PROJECT TITLE : FOOD WASTAGE MANAGEMENT SYSTEM

**Project Description**

The Database Management component of the Food Wastage Reduction Management System (FWRMS) is designed to efficiently store, manage, and retrieve data related to food donations and distribution. This critical subsystem will handle the relational data needed for effective user management, food item tracking, donation histories, and reporting, ensuring the seamless operation of the entire platform.

**Data Dictionary for Food Wastage Reduction Management System (FWRMS)**

**1. Users Table**

| **Column Name** | **Data Type** | **Description** |
| --- | --- | --- |
| user\_id | INT | Unique identifier for each user (Primary Key). |
| username | VARCHAR(50) | The unique username of the user. |
| email | VARCHAR(100) | User's email address (must be unique). |
| password\_hash | VARCHAR(255) | Hashed password for user authentication. |
| role | ENUM('donor', 'collector', 'admin') | Role of the user in the system. |
| created\_at | DATETIME | Timestamp when the user account was created. |
| updated\_at | DATETIME | Timestamp of the last update to the user account. |

**2. Food Items Table**

| **Column Name** | **Data Type** | **Description** |
| --- | --- | --- |
| food\_item\_id | INT | Unique identifier for each food item (Primary Key). |
| donor\_id | INT | Foreign key referencing the user\_id of the donor. |
| food\_type | VARCHAR(100) | Type of food item (e.g., fruits, vegetables, baked goods). |
| quantity | INT | Quantity of the food item available for donation. |
| expiration\_date | DATE | Expiration date of the food item. |
| created\_at | DATETIME | Timestamp when the food item was listed. |
| updated\_at | DATETIME | Timestamp of the last update to the food item listing. |

**3. Donations Table**

| **Column Name** | **Data Type** | **Description** |
| --- | --- | --- |
| donation\_id | INT | Unique identifier for each donation (Primary Key). |
| food\_item\_id | INT | Foreign key referencing the food\_item\_id of the donated food. |
| donor\_id | INT | Foreign key referencing the user\_id of the donor. |
| collector\_id | INT | Foreign key referencing the user\_id of the collector (if applicable). |
| donation\_status | ENUM('pending', 'collected') | Status of the donation. |
| created\_at | DATETIME | Timestamp when the donation was made. |
| updated\_at | DATETIME | Timestamp of the last update to the donation record. |

**4. Collection Events Table**

| **Column Name** | **Data Type** | **Description** |
| --- | --- | --- |
| event\_id | INT | Unique identifier for each collection event (Primary Key). |
| collector\_id | INT | Foreign key referencing the user\_id of the collector. |
| food\_item\_id | INT | Foreign key referencing food\_item\_id denoting the food collected. |
| event\_date | DATETIME | Date and time of the collection event. |
| details | TEXT | Additional details about the collection event. |
| created\_at | DATETIME | Timestamp when the collection event was created. |
| updated\_at | DATETIME | Timestamp of the last update to the collection event record. |

Entity Relationship Diagram (ERD) for the Food Wastage Reduction Management System:

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| Users |

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| UserID (PK) |

| Username |

| Email |

| Role |

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| FoodItems |

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| FoodItemID (PK) |

| FoodName |

| ExpirationDate |

| Quantity |

| DonorUserID (FK) |

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| Donations |

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| DonationID (PK) |

| FoodItemID (FK) |

| DonorUserID (FK) |

| DateDonated |

| Status |

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| Collectors |

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| CollectorID (PK) |

| CollectorName |

| ContactInfo |

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| CollectEvents |

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| CollectEventID (PK)|

| DonationID (FK) |

| CollectorID (FK) |

| DateCollected |

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Logical Data Model (LDM) for the Food Wastage Reduction Management System:

**Entity 1: Users**

* Attribute 1.1: UserID (PK)
  + Description: A unique identifier for each user.
  + Data Type: Integer
* Attribute 1.2: Username
  + Description: The username chosen by each user.
  + Data Type: Varchar (50)
* Attribute 1.3: Email
  + Description: The email address of each user.
  + Data Type: Varchar (100)
* Attribute 1.4: Role
  + Description: The role of each user (e.g., donor, collector, admin).
  + Data Type: Enum (Donor, Collector, Admin)

