

Capstone Project

Reward Redemption Application (CES Portal)

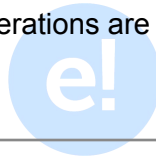
1. Overview

This capstone project simulates a real-world **bank reward redemption system** used internally by Customer Executive Support (CES) users. The application manages customers, credit cards, transactions, reward points, and reward redemption.

Technology Stack

- Frontend: Angular
- Backend: Spring Boot
- Database: MySQL

There is **no customer-facing UI**. All operations are performed by CES users on behalf of customers.



2. User Roles

2.1 Admin CES (Super CES)

- Can perform all CES actions
- Can create CES users
- Can delete CES users
- Cannot delete himself

2.2 CES User

- Manages customers
- Manages credit cards
- Generates and processes transactions
- Calculates and redeems reward points

3. Core Business Rules

- One customer can have **multiple credit cards**
 - Transactions are generated **per credit card**
 - Transaction amount range: **₹500 – ₹50,000**
 - Exactly **50 transactions** are generated per request
 - Customer types:
 - Regular: associated with bank < 3 years
 - Premium: associated with bank ≥ 3 years
 - Reward calculation:
 - Regular customer: **5% reward points**
 - Premium customer: **10% reward points**
 - Reward points **never expire**
 - Redemption rules:
 - Redemption is allowed **only from cart**
 - All items in cart must be redeemed together
 - Partial redemption is not allowed
 - **Negative reward balance is strictly not allowed**
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4. Functional Scope (User Stories)

EPIC 1: Authentication & Authorization

- Login for Admin CES and CES users
- JWT-based authentication
- Role-based access control

EPIC 2: CES User Management (Admin CES Only)

- Create CES users
- Delete CES users

EPIC 3: Customer Management

- Create customer
- Auto-calculate customer type based on how long there have been associated
- Soft delete customer
- View customer list with pagination
- Search customer by name or credit card number

EPIC 4: Credit Card Management

- Add multiple credit cards to a customer
- Ensure card number uniqueness

EPIC 5: Transaction Management

- Generate random transactions per credit card
- View transactions card-wise

EPIC 6: Reward Processing

- Process transactions only once
- Calculate reward points based on customer type
- Associate reward points with customer profile

EPIC 7: Reward Catalog & Redemption

- View reward categories
- View reward items with cost
- Add reward items to cart
- Redeem reward points (cart-only)
- Maintain redemption history

EPIC 8: Customer Profile

- View complete customer profile including:
 - Personal details
 - Credit cards
 - Transactions
 - Reward points
 - Redemption history



5. Reward Categories & Items

5.1 Gift Cards

- Google Play Gift Card – 5,000 points
- Apple Gift Card – 6,000 points
- Amazon Gift Card – 4,500 points
- Flipkart Gift Card – 4,500 points
- Swiggy Gift Card – 3,500 points
- Zomato Gift Card – 3,500 points

5.2 Travel & Holidays

- Trip to Manali – 40,000 points
- Trip to Kanyakumari – 30,000 points
- Goa Beach Holiday – 45,000 points
- Jaipur Heritage Trip – 28,000 points

- Ooty Hill Station Trip – 38,000 points

5.3 Shopping & Electronics

- Bluetooth Headphones – 12,000 points
- Smart Watch – 18,000 points
- Wireless Earbuds – 15,000 points
- Smartphone Voucher – 22,000 points
- Laptop Bag – 6,000 points

5.4 Dining & Lifestyle

- Dinner for Two – 8,000 points
- Café Voucher – 4,000 points
- Movie Tickets – 5,000 points
- Spa Voucher – 10,000 points

5.5 Health & Fitness

- Gym Membership (3 months) – 20,000 points
- Yoga Classes – 7,000 points
- Fitness Band – 9,000 points
- Nutrition Consultation – 6,000 points

5.6 Learning & Subscriptions

- Online Course Voucher – 10,000 points
- E-Book Subscription – 5,000 points
- Coding Platform Access – 12,000 points
- Music Subscription – 4,000 points



6. Non-Functional Requirements

- Secure APIs
- Input validation at backend
- Pagination for large data
- Transactional integrity during reward processing and redemption
- Proper exception handling and meaningful error responses

7. Learning Outcomes

By completing this project, learners will demonstrate:

- Real-world Angular application structure
- Spring Boot REST API design
- JWT authentication & authorization
- Entity relationships and ORM mappings
- Business rule implementation
- Transaction management
- End-to-end full stack integration

This project is designed to closely resemble real banking systems and prepares learners for industry-level full stack development.

