Project Title: Convenience Store Customer Loyalty and Rewards System

Overview:

KickMart, a convenience store chain located in an urban setting, offers everyday essentials like snacks, drinks, toiletries, and more. Despite having a steady flow of customers due to its strategic location, KickMart is struggling to retain repeat customers. Many customers shop at KickMart occasionally but don't seem to return regularly. The store currently offers discounts sporadically, but there's no structured reward program in place to create loyalty. To boost customer retention, increase average transaction values, and gather valuable customer insights, KickMart decides to implement a **loyalty and reward system** using a custom software solution.

Problem:

KickMart faces several challenges:

1. **Low Customer Retention**: Many customers only make occasional purchases and aren't motivated to return frequently.
2. **Lack of Personalized Experience**: There are no systems in place to track individual customer preferences, so promotions feel generic and often miss the mark.
3. **No Data on Customer Behavior**: The store has no clear understanding of what its customers buy most frequently, making it difficult to plan targeted offers.
4. **Unawareness of Promotions**: Customers may not be aware of promotions or rewards available, and the store lacks an effective way to communicate these deals.

Solution:

The project aims to develop a **Customer Loyalty and Rewards System** for KickMart. The system will encourage customer retention by offering personalized rewards based on purchase history, providing incentives to frequent shoppers, and enhancing the overall customer experience. The system will include mobile app integration, real-time transaction tracking, personalized offers, and seamless redemption of rewards.

Key Stakeholders:

- **Store Owner/Manager:** Wants to increase customer retention and sales.
- **Marketing Team:** Will use customer data to create targeted promotions.
- **Customers:** The end-users who will benefit from loyalty points and rewards.
- **IT Department:** Responsible for system integration and maintenance.
- **Data Analytics Team:** Will analyze customer behavior and sales trends to optimize reward offers.

Primary Goals:

1. **Customer Loyalty Program:** Enable customers to earn points based on purchases and redeem them for rewards (e.g., discounts, free products).
2. **Personalized Offers:** Provide customers with customized promotions based on their purchase history and preferences.
3. **Real-Time Transaction Tracking:** Update loyalty points and offer statuses in real-time as customers make purchases.
4. **Mobile App Integration:** Allow customers to track their points and redeem rewards via a mobile app.
5. **Analytics & Reporting:** Analyze customer behavior to optimize reward offerings and marketing campaigns.

Scenario: Loyalty Points Accumulation and Reward Redemption

- **Actors:**
    - Customer
    - Store Employee (Cashier)
    - Loyalty System
    - Mobile App
    - Payment Gateway
- **Preconditions:**
    - The customer has an active account in the loyalty program.
    - The store's point-of-sale (POS) system is integrated with the loyalty system.
    - The customer has linked their loyalty account to the mobile app.
- **Main Flow:**

1. The customer enters the convenience store and picks up items for purchase.
2. The customer proceeds to checkout where the cashier scans the items.
3. The cashier inputs the customer's loyalty account number, or the customer scans their **QR code** from the mobile app at the POS.
4. The POS system communicates with the loyalty system to check the customer's account.
5. Based on the total purchase amount, the system calculates the loyalty points earned (e.g., 1 point per dollar spent).

6. The customer is informed about the accumulated points via the POS screen and mobile app.

7. If the customer has sufficient points, they are presented with options to **redeem** points for discounts, free products, or other rewards.

8. If the customer decides to redeem points:

    - The system deducts the corresponding points from the customer's account.
    - The system adjusts the total purchase price to reflect the discount or reward redemption.

9. The customer completes the payment, and the updated points balance is displayed on the POS screen and synced with the mobile app.

10. A receipt is printed that shows the loyalty points earned, used, and remaining balance.

- **Alternative Flows:**
    - **Insufficient Points for Redemption:** If the customer does not have enough points for a desired reward, the system will prompt the cashier or mobile app with an error message and suggest ways to earn more points.
    - **Manual Points Adjustment:** If the system detects a transaction error (e.g., points not added properly), the store manager can manually adjust the points through the admin interface.
    - **Points Expiry Notification:** If the customer has accumulated points close to expiry, the system will notify the customer through the app or at checkout.
- **Postconditions:**
    - The customer's loyalty points are updated in real-time.
    - The transaction is processed with any applicable discounts or rewards.
    - The updated points balance is synchronized with the mobile app.
    - A loyalty reward redemption record is stored for future analysis.

Tech Stack:

1. **Frontend:**
    - Web: React.js or Angular for building the responsive UI
    - Mobile: React Native or Flutter (for both iOS and Android)
    - HTML/CSS for design and structure
        - **Mobile App:** A cross-platform mobile application for iOS and Android (e.g., React Native or Flutter). The app allows customers to:

1. View their loyalty points balance.
2. Check available rewards.
3. Receive personalized offers.
4. Redeem points for rewards at checkout.

- **POS Interface:** The Point-of-Sale system where cashiers can scan loyalty cards/QR codes and process point-based transactions.

2. **Backend:**
    - **Database:** A relational database (e.g., PostgreSQL or MySQL) to store customer profiles, transaction history, loyalty points, and reward information.
        - Node.js with Express.js (for API management and handling requests)
        - Django (Python) for secure handling of medical data and regulatory compliance
        - Java (Spring Boot) for robust server-side development
    - **API Layer:** A set of RESTful APIs to handle communication between the mobile app, POS system, and the backend. The APIs allow the system to:
        - Check and update loyalty points.
        - Apply discounts or rewards.
        - Sync transaction data in real-time.
    - **Payment Gateway Integration:** Integration with payment providers (e.g., GCash, Square) to handle payments while applying discounts or rewards from the loyalty points.
3. **Real-Time Processing:**
    - **Message Queues:** Kafka can be used for real-time transaction updates across the mobile app and POS systems.
    - **Push Notifications:** When points are earned, redeemed, or rewards are about to expire, the app will send notifications to keep customers engaged.
4. **Analytics & Reporting:**
    - **Data Analytics:** Analyze customer spending behavior, purchase frequency, and reward redemption patterns to optimize reward offerings and marketing strategies. Tools like Google Analytics or custom data processing with Python and Pandas can be used.
    - **Reporting Dashboard:** A web-based dashboard for the marketing and management team to view sales trends, customer loyalty statistics, and the effectiveness of promotions.
5. **Security & Privacy:**

- **Encryption:** SSL encryption for all data transfers, especially when handling customer personal data or payment details.
- **Authentication:** Two-factor authentication (2FA) or OAuth for customers to access their loyalty accounts securely via the mobile app.

6. **Cloud Hosting & Deployment**
    - Azure for hosting the system
    - Docker & Kubernetes for containerization and orchestration to scale based on traffic demand
    - CI/CD pipelines for continuous integration and deployment

---

Expected Outcomes:

- **Increased Customer Retention:** The loyalty program encourages repeat visits by rewarding frequent customers.
- **Higher Customer Lifetime Value (CLV):** Customers are more likely to spend more to earn and redeem rewards.
- **Better Marketing Targeting:** Insights into purchasing patterns help tailor promotions and offers to specific customer segments.
- **Improved Customer Experience:** Seamless reward redemption, personalized offers, and mobile engagement enhance customer satisfaction.