**Entity 2: FoodItems**

* Attribute 2.1: FoodItemID (PK)
  + Description: A unique identifier for each food item.
  + Data Type: Integer
* Attribute 2.2: FoodName
  + Description: The name of each food item.
  + Data Type: Varchar (100)
* Attribute 2.3: ExpirationDate
  + Description: The expiration date of each food item.
  + Data Type: Date
* Attribute 2.4: Quantity
  + Description: The quantity of each food item.
  + Data Type: Integer
* Attribute 2.5: DonorUserID (FK)
  + Description: The user ID of the donor for each food item.
  + Data Type: Integer

**Entity 3: Donations**

* Attribute 3.1: DonationID (PK)
  + Description: A unique identifier for each donation.
  + Data Type: Integer
* Attribute 3.2: FoodItemID (FK)
  + Description: The food item ID of each donation.
  + Data Type: Integer
* Attribute 3.3: DonorUserID (FK)
  + Description: The user ID of the donor for each donation.
  + Data Type: Integer
* Attribute 3.4: DateDonated
  + Description: The date when each donation was made.
  + Data Type: Date
* Attribute 3.5: Status
  + Description: The status of each donation (e.g., pending, collected).
  + Data Type: Enum (Pending, Collected)

**Entity 4: Collectors**

* Attribute 4.1: CollectorID (PK)
  + Description: A unique identifier for each collector.
  + Data Type: Integer
* Attribute 4.2: CollectorName
  + Description: The name of each collector.
  + Data Type: Varchar (100)
* Attribute 4.3: ContactInfo
  + Description: The contact information of each collector.
  + Data Type: Varchar (100)

**Entity 5: CollectEvents**

* Attribute 5.1: CollectEventID (PK)
  + Description: A unique identifier for each collection event.
  + Data Type: Integer
* Attribute 5.2: DonationID (FK)
  + Description: The donation ID of each collection event.
  + Data Type: Integer
* Attribute 5.3: CollectorID (FK)
  + Description: The collector ID of each collection event.
  + Data Type: Integer
* Attribute 5.4: DateCollected
  + Description: The date when each collection event was made.
  + Data Type: Date
* Not Null constraints on required attributes (e.g., Username, FoodName)

Physical Database Model (PDM) For the Food Wastage Reduction Management System:

SQL representations create the tables and define their structures:

CREATE TABLE Users (

UserID INT PRIMARY KEY AUTO\_INCREMENT,

Username VARCHAR(50) NOT NULL UNIQUE,

Email VARCHAR(100) NOT NULL UNIQUE,

Role ENUM('Donor', 'Collector', 'Admin') NOT NULL

);

*Table: FoodItems*

CREATE TABLE FoodItems (

FoodItemID INT PRIMARY KEY AUTO\_INCREMENT,

FoodName VARCHAR(100) NOT NULL,

ExpirationDate DATE NOT NULL,

Quantity INT NOT NULL CHECK (Quantity >= 0),

DonorUserID INT,

FOREIGN KEY (DonorUserID) REFERENCES Users(UserID) ON DELETE SET NULL

);

*Table: Donations*

CREATE TABLE Donations (

DonationID INT PRIMARY KEY AUTO\_INCREMENT,

FoodItemID INT,

DonorUserID INT,

DateDonated DATE NOT NULL,

Status ENUM('Pending', 'Collected') NOT NULL,

FOREIGN KEY (FoodItemID) REFERENCES FoodItems(FoodItemID) ON DELETE CASCADE,

FOREIGN KEY (DonorUserID) REFERENCES Users(UserID) ON DELETE SET NULL

);

*Table: Collectors*

CREATE TABLE Collectors (

CollectorID INT PRIMARY KEY AUTO\_INCREMENT,

CollectorName VARCHAR(100) NOT NULL,

ContactInfo VARCHAR(100) NOT NULL

);

*Table: CollectEvents*

CREATE TABLE CollectEvents (

CollectEventID INT PRIMARY KEY AUTO\_INCREMENT,

DonationID INT,

CollectorID INT,

DateCollected DATE NOT NULL,

FOREIGN KEY (DonationID) REFERENCES Donations(DonationID) ON DELETE CASCADE,

FOREIGN KEY (CollectorID) REFERENCES Collectors(CollectorID) ON DELETE SET NULL

);