

# CS403

## Database Management System

### Important mcqs

#### Lec 1 - Introduction to the course

1. **What is the primary goal of this course?**
- A. To teach advanced skills in the field
  - B. To provide a broad introduction to the topic
  - C. To specialize in a particular area of the subject
  - D. To study current research trends

**Answer: B**

**What methods of instruction will be used in the course?**

- A. Lectures, readings, and hands-on activities
- B. Lectures and exams only
- C. Independent research only
- D. Group projects and presentations only

**Answer: A**

**What type of topics may be covered in this course?**

- A. Historical and contemporary issues
- B. Advanced research techniques only
- C. Personal opinions and beliefs
- D. Political and religious ideologies

**Answer: A**

**What skills will students develop in this course?**

- A. Advanced technical skills only
- B. Analytical, synthesizing, and applying knowledge
- C. Public speaking and presentation skills only
- D. Interpersonal communication skills

**Answer: B**

**What will students have at the end of the course?**

- A. Mastery of the subject
- B. Basic knowledge of the subject
- C. A specialization in a particular area of the subject
- D. A certificate of completion

**Answer: B**

**What are the potential benefits of taking this course?**

- A. Advanced job opportunities
- B. Preparation for graduate studies
- C. Personal enrichment and knowledge

D. All of the above

**Answer: D**

**What is the prerequisite for this course?**

- A. Advanced knowledge of the subject
- B. A bachelor's degree in a related field
- C. None
- D. Previous experience in the field

**Answer: C**

**What is the format of the exams in this course?**

- A. Multiple-choice only
- B. Essays only
- C. Combination of multiple-choice and essays
- D. No exams are given

**Answer: C**

**How can students apply the knowledge gained from this course?**

- A. In real-world contexts
- B. Through memorization and repetition
- C. By taking advanced courses in the field
- D. None of the above

**Answer: A**

**Who is the target audience for this course?**

- A. Professionals in the field seeking advanced knowledge
- B. Students with no prior experience in the field
- C. Both A and B
- D. None of the above

**Answer: C**

## Lec 2 - Difference between Data and Information

### 1. Which of the following is true about data?

- a) It is processed and analyzed to provide meaning
- b) It is organized and structured
- c) It is raw and unprocessed
- d) It is always in a numerical format

**Solution: c) It is raw and unprocessed.**

### What is information?

- a) Raw and unprocessed facts and figures
- b) A collection of data that has been organized, processed, and interpreted
- c) A list of names and addresses
- d) A random assortment of numbers

**Solution: b) A collection of data that has been organized, processed, and interpreted.**

### Which of the following best describes the relationship between data and information?

- a) Data and information are the same thing
- b) Data is a subset of information
- c) Information is a subset of data
- d) Data and information are unrelated

**Solution: b) Data is a subset of information.**

### Which of the following is an example of data?

- a) A report summarizing the company's financial performance
- b) A spreadsheet with customer names and contact information
- c) A graph showing the number of visitors to a website
- d) A presentation outlining marketing strategies

**Solution: c) A graph showing the number of visitors to a website.**

### Which of the following is an example of information?

- a) A list of employee names and contact information
- b) A table with sales figures for the past month
- c) A chart showing the distribution of ages in a population
- d) A collection of raw survey responses

**Solution: c) A chart showing the distribution of ages in a population.**

### Data can be:

- a) Meaningful without any interpretation
- b) Interpreted without being organized
- c) Processed without being analyzed
- d) All of the above

**Solution: b) Interpreted without being organized.**

### Which of the following is an example of unstructured data?

- a) A customer's name and address
- b) A credit card number
- c) A social media post
- d) A product SKU number

**Solution: c) A social media post.**

### Which of the following is true about data mining?

- a) It is the process of creating data

- b) It is the process of deleting data
- c) It is the process of analyzing data to extract information
- d) It is the process of encrypting data

**Solution: c) It is the process of analyzing data to extract information.**

**Which of the following is an example of a data visualization?**

- a) A bar chart showing the number of customers by region
- b) A list of customer names and addresses
- c) A memo detailing company policies
- d) A spreadsheet with sales figures

