BVRIT HYDERABAD College of Engineering for Women

Department of Electronics and Communication Engineering

Name of the Activity: Flipped Classroom

Faculty Name: Dr.B.Lakshmi Praveena

Class: II-II

Academic Year: 2023-24

Subject Name: DBMS

Topic: Transaction Management

Date: 2-8-2023

Brief Write – Up:

Students are assigned with specific topics and database schema. Students narrated the topic with the help of given database schema in normalization forms.

Objective:

To engage students in active learning by having them prepare before class and then participate in in-depth discussions and activities during the class session to reinforce their understanding of transaction management in DBMS.

Pre-Class Preparation (Students Complete Before Class)

1. Assigned Reading:

- **Chapter on Transaction Management**: Provide students with a chapter from their textbook or an online resource on transaction management. Key topics should include ACID properties, transaction states, concurrency control, and recovery techniques.

2. Video Lecture:

- **Introduction to Transaction Management**: Create or curate a 15-20 minute video lecture that covers the basics of transaction management, including ACID properties (Atomicity, Consistency, Isolation, Durability), transaction states, and examples of transaction operations in SQL.

3. Quiz:

- **Pre-Class Quiz**: Create a short online quiz with multiple-choice questions to assess students' understanding of the assigned reading and video lecture. This quiz should be completed before coming to class to ensure they have grasped the basic concepts.

In-Class Activities (Active Learning During Class)

1. Quick Review and Q&A (15 minutes):

- **Review Key Concepts**: Start with a brief review of the key concepts from the pre-class materials.
- **Q&A Session**: Address any questions or confusion from the students regarding the pre-class materials. Encourage students to share their quiz results and discuss any difficult questions.

2. Group Activity: ACID Properties (20 minutes):

- **Divide into Groups**: Divide the class into small groups and assign each group one of the ACID properties.
- **Task**: Each group will create a poster or slide explaining their assigned property, including real-world examples and its importance in transaction management.
- **Presentation**: Groups will present their findings to the class, followed by a brief discussion.

3. Hands-On Exercise: SQL Transactions (30 minutes):

- **SQL Practice**: Provide students with a database schema and sample data.
- **Task**: Each student will write SQL queries to perform a series of transactions. Include tasks like:
    - Starting a transaction.
    - Committing a transaction.
    - Rolling back a transaction.
    - Demonstrating isolation levels.
- **Pair Programming**: Encourage students to work in pairs to solve these tasks, promoting peer learning.

4. Case Study Discussion: Concurrency Control (20 minutes):

- **Case Study**: Present a case study that involves concurrency control issues, such as lost updates, dirty reads, and uncommitted data.
- **Discussion**: Facilitate a class discussion on how to resolve these issues using locking mechanisms, timestamps, or other concurrency control techniques.
- **Problem-Solving**: Students will work in groups to propose solutions to the issues presented in the case study.

5. Reflection and Feedback (15 minutes):

- **Individual Reflection**: Ask students to reflect on what they learned during the class and write a short summary.

- **Class Feedback**: Collect feedback on the flipped classroom approach and the in-class activities. Use this feedback to improve future sessions.

Post-Class Assignment

1. Assignment: Transaction Management Scenarios:

- **Scenarios**: Provide a set of scenarios involving complex transactions, including those with concurrency and recovery issues.
- **Task**: Students will write detailed solutions for managing these transactions, ensuring ACID compliance, and handling concurrency control and recovery.

2. Follow-Up Quiz:

- **Quiz**: Create a follow-up quiz to assess students' understanding of the in-class activities and post-class assignment.

Learning Outcomes:

- **Understanding of Transaction Management**: Students will gain a comprehensive understanding of transaction management, including ACID properties, transaction states, concurrency control, and recovery techniques.
- **Application of Concepts**: Students will apply theoretical concepts to practical scenarios, enhancing their problem-solving skills in transaction management.
- **Active Participation**: Through group activities and discussions, students will actively participate and collaborate, leading to a deeper understanding of the material.
- **Continuous Improvement**: Reflection and feedback will help students and instructors continuously improve the learning experience.

