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Database Design for a Restaurant Management System

#### **Topic:** Database Design for a Restaurant Management System

#### **A person in a chef's hat and apron holding a bowl of food Description automatically generated**

**Introduction:** The restaurant industry is a dynamic and fast-paced sector that relies heavily on efficient management and customer satisfaction. Our group has chosen to focus on developing a comprehensive database system for a restaurant. With a shared passion for the culinary world and a recognition of the challenges faced by modern restaurants, we believe that implementing an effective database solution is crucial for streamlining operations and enhancing the overall dining experience.

#### **Problem Statement:** In the restaurant industry, there exists a pressing need for a robust software application and data storage system to address the complexities of managing orders, inventory, customer interactions, and overall business operations. A well-designed database is essential to ensure accurate and real-time data management, improve decision-making processes, and enhance the overall efficiency of restaurant operations.

#### **Solution:** Our team aims to construct a robust database system tailored explicitly for restaurant management. By meticulously designing and implementing a database, we intend to create an integrated platform that centralizes data on orders, dishes, ingredients, customer interactions, and staff activities. This system will facilitate efficient order processing, inventory management, and personalized customer service.

#### 

#### **Requirements:**

1. **Order Tracking:** Keep a record of customer orders, including items, quantities, timestamps, and status (e.g., pending, preparing, delivered).
2. **Reviews:** Allow customers to rate and review dishes, providing feedback on taste, presentation, and overall satisfaction.
3. **Chef Information:** Maintain a database of chefs with details like names, specialties, and contact information.
4. **Dish Catalog:** Create a catalog with essential dish information, such as name, description, price, and cuisine type.
5. **Inventory Tracking:** Monitor ingredient levels to manage stock, identify shortages, and ensure a consistent supply.
6. **Sales Report:** Generate a daily report summarizing the total revenue from sales, aiding in financial analysis.
7. **Popular Dishes Report:** Identify and report the most frequently ordered dishes, helping in inventory planning and promotions.
8. **Order History:** Record past customer orders, enabling personalized service, reordering, and customer preference analysis.

The Business rules for a restaurant are as follows:

* Customer can order multiple dishes, and each dish can be ordered by multiple customers.
* A customer can have multiple orders but may not have any order at all.
* Each order is associated with exactly one customer.
* A customer can give zero or many reviews, and each review is given by one and only one customer.
* A chef can cook many dishes.
* Each dish is cooked by one chef.
* A dish is made of many ingredients.
* Each ingredient is used in zero or many dishes.
* Each dish belongs to one cuisine, and under one cuisine, there are many dishes.

**ENTITY RELATIONSHIP DIAGRAM**

**A diagram of a computer

Description automatically generated**

**DATA DICTIONARY**

**Table: Customer**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size/Precision** | **Default** | **PK/FK** | **Required** | **Range** | **Sample Data** | **Notes** |
| **Customer ID** | Int | 4 |  | PK | Yes | 1-9999 | 1234 | Identity |
| **FirstName** | Varchar | 50 |  |  | Yes |  | “John” |  |
| **LastName** | Varchar | 50 |  |  | No |  | “Cena” |  |
| **Email** | Varchar | 255 |  |  | No |  | “johncena18@abc.com” |  |

**Table: Order**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size/Precision** | **Default** | **PK/FK** | **Required** | **Range** | **Sample Data** | **Notes** |
| **OrderID** | INT | 4 |  | PK | Yes | 1-9999 |  | Identity |
| **CustomerID** | INT | 4 |  | FK | Yes | 1-9999 |  | Identity |
| **OrderDate** | INT | 8 |  |  | No |  | 27/11/2023 | Date on Order |
| **TotalAmount** | DECIMALL | (10,2) | 0.00 |  | No |  |  |  |

**Table: Ingredient**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size/Precision** | **Default** | **PK/FK** | **Required** | **Range** | **Sample Data** | **Notes** |
| **IngredientID** | Int | 4 |  | PK | Yes | 1-9999 | 5678 | Identity |
| **Name** | Varchar | 50 |  |  | Yes |  | Baking Powder |  |
| **Unit** | Varchar | 20 | 1g |  |  |  |  | Measuring unit |

**Table: Cuisine**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size/Precision** | **Default** | **PK/FK** | **Required** | **Range** | **Sample Data** | **Notes** |
| **CuisineID** | Int | 4 |  | PK | Yes | 1-9999 | 6789 | Identity |
| **CuisineName** | Varchar | 50 |  |  | Yes | Asian |  |  |

**Table: Review**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size/Precision** | **Default** | **PK/FK** | **Required** | **Range** | **Sample Data** | **Notes** |
| **ReviewID** | Int | 4 |  | PK | Yes | 1-9999 | 2345 | Identity |
| **CustomerID** | Int | 4 |  | FK | Yes | 1-9999 | 1234 | Identity |
| **Rating** | Int | 5 |  |  | No |  | 5 |  |
| **Comment** | Varchar | 1000 |  |  | No |  | “Incredible, keep it up” |  |
| **ReviewDate** | Int | 8 |  |  | No |  | 27/11/2023 |  |

**Table: Dish**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size/Precision** | **Default** | **PK/FK** | **Required** | **Range** | **Sample Data** | **Notes** |
| **DishID** | NUMBER | 6 |  | PK | Y | 1000-9999 | 1234 | Auto numbered identity |
| **Title** | VARCHAR | 100 |  |  | Y |  | “Spaghetti Bolognese” |  |
| **ChefID** | NUMBER | 6 |  | FK | Y |  | 5678 | Foreign Key linked to Chefs table |
| **Instructions** | CLOB |  |  |  | Y |  | “Step by Step instructions” |  |
| **Rating** | NUMBER | 1 | 0 |  | N | 0-5 | 4 |  |

**Table: Chef**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size/Precision** | **Default** | **PK/FK** | **Required** | **Range** | **Sample Data** | **Notes** |
| **ChefID** | NUMBER | 4 |  | PK | Yes | 1-9999 | 1234 | Identity |
| **ChefName** | STRING | 50 |  |  | Yes |  | “Nick Jonas” | Authorized Name |
| **Email** | STRING | 255 |  |  | Yes |  | “Nickjonas@myseneca.ca” |  |
| **Username** | STRING | 255 |  |  | Yes |  | “NickJonas” |  |
| **Password** | STRING | 10 |  |  | Yes |  | #### |  |
| **Phone** | NUMBER | 10 |  |  | No |  | 123456789 |  |
| **Address** | STRING | 1000 |  |  | No |  | Unit 55 Corfu Road |  |

**Table: DishIngredient (Bridge Table)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size/Precision** | **Default** | **PK/FK** | **Required** | **Range** | **Sample Data** | **Notes** |
| **DishIngredientID** | Int | 4 |  | PK | yes | 1-9999 | 1234 | Identity |
| **DishID** | Int | 4 |  | FK | yes | 1-9999 | 1234 | Identity |
| **IngredientID** | Int | 4 |  | FK | yes |  | 1234 | Identity |

**Table: CustomerDish (Bridge table)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Column** | **Data Type** | **Size/Precision** | **Default** | **PK/FK** | **Required** | **Range** | **Sample Data** | **Notes** |
| **CustomerDishID** | Int | 4 |  | PK | Yes | 1-9999 | 1234 | Identity |
| **CustomerID** | Int | 4 |  | FK | Yes | 1-9999 | 1234 | Identity |
| **DishID** | Int | 4 |  | FK | Yes | 1-9999 | 1234 | Identity |