**Solution: a) A bar chart showing the number of customers by region.**

**Which of the following is an example of structured data?**

- a) A customer's email address
- b) A tweet from a customer
- c) A photograph of a product
- d) A list of products and their prices

**Solution: d) A list of products and their prices.**

## Lec 3 - Database Architecture

### 1. What is the purpose of database architecture?

- A) To store data
- B) To manage data
- C) To organize data
- D) All of the above

Answer: D) All of the above

### What is a database schema?

- A) A data structure that defines the logical organization of data
- B) A set of rules that govern the relationships between tables
- C) A diagram that shows the relationships between tables
- D) All of the above

Answer: A) A data structure that defines the logical organization of data

### What is a database management system (DBMS)?

- A) A software application that interacts with the database
- B) A set of tools for managing the database
- C) A system that provides a way to store, retrieve, and manipulate data
- D) All of the above

Answer: D) All of the above

### What is a database instance?

- A) A running copy of a database
- B) A set of tables that store data
- C) A collection of related data
- D) None of the above

Answer: A) A running copy of a database

### What is a database server?

- A) A computer that stores the database
- B) A software application that manages the database
- C) A system that provides access to the database
- D) All of the above

Answer: D) All of the above

### What is a client-server database architecture?

- A) A system in which clients access a central server to retrieve data
- B) A system in which clients store data on their local machines
- C) A system in which clients share data with each other directly
- D) None of the above

Answer: A) A system in which clients access a central server to retrieve data

### What is a distributed database architecture?

- A) A system in which data is stored on multiple servers
- B) A system in which data is stored on a single server
- C) A system in which clients share data with each other directly
- D) None of the above

Answer: A) A system in which data is stored on multiple servers

### What is a peer-to-peer database architecture?

- A) A system in which clients access a central server to retrieve data

- B) A system in which clients store data on their local machines
- C) A system in which clients share data with each other directly
- D) None of the above

**Answer: C) A system in which clients share data with each other directly**

**What is a database trigger?**

- A) A program that runs automatically in response to a database event
- B) A query that retrieves data from the database
- C) A report that summarizes data from the database
- D) None of the above

**Answer: A) A program that runs automatically in response to a database event**

**What is a database index?**

- A) A data structure that improves the speed of data retrieval
- B) A set of rules that govern the relationships between tables
- C) A diagram that shows the relationships between tables
- D) None of the above

**Answer: A) A data structure that improves the speed of data retrieval**

## Lec 4 - Internal or Physical View / Schema

### 1. What is the internal or physical view/schema of a database?

- a) The way data is logically organized within a database
- b) The way data is physically stored on the storage media
- c) The way data is presented to end-users

Answer: b) The way data is physically stored on the storage media

### Which of the following describes the internal view of a database?

- a) A high-level view of the data and its relationships
- b) A low-level view of the data storage and access methods
- c) A view of the data as it is presented to end-users

Answer: b) A low-level view of the data storage and access methods

### Which of the following is not a component of the internal view/schema of a database?

- a) Storage format
- b) Data structures
- c) Indexing methods
- d) User interface design

Answer: d) User interface design

### The internal view/schema of a database is important for:

- a) End-users
- b) Database administrators
- c) Both end-users and database administrators

Answer: b) Database administrators

### Which of the following is an example of a storage format used in the internal view of a database?

- a) XML
- b) SQL
- c) Binary

Answer: c) Binary

### Which of the following is an example of a data structure used in the internal view of a database?

- a) Linked list
- b) Array
- c) Stack

Answer: a) Linked list

### Which of the following is an example of an indexing method used in the internal view of a database?

- a) Binary search
- b) Bubble sort
- c) Quick sort

Answer: a) Binary search

### The internal view/schema of a database is also known as:

- a) The conceptual view

- b) The physical view
- c) The external view

Answer: b) The physical view

**Which of the following best describes the relationship between the internal view and the external view of a database?**

- a) The internal view is a high-level view of the data, while the external view is a low-level view of the data storage and access methods.
- b) The internal view is a low-level view of the data storage and access methods, while the external view is a high-level view of the data.
- c) The internal view and the external view are the same thing.