No. of Students Participated: 60

Photos:


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BVRIT HYDERABAD College of Engineering for Women

Department of Electronics and Communication Engineering

Name of the Activity: Experimental Learning

Faculty Name: Dr.B.Lakshmi Praveena

Class: II-II

Academic Year: 2023-24

Subject Name: DBMS

Topic: Relational Algebra

Date: 20-9-2023

Brief Write – Up:

Problem Statement:

Provided relational database schema and a series of queries that they need to solve using relational algebra operations.

Activity Steps:

Step 1: Understanding the Database Schema

- Distribute the database schema and explain the structure of the tables involved.
- Example schema:

Students Table:

StudentID	Name	Age	Major
1	Alice	20	CS
2	Bob	22	Math
3	Carol	21	CS

Courses Table:

CourseID	CourseName	Credits
101	DBMS	4
102	Algorithms	3
103	Calculus	3

Enrollments Table:

StudentID	CourseID
1	101
2	103
3	101
3	102

Step 2: Formulating Queries in Relational Algebra

- Divide students into small groups and assign each group specific queries to solve using relational algebra.
- Example queries:
    1. Retrieve the names of all students enrolled in the DBMS course.
    2. List all courses taken by students majoring in Computer Science (CS).
    3. Find students who are enrolled in both DBMS and Algorithms courses.

Step 3: Applying Relational Algebra Operations

- Each group formulates the relational algebra expressions for their assigned queries.
- Example solutions:
    1. **Retrieve the names of all students enrolled in the DBMS course**:
        - Identify the DBMS course:
          `π[CourseID](σ[CourseName='DBMS'](Courses))`
        - Find enrollments in the DBMS course:
          `π[StudentID](σ[CourseID=101](Enrollments))`
        - Retrieve student names: `π[Name](Students ⋈ π[StudentID](σ[CourseID=101](Enrollments)))`
    2. **List all courses taken by students majoring in CS**:
        - Identify CS students: `π[StudentID](σ[Major='CS'](Students))`
        - Find enrollments of CS students: `Enrollments ⋈ π[StudentID](σ[Major='CS'](Students))`

- Retrieve course names: `π[CourseName](Courses ⋈ (Enrollments ⋈ π[StudentID](σ[Major='CS'](Students))))`

3. **Find students who are enrolled in both DBMS and Algorithms courses**:
   - Identify DBMS enrollments: `π[StudentID](σ[CourseID=101](Enrollments))`
   - Identify Algorithms enrollments: `π[StudentID](σ[CourseID=102](Enrollments))`
   - Find common students: `π[Name](Students ⋈ (π[StudentID](σ[CourseID=101](Enrollments)) ∩ π[StudentID](σ[CourseID=102](Enrollments))))`

Step 4: Implementing Queries in a DBMS

- Students implement their relational algebra queries using a relational database management system (RDBMS) like MySQL or PostgreSQL to verify the results.
- Provide guidance and support as they translate relational algebra expressions into SQL queries.

Step 5: Presenting Results

- Each group presents their queries, relational algebra expressions, SQL translations, and the results obtained.
- Discuss any challenges faced and solutions found during the activity.

Evaluation Criteria:

1. **Understanding of Relational Algebra (20%)**
   - Clarity and correctness in formulating relational algebra expressions.
2. **Application of Operations (30%)**
   - Effective use of relational algebra operations to solve the queries.
3. **SQL Implementation (30%)**
   - Accurate translation of relational algebra expressions into SQL queries and successful execution.
4. **Presentation and Collaboration (20%)**
   - Quality of group presentation and collaborative effort.

Learning Outcomes:

- Develop a deeper understanding of relational algebra and its operations.
- Gain hands-on experience in formulating and implementing database queries.
- Enhance problem-solving skills and ability to translate theoretical concepts into practical applications.
- Improve teamwork and communication skills through collaborative learning.

