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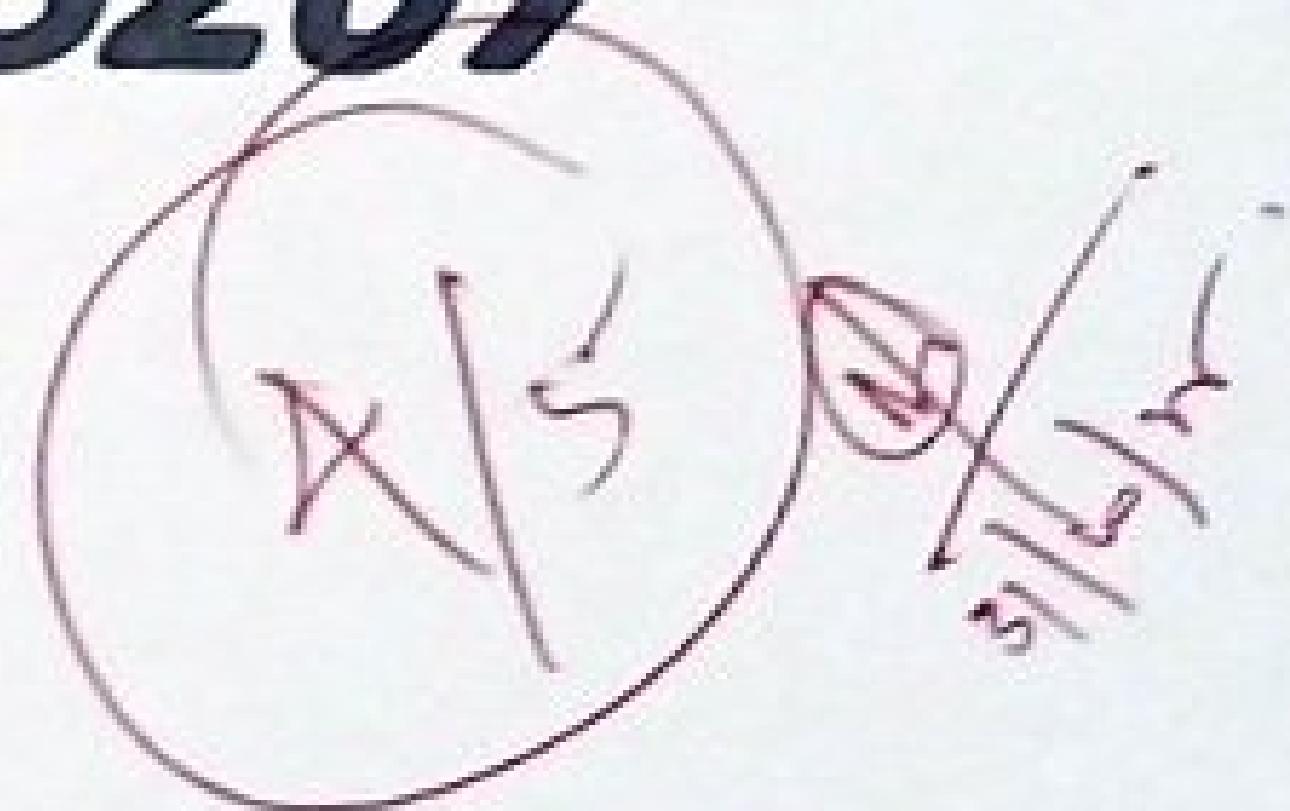
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**COURSE:DATA BASE MANAGEMENT
SYSTEM**

COURSE CODE: 10211 CS207

SLOT NO:S2 L5

ASSIGNMENT - 2



Gift Coupon Application Using MySQL

A detailed use case on ACID
compliance, scalability, and
normalization



Introduction

- A Gift Coupon Application is a digital platform enabling users to receive and redeem coupons.
- It ensures data integrity and transaction safety using a relational database system (MySQL).

Objective

- Design a relational database for managing gift coupons.
- Maintain ACID properties during all transactions.
- Prevent deadlocks and ensure data normalization up to 3NF.
- Achieve horizontal scalability using MySQL clustering.

System Overview

- User Interface: Customers view and redeem coupons.
- Application Server: Handles business logic and API requests.
- MySQL Database: Stores user, coupon, and transaction data.
- MySQL Cluster: Provides scalability and fault tolerance.

Why MySQL (Relational DB)

- Supports ACID transactions.
- Ensures strong consistency, unlike NoSQL systems.
- Offers replication and clustering for scalability.
- Well-suited for handling large volumes of transactional data.

ACID Properties

- Atomicity: All or none of a transaction is executed.
- Consistency: Database moves from one valid state to another.
- Isolation: Transactions execute independently.
- Durability: Committed transactions survive system failures.

Database Design

- Tables: Customer, Coupon, Transaction
- Relationships: Customer \leftrightarrow Transaction \leftrightarrow Coupon
- Normalization: Up to 3NF to remove redundancy.

Example SQL Schema

- CREATE TABLE Customer (...);
- CREATE TABLE Coupon (...);
- CREATE TABLE Transaction (...);
- All tables linked using Foreign Keys for referential integrity.

Transaction & Deadlock Management

- MySQL InnoDB engine ensures row-level locking.
- Deadlocks avoided using consistent query ordering.
- COMMIT and ROLLBACK maintain atomic operations.



Horizontal Scalability in MySQL Cluster

- MySQL Cluster distributes data across nodes.
 - Enables horizontal scaling for high read/write throughput.
 - Provides replication and fault tolerance.
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Conclusion

- The Gift Coupon Application using MySQL ensures reliability, scalability, and integrity.
 - Normalized schema and ACID compliance enable consistent transactions.
 - MySQL Cluster enhances performance under heavy load.
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