Dasha Gore

December 20, 2024

CS 499

Lab one Enhancement

-- Enhanced SQL Code for Milestone Four

-- Add Security Features

CREATE USER 'app\_user'@'localhost' IDENTIFIED BY 'secure\_password';

GRANT SELECT, INSERT ON orders TO 'app\_user'@'localhost';

-- Users Table with Data Validation

CREATE TABLE users (

user\_id INT AUTO\_INCREMENT PRIMARY KEY,

name VARCHAR(100) NOT NULL,

email VARCHAR(100) NOT NULL UNIQUE,

created\_at TIMESTAMP DEFAULT CURRENT\_TIMESTAMP,

CONSTRAINT valid\_email CHECK (email REGEXP '^[A-Za-z0-9.\_%+-]+@[A-Za-z0-9.-]+\.[A-Za-z]{2,}$')

);

-- Orders Table with Foreign Key

CREATE TABLE orders (

order\_id INT AUTO\_INCREMENT PRIMARY KEY,

user\_id INT NOT NULL,

product\_name VARCHAR(100) NOT NULL,

order\_date DATE NOT NULL,

FOREIGN KEY (user\_id) REFERENCES users(user\_id)

);

-- Create Index for Performance Optimization

CREATE INDEX idx\_user\_id ON orders(user\_id);

-- Add Stored Procedure for Retrieving User Orders

DELIMITER //

CREATE PROCEDURE get\_user\_orders(IN userId INT)

BEGIN

SELECT \* FROM orders WHERE user\_id = userId;

END //

DELIMITER ;

-- Transaction Management for Order Creation

DELIMITER //

CREATE PROCEDURE create\_order(

IN p\_user\_id INT,

IN p\_product\_name VARCHAR(100)

)

BEGIN

DECLARE EXIT HANDLER FOR SQLEXCEPTION

BEGIN

ROLLBACK;

SIGNAL SQLSTATE '45000'

SET MESSAGE\_TEXT = 'Order creation failed';

END;

START TRANSACTION;

INSERT INTO orders (user\_id, product\_name, order\_date)

VALUES (p\_user\_id, p\_product\_name, CURRENT\_DATE);

COMMIT;

END //

DELIMITER ;

-- Audit Logging Table

CREATE TABLE audit\_log (

log\_id INT AUTO\_INCREMENT PRIMARY KEY,

action\_type VARCHAR(50),

table\_name VARCHAR(50),

record\_id INT,

action\_date TIMESTAMP DEFAULT CURRENT\_TIMESTAMP,

user\_action VARCHAR(100)

);

-- Trigger for Auditing Order Inserts

DELIMITER //

CREATE TRIGGER orders\_audit\_insert

AFTER INSERT ON orders

FOR EACH ROW

BEGIN

INSERT INTO audit\_log (action\_type, table\_name, record\_id, user\_action)

VALUES ('INSERT', 'orders', NEW.order\_id, 'New order created');

END //

DELIMITER ;

-- Query Example

SELECT

users.name,

users.email,

orders.product\_name,

orders.order\_date

FROM

users

INNER JOIN

orders

ON

users.user\_id = orders.user\_id

WHERE

orders.order\_date >= '2023-01-01';