No. of Students Participated: 15

Photos:

BVRIT HYDERABAD College of Engineering for Women

Department of Electronics and Communication Engineering

Name of the Activity: Collaborative Learning

Faculty Name: Dr.B.Lakshmi Praveena

Class: II-II

Academic Year: 2023-24

Subject Name: DBMS

Topic: SQL Queries

Date: 2-9-2023

Brief Write – Up:

Students are assigned with database schema and DML query questions. Students narrated the topic with the help of given database schema in normalization forms.

Introduction (5 minutes):

Initially, students start with a brief introduction to SQL queries, including SELECT, INSERT, UPDATE, DELETE, and JOIN operations. The goal is to ensure students understand the basic syntax and functionality of these SQL commands.

Highlight Key Definitions:

- **SQL (Structured Query Language)**: A standard language for managing and manipulating databases.
- **SELECT**: Retrieves data from one or more tables.
- **INSERT**: Adds new records to a table.
- **UPDATE**: Modifies existing records in a table.
- **DELETE**: Removes records from a table.
- **JOIN**: Combines rows from two or more tables based on a related column.

Activity: Problem-Based Learning

Problem Statement:

Provide each group with a problem statement that involves creating and executing various SQL queries to retrieve, manipulate, and analyze data from a given database.

Activity Steps:

Step 1: Understanding the Problem:

- Each group reads and discusses the problem statement to ensure a clear understanding.
- Discuss the database schema and the tables involved.

Step 2: Writing SQL Queries:

- Identify the requirements of the problem statement and determine the necessary SQL queries.
- Write SQL queries to achieve the desired outcomes (e.g., retrieve specific data, update records, etc.).

Step 3: Executing SQL Queries:

- Execute the written SQL queries in a DBMS (e.g., MySQL, PostgreSQL).
- Ensure that the queries run successfully and produce the expected results.

Step 4: Analyzing and Verifying Results:

- Analyze the output of the executed queries to verify accuracy.
- Cross-check the results against the problem requirements.

Example Problem Statement:

1. **Database Schema:**
    - `Students` (StudentID, Name, Age, Major)
    - `Courses` (CourseID, CourseName, Credits)
    - `Enrollments` (StudentID, CourseID, Grade)
2. **Tasks:**
    - **Retrieve Data**:
        - Write a query to list all students and their respective majors.
        - Write a query to list all courses with more than 3 credits.
    - **Insert Data**:
        - Write a query to add a new student to the `Students` table.
    - **Update Data**:
        - Write a query to update the major of a specific student.
    - **Delete Data**:
        - Write a query to delete a student record.
    - **Join Operations**:
        - Write a query to list all students enrolled in a specific course along with their grades.

Evaluation Criteria:

1. **Understanding of Problem (10%)**

    - Clarity in understanding the problem statement and requirements.
2. **Writing SQL Queries (40%)**
    - Correctness and efficiency of the SQL queries written.
3. **Execution and Results (30%)**
    - Successful execution of queries and accuracy of the results.
4. **Analysis and Verification (20%)**
    - Ability to analyze and verify the results against the problem requirements.

Learning Outcomes:

- Develop proficiency in writing and executing SQL queries.
- Understand and apply various SQL operations to manage and manipulate database data.
- Enhance problem-solving skills in the context of database management.
- Improve collaborative and communication skills through group work.

No. of Students Participated: 15

Photos:

BVRIT HYDERABAD College of Engineering for Women

Department of Electronics and Communication Engineering

Name of the Activity: Story Telling

Faculty Name: Dr.B.Lakshmi Praveena

Class: II-II

Academic Year: 2023-24

Subject Name: DBMS

Topic: Normalization

Date: 2-8-2023

Brief Write – Up:

Students are assigned with specific topics and database schema. Students narrated the topic with the help of given database schema in normalization forms.

Objective:

To help students understand the concepts of database normalization through an engaging and memorable storytelling activity.

Introduction (5 minutes):

- Begin with a brief overview of what normalization is and why it is important in database management.
- Explain that normalization is a process used to organize a database into tables and columns to minimize data redundancy and improve data integrity.

Story: "The Tale of the Cluttered Library"

Characters:

- **Alice**: A librarian who loves order and efficiency.
- **Bob**: A librarian who prefers to keep things as they are, despite the mess.
- **Professor Normalization**: An expert in database management who helps Alice and Bob organize the library.

