for a Bike store franchise having a chain of multiple stores along with the Sales Orders history. The model should clearly outline the number of entities being tracked, their relationships along with the data integrity rules.

# What are the **Entities** needed in the data model?

Following is the list of entities that are needed for the data model.

|  |  |
| --- | --- |
| **Entity Name** | **Description** |
| Customer | Details for the customers |
| Order | Details for the customer orders |
| Staffs | Details for the Staff members employed by the stores |
| Order Items | Details for the Items for each order placed |
| Products | Details for the product inventory |
| Brands | Details of the brands that the stores carry |
| Categories | Categories of products on sale in the stores |
| Stocks | On Hand quantity of different products in each store |
| Stores | Details about the different stores |
| Store Contact | Details about the contact information for each store |
| Store Managers | Details about the managers for each store |
| Supply | Details about the supply for each store |
| Warehouse | Details about the warehouses supplying to each store |
| Warehouse Contact | Details about the warehouse contact information |

# What are the **Attributes** for each Entity?

Following is a list of attributes for each entity.

|  |  |
| --- | --- |
| **Entity Name** | **Attributes** |
| Customer | customer\_id INT NOT NULL,  Street VARCHAR(50) NOT NULL,  City VARCHAR(20) NOT NULL,  State VARCHAR(20) NOT NULL,  Postal\_code INT NOT NULL,  email VARCHAR(50) NOT NULL,  First\_Name VARCHAR(20) NOT NULL,  Last\_Name VARCHAR(20) NOT NULL, |
| Order | order\_id INT NOT NULL,  order\_status VARCHAR(40) NOT NULL,  order\_date DATE NOT NULL,  required\_date DATE NOT NULL,  store\_id INT NOT NULL,  shipped\_date DATE NOT NULL,  customer\_id INT NOT NULL,  staff\_id INT NOT NULL, |
| Staffs | staff\_id INT NOT NULL,  name VARCHAR(100) NOT NULL,  email VARCHAR(100) NOT NULL,  status VARCHAR(50) NOT NULL,  salary FLOAT NOT NULL,  store\_id INT NOT NULL,  Manager\_ID INT NOT NULL, |
| Order Items | order\_item\_id INT NOT NULL,  quantity INT NOT NULL,  list\_price FLOAT NOT NULL,  discount INT NOT NULL,  order\_id INT NOT NULL,  product\_id INT NOT NULL, |
| Products | product\_id INT NOT NULL,  product\_name VARCHAR(100) NOT NULL,  model\_year INT NOT NULL,  list\_price FLOAT NOT NULL,  category\_id INT NOT NULL,  brand\_id INT NOT NULL, |
| Brands | brand\_id INT NOT NULL,  brand\_name VARCHAR(100) NOT NULL, |
| Categories | category\_id INT NOT NULL,  category\_name VARCHAR(70) NOT NULL, |
| Stocks | Stock\_id INT NOT NULL,  Quantity INT NOT NULL,  store\_id INT NOT NULL,  product\_id INT NOT NULL, |
| Store | store\_id INT NOT NULL,  street VARCHAR(100) NOT NULL,  state VARCHAR(50) NOT NULL,  postal\_code INT NOT NULL,  city VARCHAR(20) NOT NULL,  store\_name VARCHAR(100) NOT NULL,  email VARCHAR(100) NOT NULL,  Manager\_ID INT NOT NULL, |
| Store Contact | store\_contact INT NOT NULL,  store\_id INT NOT NULL, |
| Store Managers | Manager\_ID INT NOT NULL,  Manager\_name INT NOT NULL, |
| Supply | supply\_id INT NOT NULL,  warehouse\_id INT NOT NULL,  store\_id INT NOT NULL, |
| Warehouse | warehouse\_id INT NOT NULL,  street VARCHAR(50) NOT NULL,  city VARCHAR(20) NOT NULL,  state VARCHAR(20) NOT NULL,  postal\_code INT NOT NULL, |
| Warehouse Contact | warehouse\_contact INT NOT NULL,  warehouse\_id INT NOT NULL, |

# What will be the **Relationships** between the entities?

Following are the relationships between entities

|  |  |  |  |
| --- | --- | --- | --- |
| **From Entity** | **To Entity** | **Relationship** | **Description** |
| Customer | Order | One to Many | One customer can place multiple orders |
| Order | Order Items | One to Many | One order can have multiple items |
| Brands | Products | One to Many | One brand can have multiple products |
| Products | Order Items | One to Many | One Product can be on multiple orders |
| Category | Products | One to Many | One Category can have multiple orders |
| Staff | Order | One to Many | One Staff can book multiple orders |
| Store Manager | Staff | One to Many | One Store Manager can manage multiple staff members |
| Store | Staff | One to Many | One Store can have multiple staff members |
| Store | Store Managers | One to One | One Store can have only one manager |
| Store | Store Contact | One to One | One Store can have only one contact information |
| Store | Supply | One to Many | One Store can have multiple supplies |
| Warehouse | Supply | One to Many | One warehouse can do multiple supply runs |
| Warehouse | Warehouse Contact | One to One | One warehouse will have only one contact information |
| Products | Stocks | One to Many | One Product can be in stock in multiple stores |
| Stores | Products | Many to Many | One store can have multiple products while one Product can be in multiple stores |
| Warehouse | Store | Many to Many | One Warehouse can supply to multiple stores while one store can get supply from multiple stores |

# What are the **Data Integrity** rules?

Following are the rules that will be enforced:

* It’s not mandatory for a customer to have orders. The store can maintain customer information to scope future business.
* It’s not mandatory for each store to have each type of product so the stocks can be zero at any given time.
* Order Items cannot overlap meaning multiple order Items for the same order cannot contain the same product.
* There can never be more than one manager for a store. Also, it’s not possible for a store to have zero staff.
* Categories can have no products linked to it, it’s not mandatory for each category to have a matching product.

# What is the **Data Scope**?

The scope of the data will be limited, the following defines the in/out of scope data.

* In Scope
  + Sales orders, Customers, Inventory Items, Staff, Store and warehouse information including supply details.
* Out of Scope
  + Customer survey results, customer ratings, staff performance details, staff benefits, product requisition details, revenue data etc.

# What is the **Data Model Notation** used?

DMN used here will be **Entity-Relationship Diagrams (ERD).**  
  
A diagram of a company

Description automatically generated

# How well can the model scale?

The model is open and has details about all primary tables. Future scalability can be easily incorporated example, if we want to show warehouse inventory stocks, then it can be easily incorporated.

# How will the data be audited or logged?

Auditing is not enabled yet, it can be added later as the data grows.

# How well will the model perform?

All tables have clearly defined primary and foreign keys. Constraints and indexes can be created as needed based on performance requirements.