Module 02 - Database Architecture and Models Relational and Normalization

Course Outcome

At the end of this course, students will:

- Understand basic database concepts, including the structure an operation of the relational and non-relational data model, design principles, E-R diagrams, E-R modeling, data warehousing, client/server, and internet database environments
- Apply the concept of a database transaction and related database facilities, including concurrency control, journaling, backup and recovery, and data object locking and protocols.
- Analyze advanced database topics such as distributed database systems, data modeling techniques and the data warehouse.
- Evaluate administration and security issues, and three enterprise database management systems widely used by organizations.
- Create a database management and security plan for a database project.

Core Concepts

- Identify Data Modeling and Data Models
- Data Model Basic Building Blocks

- Translating Business Rules into Data Model Components
- Naming Conventions
- The Relational Model
- The Entity Relationship Model
- Big Data and NoSQL

Activities

- The Muddiest Point
- Concept Test
- Discussion Board
- Hands-On Practice
- Programming Exercise
- Knowledge Check

Required Reading

Negi, M. (2019). Fundamental of Database Management System. BPB Publications. (ISBN: 9789388176620)

- Chapter 2: Database Architecture and Models
- Chapter 3: Relational Databases and Normalization

Additional

Manning, A. (2015). Databases for small business: essentials of database management, data analysis, and staff training for entrepreneurs and professionals. Apress. (ISBN: 9781484202784)

Coronel, C., & Morris, S. (2019). Database Systems: Design, Implementation, & Management. Cengage Learning. (ISBN: 9780357687536)

Silberschatz, A., Korth, H. F., & Sudarshan, S. (2019). Database System Concepts (7th Ed.). McGraw-Hill. (ISBN: 9780078022159)

MP02: The Muddiest Point

Q1: After reading the required reading, select only one key topic that you could not clearly understand or found confusing. If you understood everything and nothing needs further clarification, find one topic/concept that you found interesting.

Briefly describe the muddiest point or the most interesting point.

Your instructor will visit the collected topics and explain the muddiest topic(s) in class.

Q2: Which best describes the role of DISTINCT clause?

1. To query unique rows in a table
2. To query data from multiple tables
3. To filter rows in the result set
4. To filter groups

KC02: Knowledge Check

Q1: What relationship is expressed the term: "STUDENT takes CLASS"?

1. It is considered as "Constraint"
2. Many-to-many (M: N)
3. One-to-many (1:M)
4. One-to-one (1:1)

Q2: A single row or record of a table is called ?

1. Cardinality
2. Degree
3. Tuple
4. Column

Q3: Which of the following key uniquely identifies each tuple (record) in a database table?

1. Primary key
2. Composite key
3. Foreign key
4. Candidate key

Q4: Which of the following describes particular characteristics of the entity?

1. Relationships
2. Entity occurrence
3. Chen notation
4. Attribute

Q5: What is "Inheritance" in database?

1. Ability of an object within the class hierarchy to inherit the attributes and methods
2. Is an abstraction of a real-world entity and represents only one occurrence of an entity
3. Describes the properties of an object
4. Represents a real-world action and equivalent of procedures in traditional programming languages

CT02: Concept Test

Part 1 (Due Wednesday)

Which one of the following tables is required the Composite Key? Justify your answer.

a)

Student_id	Student_Name	Phone	Age
201	Alfred	9856322555	19
202	Manish	9856325471	52
203	Peter	9856325874	27
204	Joshua	9658963251	33
205	Enrique	9658739822	41
206	Ganesh	9856589193	29

b)

Student_id	Subject_id	Marks	Subject_Name
201	M001	45	Biology
201	S001	56	Mathematics
202	M001	85	Science
203	S001	47	Mathematics
203	M001	23	Physics
204	S001	92	History

Part 2 (Due Sunday)

Respond to **one** of your classmates by critiquing his or her choice and justification. You are not allowed to select the same classmate if you chose the peer last week. You can convince your peer with your answer if the peer's answer is different from yours. If both have the same answer, you can discuss your justification with your peer to reinforce your answer.

DB02: Discussion Board

Part 1 (Due Wednesday)

What is the Conceptual Model and how to measure concepts in Business Research for a Conceptual Model?

Please share your idea with the group with a minimum of 250 words.

Part 2 (Due Sunday)

To extend the discussion, first review the posts of your classmates. Then choose at least two of your classmates' posts and respond with thoughtful and substantive contributions. Answer any questions from your instructor.

IS 456 IT Database Systems Management

Programming Exercise 1

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SQLite-Using Chinook database: (**Database is available in GitHub repository under db folder)**

Task1:

Using Command Prompt, write a command to access the chinook databases and shows all the tables list in that database. Take a screenshot and submit it.

Task2:

Using Command Prompt, write a command to save 24 Tracks from the album table and order them by title, into a text file. Take a screenshot and submit it.