Answer: b) The internal view is a low-level view of the data storage and access methods, while the external view is a high-level view of the data.

**Which of the following is not a reason why the internal view/schema of a database is important?**

- a) To optimize database performance
- b) To ensure efficient data retrieval
- c) To present data to end-users

Answer: c) To present data to end-users



## Lec 5 - Database Development Process

1. What is the first step in the database development process?

- a. Design schema
- b. Implement database
- c. Gather requirements
- d. Test database

Answer: c. Gather requirements

Which phase of the database development process involves creating a conceptual model of the database?

- a. Requirements gathering
- b. Data modeling
- c. Schema design
- d. Implementation

Answer: b. Data modeling

What is the purpose of schema design in the database development process?

- a. To gather requirements from users
- b. To create a conceptual model of the database
- c. To design the physical structure of the database
- d. To implement the database

Answer: c. To design the physical structure of the database

Which phase of the database development process involves writing code to create tables, indexes, and other database objects?

- a. Requirements gathering
- b. Data modeling
- c. Schema design
- d. Implementation

Answer: d. Implementation

Which phase of the database development process involves testing the database for functionality and performance?

- a. Requirements gathering
- b. Data modeling
- c. Schema design
- d. Testing

Answer: d. Testing

Which phase of the database development process involves ensuring the database is secure and meets regulatory compliance requirements?

- a. Requirements gathering
- b. Data modeling
- c. Schema design
- d. Maintenance

Answer: d. Maintenance

What is the purpose of normalization in the database development process?

- a. To ensure the database meets regulatory compliance requirements

- b. To eliminate redundancy and improve data integrity
- c. To optimize database performance
- d. To test the database for functionality and performance

**Answer: b. To eliminate redundancy and improve data integrity**

**Which phase of the database development process involves determining the storage requirements for the database?**

- a. Requirements gathering
- b. Data modeling
- c. Schema design
- d. Implementation

**Answer: c. Schema design**

**Which phase of the database development process involves creating user interfaces and reports for accessing the database?**

- a. Requirements gathering
- b. Data modeling
- c. Schema design
- d. Implementation

**Answer: d. Implementation**

**What is the purpose of backup and recovery planning in the database development process?**

- a. To ensure the database meets regulatory compliance requirements
- b. To eliminate redundancy and improve data integrity
- c. To optimize database performance
- d. To protect against data loss and ensure availability of the database

**Answer: d. To protect against data loss and ensure availability of the database**

## Lec 6 - Detailed Data Flow Diagram

### 1. What is a detailed data flow diagram?

- a. A diagram that shows only inputs to a system
- b. A diagram that shows only outputs from a system
- c. A diagram that shows the flow of data through a system
- d. A diagram that shows the physical components of a system

Answer: c

### What is the purpose of a detailed data flow diagram?

- a. To identify inefficiencies in a system
- b. To show the physical components of a system
- c. To show only the inputs to a system
- d. To show only the outputs from a system

Answer: a

### How many levels of diagrams are typically included in a detailed data flow diagram?

- a. One
- b. Two
- c. Three
- d. Four

Answer: c

### What is an intermediate data flow?

- a. Data that enters a system
- b. Data that exits a system
- c. Data that is processed within a system
- d. Data that is stored within a system

Answer: c

### Which of the following is NOT typically shown on a detailed data flow diagram?

- a. Inputs
- b. Outputs
- c. Physical components
- d. Intermediate data flows

Answer: c

### What is the benefit of using a detailed data flow diagram?

- a. To identify inefficiencies in a system
- b. To show the physical components of a system
- c. To show only the inputs to a system
- d. To show only the outputs from a system

Answer: a

### What does a detailed data flow diagram help to identify?

- a. System components
- b. Input sources
- c. Output destinations
- d. Inefficiencies and bottlenecks