Act 1: The Cluttered Library

Narrator: "Once upon a time, in a busy town, there was a library managed by two librarians, Alice and Bob. The library had a massive collection of books, but the records were a mess. Books, authors, genres, and borrower's information were all jumbled together in one big table."

Table:

BookID	BookTitle	AuthorName	Genre	BorrowerName	BorrowerAddress	BorrowerPhone
1	"Book A"	Author X	Fiction	John Doe	123 Maple St.	123-456-7890
2	"Book B"	Author Y	Mystery	Jane Smith	456 Oak St.	987-654-3210
3	"Book A"	Author X	Fiction	Alice Brown	789 Pine St.	555-555-5555

Narrator: "Alice was frustrated with the inefficiency and errors in the records. Bob, on the other hand, didn't see a problem and was reluctant to change anything."

Act 2: The Visit from Professor Normalization

Narrator: "One day, Professor Normalization visited the library. Seeing the disorganized records, he offered to help Alice and Bob."

Professor Normalization: "The first step in organizing your data is to understand the concept of normalization. Let me guide you through this process."

Act 3: First Normal Form (1NF)

Professor Normalization: "First, let's apply the First Normal Form (1NF). This means eliminating duplicate columns and ensuring that each column contains atomic values."

Table After 1NF:

BookID	BookTitle	AuthorName	Genre	BorrowerName	BorrowerAddress	BorrowerPhone
1	"Book A"	Author X	Fiction	John Doe	123 Maple St.	123-456-7890
2	"Book B"	Author Y	Mystery	Jane Smith	456 Oak St.	987-654-3210
3	"Book A"	Author X	Fiction	Alice Brown	789 Pine St.	555-555-5555

Narrator: "Alice saw that while this cleaned up some duplication, the real problem was still there – too much redundancy and potential for errors."

Act 4: Second Normal Form (2NF)

Professor Normalization: "Next, we'll apply the Second Normal Form (2NF). We need to remove subsets of data that apply to multiple rows and place them in separate tables. Each table should only contain data that pertains to a specific topic."

Tables After 2NF:

Books Table:

BookID	BookTitle	AuthorName	Genre
1	"Book A"	Author X	Fiction
2	"Book B"	Author Y	Mystery

Borrowers Table:

BorrowerID	BorrowerName	BorrowerAddress	BorrowerPhone
1	John Doe	123 Maple St.	123-456-7890
2	Jane Smith	456 Oak St.	987-654-3210
3	Alice Brown	789 Pine St.	555-555-5555

BorrowedBooks Table:

BookID	BorrowerID
1	1
2	2
1	3

Narrator: "Alice noticed that the data was now more organized and less redundant, but Professor Normalization wasn't finished yet."

Act 5: Third Normal Form (3NF)

Professor Normalization: "Finally, we'll apply the Third Normal Form (3NF). This means removing columns that are not dependent on the primary key."

Tables After 3NF:

Books Table:

BookID	BookTitle	AuthorID	Genre
1	"Book A"	1	Fiction
2	"Book B"	2	Mystery

Authors Table:

AuthorID	AuthorName
1	Author X
2	Author Y

Borrowers Table:

BorrowerID	BorrowerName	BorrowerAddress	BorrowerPhone
1	John Doe	123 Maple St.	123-456-7890
2	Jane Smith	456 Oak St.	987-654-3210
3	Alice Brown	789 Pine St.	555-555-5555

BorrowedBooks Table:

BookID	BorrowerID
1	1
2	2

BookID BorrowerID

1 3

Narrator: "With the library records now organized according to the rules of normalization, Alice found that managing the library became much easier. There were fewer errors, and retrieving information was quick and efficient."

Conclusion (5 minutes):

- Recap the key steps of normalization: 1NF, 2NF, and 3NF.
- Emphasize the importance of normalization in reducing redundancy and improving data integrity.
- Encourage students to ask questions and discuss how they can apply normalization to their own database projects.

No. of Students Participated: 15

Photos: