

**Nora’s Bagel Bin Database Blueprints**

**First Normal Form (1NF)**

|  |  |
| --- | --- |
| **BAGEL ORDER** | |
| PK | Bagel Order ID |
| PK | Bagel ID |
|  | Order Date |
|  | First Name |
|  | Last Name |
|  | Address 1 |
|  | Address 2 |
|  | City |
|  | State |
|  | Zip |
|  | Mobile Phone |
|  | Delivery Fee |
|  | Bagel Name |
|  | Bagel Description |
|  | Bagel Price |
|  | Bagel Quantity |
|  | Special Notes |

**Nora’s Bagel Bin Database Blueprints *(continued)***

**Second Normal Form (2NF)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **BAGEL ORDER** | |  | **BAGEL ORDER LINE ITEM** | |  | **BAGEL** | |
| PK | Bagel Order ID |  | PK / FK | Bagel Order ID |  | PK | Bagel ID |
|  | Order Date | 1:M | PK / FK | Bagel ID | M:1 |  | Bagel Name |
|  | First Name |  |  | Bagel Quantity |  |  | Bagel Description |
|  | Last Name |  |  |  |  |  | Bagel Price |
|  | Address 1 |  |  |  |  |  |  |
|  | Address 2 |  |  |  |  |  |  |
|  | City |  |  |  |  |  |  |
|  | State |  |  |  |  |  |  |
|  | Zip |  |  |  |  |  |  |
|  | Mobile Phone |  |  |  |  |  |  |
|  | Delivery Fee |  |  |  |  |  |  |
|  | Special Notes |  |  |  |  |  |  |

C. I assigned attributes to the 2NF tables based upon their dependency from the 1NF table. For example, attributes such as the Order Date, First Name, Last Name, Address 1, Address 2, City, State, Zip, Mobile Phone, Delivery Fee, and Special Notes all depend upon the Bagel Order ID. Similarly, the Bagel Price, Bagel Description, and the Bagel Name all depend on the Bagel ID. The attributes are assigned in a way so that a proper Bagel Order makes sense and can be realistically performed based on their dependencies.

I determined the cardinality of the tables based on how an order would work rationally. For example, one bagel order can have more than one bagel item, but the bagel order line item’s bagel order id belongs to strictly one order id in the bagel order. This would be considered a one to many (1:M) relationship. In a similar way, the bagel order line item and the bagel table have a many to one (M:1) relationship. This is because there can be many line items per order but one type of bagel for each line item.

**Nora’s Bagel Bin Database Blueprints *(continued)***

**Third Normal Form (3NF)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **BAGEL ORDER** | | |  | **BAGEL ORDER LINE ITEM** | |  | **BAGEL** | |
| PK | Bagel Order ID | |  | PK / FK | Bagel Order ID |  | PK | Bagel ID |
| FK | Customer ID | | 1:M | PK / FK | Bagel ID | M:1 |  | Bagel Name |
|  | Order Date | |  |  | Bagel Quantity |  |  | Bagel Description |
|  | Delivery Fee | |  |  |  |  |  | Bagel Price |
|  | Special Notes | |  |  |  |  |  |  |
|  | M:1 |  |  |  |  |  |  |  |
| **CUSTOMER** | | |  |  |  |  |  |  |
| PK | Customer ID | |  |  |  |  |  |  |
|  | First Name | |  |  |  |  |  |  |
|  | Last Name | |  |  |  |  |  |  |
|  | Address 1 | |  |  |  |  |  |  |
|  | Address 2 | |  |  |  |  |  |  |
|  | City | |  |  |  |  |  |  |
|  | State | |  |  |  |  |  |  |
|  | Zip | |  |  |  |  |  |  |
|  | Mobile Phone | |  |  |  |  |  |  |

E. I assigned the attributes to the 3NF tables based on their dependencies. Specifically, I put repeated data into its own new table called Customer. A new primary key called Customer ID was established in the Customer table and it is also a foreign key in the Bagel Order table. All the attributes in the Customer table relate only to the customer who would be ordering (First Name, Last Name, Address, etc.). The attributes for the Bagel Order table were chosen because they contain the information about the order. The Bagel Order Line Item attributes were chosen since they relate to the Bagel Line Item, such as Bagel Quantity. Lastly, the attributes in the Bagel table were selected since they depend on what bagel would be ordered (Bagel Name, Bagel Price, etc.).

The cardinality was determined based on how an order would be placed. For example, one customer may have many orders, but an order is placed by only one customer. This makes it a many to one (M:1) relationship between the Bagel Order and Customer tables. The relationship between the Bagel Order and Bagel Order Line Item tables is one to many (1:M) because there could be many line items for one order, but only one order for however many line items. Finally, the Bagel Order Line Item and the Bagel tables have a many to one relationship (M:1) because there can be many line items for an order but only one bagel for each line item.

**Nora’s Bagel Bin Database Blueprints *(continued)***

**Final Physical Database Model**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **BAGEL ORDER** | | |  | **BAGEL ORDER LINE ITEM** | | |  | **BAGEL** | |  |
| PK | BagelOrderID | INT |  | PK / FK | BagelOrderID | INT |  | PK | BagelID | CHAR(2) |
| FK | CustomerID | INT | 1:M | PK / FK | BagelID | CHAR(2) | M:1 |  | BagelName | VARCHAR(30) |
|  | OrderDate | TIMESTAMP |  |  | BagelQuantity | INT |  |  | BagelDescription | VARCHAR(30) |
|  | DeliveryFee | NUMERIC(4,2) |  |  |  |  |  |  | BagelPrice | NUMERIC(3,2) |
|  | SpecialNotes | VARCHAR(100) |  |  |  |  |  |  |  |  |
|  | M:1 |  |  |  |  |  |  |  |  |  |
| **CUSTOMER** | | |  |  |  |  |  |  |  |  |
| PK | CustomerID | INT |  |  |  |  |  |  |  |  |
|  | FirstName | VARCHAR(25) |  |  |  |  |  |  |  |  |
|  | LastName | VARCHAR(25) |  |  |  |  |  |  |  |  |
|  | Address1 | VARCHAR(25) |  |  |  |  |  |  |  |  |
|  | Address2 | VARCHAR(25) |  |  |  |  |  |  |  |  |
|  | City | VARCHAR(25) |  |  |  |  |  |  |  |  |
|  | State | VARCHAR(25) |  |  |  |  |  |  |  |  |
|  | Zip | VARCHAR(10) |  |  |  |  |  |  |  |  |
|  | MobilePhone | VARCHAR(10) |  |  |  |  |  |  |  |  |