**##4. Requirement Analysis**

**4.1 Functional Requirements**

1. **User Registration and Authentication**
   * Donors (restaurants, supermarkets, individuals) can register, log in, and post food donation details.
   * Recipients (NGOs, shelters) can register, log in, and request food.
2. **Food Donation Management**
   * Donors can post details of surplus food, including quantity, type, and expiration date.
   * Real-time updates on food availability.
3. **Recipient Management**
   * Recipients can view available food donations.
   * Place requests based on food type and quantity.
4. **Pickup and Delivery Scheduling**
   * Automated or manual scheduling of pickups from donors.
   * Delivery to registered recipients based on location and need.
5. **Real-time Notifications**
   * Notify users about the status of donations, pickups, and deliveries.
6. **Analytics and Reporting**
   * Insights into food waste reduction, donation patterns, and recipient satisfaction.
7. **Health and Safety Compliance**
   * Mandatory checks for food quality.
   * Expiration tracking to avoid unsafe food distribution.
8. **Geolocation and Mapping**
   * Locate nearby donors and recipients.
   * Optimize pickup and delivery routes.

**4.2 Non-Functional Requirements**

1. **Scalability**
   * Ability to handle a large number of users and transactions.
2. **Security**
   * Secure user data and transactions with encryption and authentication mechanisms.
3. **Performance**
   * Real-time response for matching donors and recipients.
4. **Availability**
   * High availability to ensure uninterrupted service.
5. **Usability**
   * User-friendly interface for all stakeholders.

**##5. System Analysis**

**5.1 Stakeholders**

1. **Donors**  
   Restaurants, supermarkets, households, and event organizers contributing surplus food.
2. **Recipients**  
   NGOs, food banks, and shelters receiving food donations.
3. **Platform Administrators**  
   Oversee operations, ensure compliance, and resolve disputes.
4. **Logistics Partners**  
   Transport food from donors to recipients.

**5.2 Key Challenges**

1. Ensuring timely pickup and delivery to avoid spoilage.
2. Verifying food safety and quality.
3. Efficiently matching donors and recipients.

**5.3 Proposed System Features**

* Centralized database for donor and recipient information.
* Web-based application for ease of use.
* AI-powered matching system for donor-recipient pairing.

Integrated logistics module for pickup and delivery