

Gift Card Management Platform using Mysql

Core Features:-

1. Gift Card Generation: Ability to generate unique gift cards with customizable initial balances and expiration dates. For this i have make a procedure name “**generate_gift_cards**” to generate a single card and “**bulk_generate_gift_cards**” to generate a bulk gift cards and after generating bulk gift card I have created another procedure name “**assign_gift_card_to_user**” which will help to assign card to the user_id.

2. Gift Card Redemption & Fraud Detection: Mechanism for redeeming gift cards, deducting the redeemed amount from the balance. For this i have make procedure name “**redeem_gift_card**”. While redeeming the gift card it will also simultaneously check that it is fraud transaction or not.

3. Balance Tracking: Real-time tracking and querying of gift card balances. For this I have make a table name “**gift_cards**” in which will help to check the real time balance.

4. Transaction Logging: Maintain a complete transaction history for each gift card, including redemptions and recharges. For this I have make a table name “**gift_card_transaction_table**”, this table will help us to maintain transaction of cards;

5. Gift Card Expiry & automatic expiry handling: Automatic handling of expired cards, preventing further usage. For this I have created a procedure name “**expire_gift_card**” which will help us to maintain records of expiry cards and it will also handle the automatic expiry.

6. User Association: Optionally associate gift cards with users (support both as signed and unassigned cards). This feature is included in the procedure name “**bulk_generate_gift_cards**” it will generate a bulk cards without assigning to the user and its status by default will be “**inactive**” to prevent wrong redemption of the card after generating bulk cards we can assign one of the card to the user.

7. Gift Card Status Management: Support for activating, deactivating, and blocking gift cards. For this I have created a procedure name “**update_gift_card_status**” which will help to manage the status of the cards like “**active**”, “**inactive**”, “**blocked**”, “**expired**”, which will help us to sort out the cards on the basis on its status.

8. Reporting:

Gift Card Summary:

- Total number of cards.
- Number of cards by status (active, inactive, blocked, expired).
- Total initial balance and total current balance (available funds).
- Cards per user.

Transaction Summary:

- Total transaction count by type (redemption, recharge, transfer_in, transfer_out).
- Total amounts per transaction type.
- Transactions by user or card.
- Transaction history per card.

Activity and Usage:

- Redemption amounts and frequency over time (daily, monthly).
- Recharge activity over time.
- Transfers between users.
- Expired cards count.

Bonus Features:-

Partial Redemption Support: Allow partial usage of gift card balance in multiple transactions. This feature is used in procedure name “**redeem_gift_card**” which checks if amount \leq current_balance.

Gift Card Recharge: Enable recharging of existing gift cards. This feature is used in procedure name “**recharge_gift_card**” which allows to make recharge .

Bulk Gift Card Generation: Efficiently generate multiple gift cards at once. This feature is used in procedure name “**bulk_generate_gift_cards**” to generate bulk gift card.

Gift Card Transfer: Allow transferring a gift card from one user to another. This feature is used in procedure name “**transfer_gift_card**” which allows to transfer card to another user_id.

Fraud Detection: Implement basic checks to detect and prevent suspicious activities. This feature is used in procedure name “**redeem_gift_card**” which redeem gift card as well as simultaneously also check fraud detection and unless the updated user_id doesn't match to the card the redemption doesn't occur.

Assigning Card: I have made an extra procedure name “**assign_gift_card_to_user**” which help us to assign card to the user from the bulk cards to save our time.

Source Code

First of all we create a Database name Gift Card Platform and we will use it

```
create database gift_card_platform;  
use gift_card_platform;
```

Then we will create a table of users,gift_cards,gift_card_transactions

■ User Table

```
CREATE TABLE users (  
  user_id INT unique AUTO_INCREMENT PRIMARY KEY,  
  username VARCHAR(100) UNIQUE NOT NULL,  
  email VARCHAR(255) UNIQUE NOT NULL,  
  created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP  
);
```

■ Gift card table

```
CREATE TABLE gift_cards (  
  card_id CHAR(7) PRIMARY KEY,  
  initial_balance DECIMAL(10,2) NOT NULL,  
  current_balance DECIMAL(10,2) NOT NULL,  
  expiration_date DATE NOT NULL,  
  status ENUM('active', 'inactive', 'blocked', 'expired') DEFAULT 'active',  
  user_id INT NULL,  
  created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP,  
  updated_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP,  
  CONSTRAINT fk_user FOREIGN KEY (user_id)  
    REFERENCES users(user_id)  
    ON DELETE SET NULL,  
  CHECK (current_balance >= 0)  
);
```

■ Transaction table to check redemption,recharge,transfer

```
CREATE TABLE gift_card_transactions (  
  transaction_id BIGINT AUTO_INCREMENT PRIMARY KEY,  
  card_id CHAR(7) NOT NULL,  
  user_id INT NULL,  
  transaction_type ENUM('redemption', 'recharge', 'transfer_out', 'transfer_in') NOT NULL,  
  amount DECIMAL(10,2) NOT NULL,  
  transaction_date TIMESTAMP DEFAULT CURRENT_TIMESTAMP,  
  notes VARCHAR(255),  
  CONSTRAINT fk_card FOREIGN KEY (card_id)  
    REFERENCES gift_cards(card_id)  
    ON DELETE CASCADE,  
  CONSTRAINT fk_user_tx FOREIGN KEY (user_id)  
    REFERENCES users(user_id)  
    ON DELETE SET NULL  
);
```

After creating table we will create a function and procedures

■ Function to generate unique card_id

```
DELIMITER //

CREATE FUNCTION generate_card_id()
RETURNS CHAR(7)
DETERMINISTIC
BEGIN
    DECLARE card CHAR(7);
    DECLARE done INT DEFAULT 0;

    REPEAT
        SET card = SUBSTRING(MD5(RAND()), 1, 7);
        -- Check if card exists
        IF (SELECT COUNT(*) FROM gift_cards WHERE card_id = card) = 0 THEN
            SET done = 1;
        END IF;
    UNTIL done = 1 END REPEAT;

    RETURN card;
END //
```

■ Generate single gift card

```
DELIMITER //

CREATE PROCEDURE generate_gift_card (
    IN init_balance DECIMAL(10,2),
    IN expiry DATE,
    IN associated_user INT,
    OUT out_card_id CHAR(7)
)
BEGIN
    DECLARE new_card CHAR(7);
    SET new_card = generate_card_id();

    INSERT INTO gift_cards(card_id, initial_balance, current_balance, expiration_date, user_id)
    VALUES (new_card, init_balance, init_balance, expiry, associated_user);

    SET out_card_id = new_card;
END //
```

■ Bulk Gift Card Generate

```
DELIMITER //

CREATE PROCEDURE bulk_generate_gift_cards (
    IN count INT,
```

```

    IN init_balance DECIMAL(10,2),
    IN expiry DATE,
    IN associated_user INT
)
BEGIN
    DECLARE i INT DEFAULT 0;
    DECLARE new_card CHAR(7);

    -- Validate input parameters
    IF count <= 0 THEN
        SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'Count must be a positive integer';
    END IF;

    IF init_balance <= 0 THEN
        SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'Initial balance must be positive';
    END IF;

    IF expiry <= CURDATE() THEN
        SIGNAL SQLSTATE '45000'
        SET MESSAGE_TEXT = 'Expiration date must be in the future';
    END IF;

    -- Start transaction for bulk operation
    START TRANSACTION;

    -- Generate the specified number of gift cards
    WHILE i < count DO
        SET new_card = generate_card_id();

        -- Insert with explicit 'inactive' status
        INSERT INTO gift_cards(
            card_id,
            initial_balance,
            current_balance,
            expiration_date,
            user_id,
            status
        )
        VALUES (
            new_card,
            init_balance,
            init_balance,
            expiry,
            associated_user,
            'inactive' -- Explicitly set status to inactive
        );

        SET i = i + 1;
    END WHILE;

```

```

COMMIT;

-- Return success message
SELECT CONCAT('Successfully generated ', count, ' inactive gift cards') AS message;
END //

DELIMITER ;

