

Classroom Game: Transaction Chaos – Save the Database

Course Code: 23PCIT401

Course Name: Database Management System

Objective: Help students understand the ACID properties of database transactions (Atomicity, Consistency, Isolation, Durability) through an interactive classroom simulation.

Duration: 20–25 minutes

Class: Second Year Engineering

Materials Required

- 1 Transaction cards
- 2 Chaos event cards
- 3 Whiteboard or projector

Step 1: Form Teams

Divide the class into 4–5 teams. Each team represents a database management system. Each team assigns the following roles:

Role	Responsibility
Transaction Manager	Executes the transaction steps
Account Manager	Updates account balances
Log Manager	Maintains transaction log
Auditor	Checks consistency rules
Crash Controller	Handles event cards

Step 2: Initial Database State

Account	Balance
A	Rs 5000
B	Rs 3000
C	Rs 2000

Total money in system = Rs 10000. Teams must ensure this total never changes.

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Step 3: Transaction Cards

Card	Transaction
T1	Transfer Rs 1000 from A to B
T2	Transfer Rs 500 from B to C
T3	Withdraw Rs 700 from A
T4	Deposit Rs 900 into C
T5	Transfer Rs 300 from C to A
T6	Transfer Rs 800 from B to A

Step 4: Chaos Event Cards

Event	Situation	Concept Learned
System Crash	Crash occurs after deduction but before addition	Atomicity – rollback required
Dirty Read	Transaction reads uncommitted data	Isolation
Consistency Check	Auditor verifies total balance	Consistency
Power Failure	System crash after commit	Durability via logs

Step 5: Reflection Questions

- 1 What happened when the system crashed during the transaction?
- 2 Why is rollback necessary in DBMS?
- 3 What problems occur without isolation?
- 4 Why are logs important for durability?

ACID Properties Summary

Property	Meaning	Game Example
Atomicity	All or nothing transaction	Rollback during crash
Consistency	Database moves between valid states	Total money remains constant
Isolation	Transactions run independently	Avoid dirty reads
Durability	Committed data is permanent	Recovered using logs

Impact Analysis

The classroom game “Transaction Chaos – Save the Database” had a significant positive impact on student learning and engagement, as reflected in the feedback from 63 participants. A large majority of students found the activity interesting or very interesting, indicating high engagement levels, while approximately 95.2% confirmed that they understood the ACID properties of transactions more effectively through the game. The interactive and role-based approach helped students grasp abstract DBMS concepts in a practical and enjoyable manner, while also promoting teamwork, critical thinking, and problem-solving skills. Additionally, most students expressed interest in participating in similar activities in the future, highlighting the effectiveness of game-based learning. A small portion of neutral responses suggests minor scope for improvement in execution, but overall, the activity successfully enhanced both conceptual clarity and classroom participation.

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Photographs for the Activity

Feedback on Transaction chaos for DBMS 2025-26

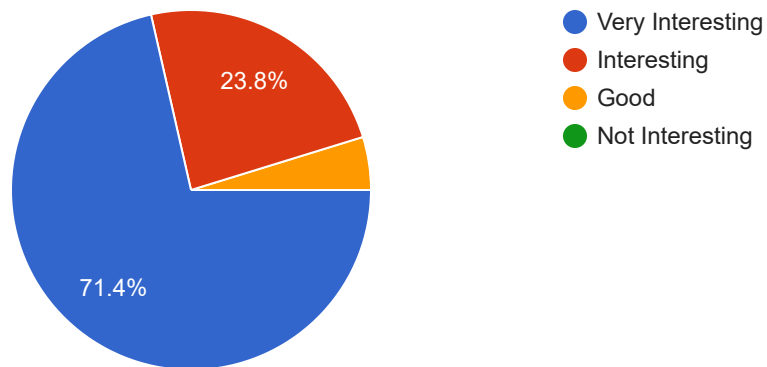
63 responses

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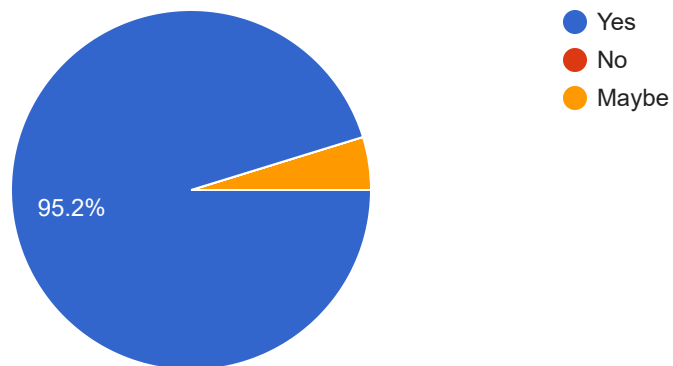
63 responses



Did you learn the ACID properties of transaction

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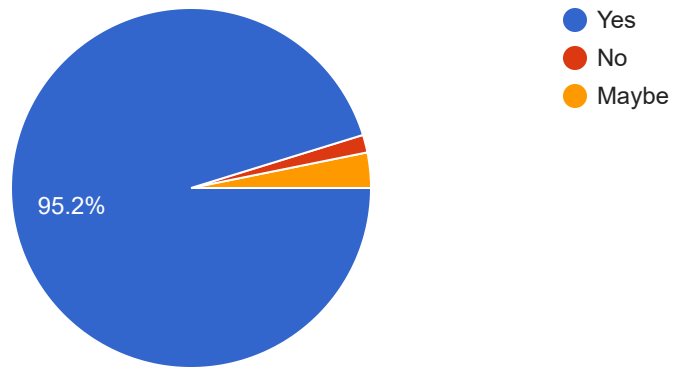
63 responses



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63 responses



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Transaction Chaos – Save the Database

- Classroom Game on ACID Properties
- Duration: 20–25 minutes
- Target: Second Year Engineering (DBMS)

Objective

- Understand ACID Properties:
 - - Atomicity
 - - Consistency
 - - Isolation
 - - Durability
- through interactive simulation

Materials Required

- - Transaction Cards
- - Chaos Event Cards
- - Whiteboard/Projector

Step 1: Form Teams

- Divide class into 4–5 teams
- Assign roles:
 - - Transaction Manager
 - - Account Manager
 - - Log Manager
 - - Auditor
 - - Crash Controller

Step 2: Initial Database State

- Account Balances:
- $A = ₹5000$
- $B = ₹3000$
- $C = ₹2000$

- Total = ₹10000 (must remain constant)

Step 3: Transaction Cards

- T1: $A \rightarrow B$ ₹1000
- T2: $B \rightarrow C$ ₹500
- T3: Withdraw ₹700 from A
- T4: Deposit ₹900 into C
- T5: $C \rightarrow A$ ₹300
- T6: $B \rightarrow A$ ₹800

Step 4: Chaos Event Cards

- System Crash → Rollback (Atomicity)
- Dirty Read → Isolation issue
- Consistency Check → Verify totals
- Power Failure → Durability using logs

Step 5: Scoring System

- Correct transaction: +5
- Correct rollback: +10
- Maintain consistency: +10
- Proper logging: +10
- Wrong decision: -5

Reflection Questions

- 1. What happens during system crash?
- 2. Why rollback is needed?
- 3. Issues without isolation?
- 4. Why logs are important?

ACID Summary

- Atomicity: All or nothing
- Consistency: Valid states
- Isolation: Independent execution
- Durability: Permanent changes