```

■ Redeem Gift Card

```

CREATE PROCEDURE redeem_gift_card (
  IN p_card_id CHAR(7),
  IN p_user_id INT,
  IN p_amount DECIMAL(10,2),
  OUT p_success BOOLEAN,
  OUT p_message VARCHAR(255)
)
BEGIN
  DECLARE v_balance DECIMAL(10,2);
  DECLARE v_status ENUM('active', 'inactive', 'blocked', 'expired');
  DECLARE v_expired BOOL;
  DECLARE v_user_id INT;

  proc_end: BEGIN
    -- Card existence and lock the row for concurrency safety
    SELECT current_balance, status, (expiration_date < CURDATE()), user_id
    INTO v_balance, v_status, v_expired, v_user_id
    FROM gift_cards
    WHERE card_id = p_card_id
    FOR UPDATE;

    -- If no row found (card doesn't exist)
    IF v_user_id IS NULL AND v_balance IS NULL THEN
      SET p_success = FALSE;
      SET p_message = 'Gift card not found';
      LEAVE proc_end;
    END IF;

    -- Check ownership: user must match assigned user_id
    IF v_user_id IS NULL OR v_user_id != p_user_id THEN
      SET p_success = FALSE;
      SET p_message = 'User does not own this gift card or card is unassigned';
      LEAVE proc_end;
    END IF;

    -- Update status if expired
    IF v_expired AND v_status != 'expired' THEN
      UPDATE gift_cards SET status = 'expired', updated_at = NOW() WHERE card_id = p_card_id;
      SET p_success = FALSE;
      SET p_message = 'Gift card is expired';
      LEAVE proc_end;
    END IF;
  END;

```

```

END IF;

-- Check card status
IF v_status != 'active' THEN
    SET p_success = FALSE;
    SET p_message = CONCAT('Gift card status is ', v_status);
    LEAVE proc_end;
END IF;

-- Balance check
IF v_balance < p_amount THEN
    SET p_success = FALSE;
    SET p_message = 'Insufficient balance';
    LEAVE proc_end;
END IF;

-- Basic fraud detection
IF p_amount > 1000 THEN
    SET p_success = FALSE;
    SET p_message = 'Transaction exceeds allowed limit';
    LEAVE proc_end;
END IF;

-- Update balance
UPDATE gift_cards
SET current_balance = current_balance - p_amount,
    updated_at = NOW()
WHERE card_id = p_card_id;

-- Log transaction
INSERT INTO gift_card_transactions(card_id, user_id, transaction_type, amount, notes)
VALUES (p_card_id, p_user_id, 'redemption', p_amount, 'Redemption');

SET p_success = TRUE;
SET p_message = 'Redemption successful';
END proc_end;
END //

DELIMITER ;

```

■ Recharge Gift Card

```

DELIMITER //

CREATE PROCEDURE recharge_gift_card (
    IN p_card_id CHAR(7),
    IN p_user_id INT,
    IN p_amount DECIMAL(10,2),
    OUT p_success BOOLEAN,
    OUT p_message VARCHAR(255)
)
BEGIN

```

```

DECLARE v_status ENUM('active', 'inactive', 'blocked', 'expired');

proc_end:Begin
-- Check if card exists
IF NOT EXISTS (SELECT 1 FROM gift_cards WHERE card_id = p_card_id) THEN
    SET p_success = FALSE;
    SET p_message = 'Gift card not found';
    LEAVE proc_end;
END IF;

SELECT status INTO v_status FROM gift_cards WHERE card_id = p_card_id;

IF v_status != 'active' THEN
    SET p_success = FALSE;
    SET p_message = CONCAT('Gift card status is ', v_status);
    LEAVE proc_end;
END IF;

IF p_amount <= 0 THEN
    SET p_success = FALSE;
    SET p_message = 'Recharge amount must be positive';
    LEAVE proc_end;
END IF;

-- Update balance
UPDATE gift_cards SET current_balance = current_balance + p_amount, updated_at = NOW()
WHERE card_id = p_card_id;

-- Log transaction
INSERT INTO gift_card_transactions(card_id, user_id, transaction_type, amount, notes)
VALUES (p_card_id, p_user_id, 'recharge', p_amount, 'Recharge');

SET p_success = TRUE;
SET p_message = 'Recharge successful';

End proc_end;
END //

DELIMITER ;

```

■ Automatic expiry Handling

```

DELIMITER //

CREATE PROCEDURE expire_gift_cards()
BEGIN
    UPDATE gift_cards
    SET status = 'expired', updated_at = NOW()
    WHERE expiration_date < CURDATE() AND status = 'active';
END //
DELIMITER ;

```


■ Redeem gift card & also Check for Fraud Detection

DELIMITER //

```
CREATE PROCEDURE redeem_gift_card (  
    IN p_card_id CHAR(7),  
    IN p_user_id INT,  
    IN p_amount DECIMAL(10,2),  
    OUT p_success BOOLEAN,  
    OUT p_message VARCHAR(255)  
)  
BEGIN  
    DECLARE v_balance DECIMAL(10,2);  
    DECLARE v_status ENUM('active', 'inactive', 'blocked', 'expired');  
    DECLARE v_expired BOOL;  
  
    proc_end: BEGIN  
        -- Card existence check  
        IF NOT EXISTS (SELECT 1 FROM gift_cards WHERE card_id = p_card_id) THEN  
            SET p_success = FALSE;  
            SET p_message = 'Gift card not found';  
            LEAVE proc_end;  
        END IF;  
  
        -- Fetch balance, status, and expiry status  
        SELECT current_balance, status, (expiration_date < CURDATE())  
        INTO v_balance, v_status, v_expired  
        FROM gift_cards  
        WHERE card_id = p_card_id;  
  
        -- Update status if expired  
        IF v_expired AND v_status != 'expired' THEN  
            UPDATE gift_cards SET status = 'expired' WHERE card_id = p_card_id;  
            SET p_success = FALSE;  
            SET p_message = 'Gift card is expired';  
            LEAVE proc_end;  
        END IF;  
  
        -- Check card status  
        IF v_status != 'active' THEN  
            SET p_success = FALSE;  
            SET p_message = CONCAT('Gift card status is ', v_status);  
            LEAVE proc_end;  
        END IF;  
  
        -- Balance check  
        IF v_balance < p_amount THEN  
            SET p_success = FALSE;  
            SET p_message = 'Insufficient balance';  
            LEAVE proc_end;  
        END IF;
```

```

-- Basic fraud detection
IF p_amount > 1000 THEN
    SET p_success = FALSE;
    SET p_message = 'Transaction exceeds allowed limit';
    LEAVE proc_end;
END IF;

-- Update balance
UPDATE gift_cards
SET current_balance = current_balance - p_amount,
    updated_at = NOW()
WHERE card_id = p_card_id;

-- Log transaction
INSERT INTO gift_card_transactions(card_id, user_id, transaction_type, amount, notes)
VALUES (p_card_id, p_user_id, 'redemption', p_amount, 'Redemption');

SET p_success = TRUE;
SET p_message = 'Redemption successful';
END proc_end;
END //

DELIMITER ;

```

■ Transfer Gift Card

```

DELIMITER //

CREATE PROCEDURE transfer_gift_card (
    IN p_card_id CHAR(7),
    IN p_from_user INT,
    IN p_to_user INT,
    OUT p_success BOOLEAN,
    OUT p_message VARCHAR(255)
)
BEGIN
    DECLARE v_current_user INT;
    DECLARE v_status ENUM('active', 'inactive', 'blocked', 'expired');

    proc_end:Begin
        -- Check if card exists and belongs to from_user
        SELECT user_id, status INTO v_current_user, v_status FROM gift_cards WHERE card_id =
        p_card_id;

        IF v_current_user IS NULL THEN
            SET p_success = FALSE;
            SET p_message = 'Gift card is unassigned and cannot be transferred';
            LEAVE proc_end;
        END IF;
    
```

```

IF v_current_user != p_from_user THEN
    SET p_success = FALSE;
    SET p_message = 'Gift card does not belong to the transferring user';
    LEAVE proc_end;
END IF;

IF v_status != 'active' THEN
    SET p_success = FALSE;
    SET p_message = CONCAT('Gift card status is ', v_status);
    LEAVE proc_end;
END IF;

-- Transfer card
UPDATE gift_cards SET user_id = p_to_user, updated_at = NOW() WHERE card_id = p_card_id;

-- Log transactions: transfer_out and transfer_in
INSERT INTO gift_card_transactions(card_id, user_id, transaction_type, amount, notes)
VALUES (p_card_id, p_from_user, 'transfer_out', 0, CONCAT('Transferred to user ', p_to_user));

INSERT INTO gift_card_transactions(card_id, user_id, transaction_type, amount, notes)
VALUES (p_card_id, p_to_user, 'transfer_in', 0, CONCAT('Received from user ', p_from_user));

SET p_success = TRUE;
SET p_message = 'Gift card transferred successfully';

End proc_end;
END //

DELIMITER ;

```

■ Status Management (Active,Expired,Inactive,Blocked)

```

DELIMITER //

CREATE PROCEDURE update_gift_card_status (
    IN p_card_id CHAR(7),
    IN p_new_status ENUM('active', 'inactive', 'blocked', 'expired'),
    OUT p_success BOOLEAN,
    OUT p_message VARCHAR(255)
)
BEGIN
    proc_end:Begin
    IF NOT EXISTS (SELECT 1 FROM gift_cards WHERE card_id = p_card_id) THEN
        SET p_success = FALSE;
        SET p_message = 'Gift card not found';
        LEAVE proc_end;
    END IF;

    UPDATE gift_cards SET status = p_new_status, updated_at = NOW() WHERE card_id = p_card_id;

```

```

SET p_success = TRUE;
SET p_message = CONCAT('Gift card status updated to ', p_new_status);

End proc_end;
END //

DELIMITER ;

```

■ Assign Gift Card to User

If we generate Bulk Cards then this procedure will help us to assign one of the card from Bulk Generated cards to the User.

```

DELIMITER //

CREATE PROCEDURE assign_gift_card_to_user (
  IN p_card_id CHAR(7),
  IN p_user_id INT
)
BEGIN
  UPDATE gift_cards
  SET user_id = p_user_id
  WHERE card_id = p_card_id;
END //
DELIMITER ;

```

■ Reporting

After Designing our database we will execute querries on it

To insert value into database:-

```
INSERT INTO users (username, email) VALUES ('John', 'John@example.com'),
('Joy', 'Joy@example.com'), ('Raju', 'Raju@example.com'),
('Mahesh', 'Mahesh@example.com');
```

```
select * from users;
```

	user_id	username	email	created_at
▶	1	John	John@example.com	2025-06-21 15:12:46
	2	Joy	Joy@example.com	2025-06-21 15:12:46
	3	Raju	Raju@example.com	2025-06-21 18:46:08
	4	Mahesh	Mahesh@example.com	2025-06-21 18:46:08

To generate a single gift card for specific user_id:-

```
call generate_gift_card(100.00, CURDATE() + INTERVAL 30 DAY, 1, @card_id);
```

	card_id	initial_balance	current_balance	expiration_date	status	user_id	created_at	updated_at
▶	60cfca3	100.00	100.00	2025-07-22	active	1	2025-06-22 16:13:54	2025-06-22 16:13:54

To generate a bulk card without assign to a user_id:-

```
call bulk_generate_gift_cards(4, 100.00, DATE_ADD(CURDATE(), INTERVAL 30 DAY),
NULL);
```

	card_id	initial_balance	current_balance	expiration_date	status	user_id	created_at	updated_at
▶	3060185	100.00	100.00	2025-07-22	inactive	NULL	2025-06-22 16:15:31	2025-06-22 16:15:31
	94b1c9e	100.00	100.00	2025-07-22	inactive	NULL	2025-06-22 16:15:31	2025-06-22 16:15:31
	d9a9892	100.00	100.00	2025-07-22	inactive	NULL	2025-06-22 16:15:31	2025-06-22 16:15:31
	e428b82	100.00	100.00	2025-07-22	inactive	NULL	2025-06-22 16:15:31	2025-06-22 16:15:31

To assign a specific card_id to a user_id:-

```
call assign_gift_card_to_user('3060185', 2);-- This query is applied for user_id 2
```

	card_id	initial_balance	current_balance	expiration_date	status	user_id	created_at	updated_at
▶	3060185	100.00	100.00	2025-07-22	inactive	2	2025-06-22 16:15:31	2025-06-22 16:22:39
	60cfca3	100.00	100.00	2025-07-22	active	1	2025-06-22 16:13:54	2025-06-22 16:13:54

To check total issued-cards:-

```
select COUNT(*) AS total_issued FROM gift_cards;
```

	total_issued
▶	5

To redeem card:-

call `redeem_gift_card('60cfca3',1,10,@success,@msg);` -- this query is applied for user id 1

	card_id	initial_balance	current_balance	expiration_date	status	user_id	created_at	updated_at
▶	3060185	100.00	100.00	2025-07-22	inactive	2	2025-06-22 16:15:31	2025-06-22 16:22:39
	60cfca3	100.00	90.00	2025-07-22	active	1	2025-06-22 16:13:54	2025-06-22 16:23:59

To check how many cards are generated and how many cards are assign to the user:-

-- First row is NULL of user_id because we generated a bulk cards without assign any user_id to it. The below screenshot means we have generated total 5 cards 2 cards assigned to the specific user_id and 3 remaining to assign.

`select user_id, COUNT(*) AS cards_count FROM gift_cards GROUP BY user_id;`

	user_id	cards_count
▶	NULL	3
	1	1
	2	1

To check number of active_cards:

`select COUNT(*) AS active_cards FROM gift_cards WHERE status = 'active';`

	active_cards
▶	1

To check expired_cards:-

`select COUNT(*) AS expired_cards FROM gift_cards WHERE status = 'expired';`

	expired_cards
▶	0

To check inactive_cards:-

`select count(*) as inactive_cards from gift_cards where status = 'inactive';`

	inactive_cards
▶	4

To transfer one card_id to another user_id:

call `transfer_gift_card('60cfca3', 1, 3, @success, @msg);`-- Here card of user_id 1 is transfer to user_id 3

	card_id	initial_balance	current_balance	expiration_date	status	user_id	created_at	updated_at
▶	60cfca3	100.00	90.00	2025-07-22	active	3	2025-06-22 16:13:54	2025-06-22 16:28:39
	3060185	100.00	100.00	2025-07-22	inactive	2	2025-06-22 16:15:31	2025-06-22 16:22:39

```
call recharge_gift_card('60cfca3', 3, 100.00, @success, @message);
```

	card_id	initial_balance	current_balance	expiration_date	status	user_id	created_at	updated_at
▶	60cfa3	100.00	190.00	2025-07-22	active	3	2025-06-22 16:13:54	2025-06-22 16:30:49
	3060185	100.00	100.00	2025-07-22	inactive	2	2025-06-22 16:15:31	2025-06-22 16:22:39

```
call update_gift_card_status('3060185','active',@success,@msg);
```

	card_id	initial_balance	current_balance	expiration_date	status	user_id	created_at	updated_at
▶	60cfa3	100.00	190.00	2025-07-22	active	3	2025-06-22 16:13:54	2025-06-22 16:32:42
	3060185	100.00	100.00	2025-07-22	active	2	2025-06-22 16:15:31	2025-06-22 16:33:05

-- If we try to recharge card like (blocked,expired,inactive) then it will not work it will give message like. Here first i change status to inactive then i run this query.

```
call recharge_gift_card('3060185', 2, 100.00, @success, @message);
select @success, @message; -- After running this it will show message.
```

	@succes	@message
▶	NULL	Gift card is inactive

```
select IFNULL(SUM(amount),0) AS total_redeemed FROM gift_card_transactions WHERE
transaction_type = 'redemption';
```

	total_redeemed
▶	10.00

```
select * from gift_cards where current_balance > 100;
```

[illegible]

```
select * from gift_cards where current_balance = 100;
```

[illegible]

```
select * from gift_card_transactions;
```

[illegible]