Answer: d

### How is a detailed data flow diagram different from a high-level data flow diagram?

- a. It shows more levels of detail

- b. It shows fewer levels of detail
- c. It shows only inputs and outputs
- d. It shows physical components of a system

**Answer: a**

**Which of the following is an example of an intermediate data flow?**

- a. User input
- b. Output report
- c. Calculation result
- d. System error message

**Answer: c**

**What is the primary purpose of a detailed data flow diagram?**

- a. To show the physical components of a system
- b. To show only the inputs to a system
- c. To show only the outputs from a system
- d. To show the flow of data through a system

**Answer: d**

## Lec 7 - Entity-Relationship Data Model

1. Which of the following is a symbol used in an ER diagram to represent an entity?

- a) Circle
- b) Triangle
- c) Rectangle
- d) Diamond

Answer: c) Rectangle

In an ER diagram, what does a line with an arrow at one end represent?

- a) A one-to-one relationship
- b) A many-to-one relationship
- c) A one-to-many relationship
- d) A many-to-many relationship

Answer: b) A many-to-one relationship

Which of the following is NOT a cardinality constraint in an ER diagram?

- a) One-to-one
- b) One-to-many
- c) Many-to-one
- d) Many-to-many

Answer: c) Many-to-one

In an ER diagram, a weak entity is represented by:

- a) A rectangle with rounded corners
- b) A rectangle with double lines
- c) A rectangle with a dashed border
- d) A rectangle with a triangle in the corner

Answer: c) A rectangle with a dashed border

In an ER diagram, which of the following represents an attribute of an entity?

- a) Circle
- b) Triangle
- c) Rectangle
- d) Diamond

Answer: a) Circle

Which of the following is an example of a relationship in an ER diagram?

- a) Employee
- b) Salary
- c) Department
- d) Address

Answer: c) Department

In an ER diagram, a ternary relationship involves how many entities?

- a) One
- b) Two
- c) Three
- d) Four

Answer: c) Three

Which of the following is NOT a type of relationship in an ER diagram?

- a) Unary

- b) Binary
- c) Ternary
- d) Quadratic

Answer: d) Quadratic

**In an ER diagram, what does a double line between entities represent?**

- a) A one-to-one relationship
- b) A many-to-one relationship
- c) A one-to-many relationship
- d) A many-to-many relationship

Answer: d) A many-to-many relationship

**In an ER diagram, what does a diamond shape represent?**

- a) An entity
- b) An attribute
- c) A relationship
- d) A key

Answer: c) A relationship

## Lec 8 - Attributes

1. Which of the following is a characteristic of an attribute in a database?

- A. It describes the structure of a database
- B. It represents a relationship between entities
- C. It describes the properties of an entity
- D. It defines the rules for data manipulation

Answer: C

What is the difference between a single-valued and a multi-valued attribute?

- A. Single-valued attributes are mandatory, while multi-valued attributes are optional.
- B. Single-valued attributes can have only one value, while multi-valued attributes can have multiple values.
- C. Single-valued attributes are used to identify an entity, while multi-valued attributes are used to describe the entity.
- D. Single-valued attributes are atomic, while multi-valued attributes are composite.

Answer: B

Which of the following data types can an attribute have?

- A. String
- B. Numeric
- C. Date
- D. All of the above

Answer: D

Which of the following is not an example of an attribute?

- A. Customer ID
- B. Order Date
- C. Product Price
- D. Customer Address Book

Answer: D

In database design, what is the purpose of defining attributes?

- A. To identify relationships between entities
- B. To define the structure of the database
- C. To describe the properties of an entity
- D. To enforce data integrity rules

Answer: C

Which of the following is an example of a composite attribute?

- A. Customer Name
- B. Customer Address
- C. Customer Phone Number
- D. Customer Email Address

Answer: B

Which of the following is an example of a derived attribute?

- A. Customer ID
- B. Order Total
- C. Product Description

D. Order Quantity

**Answer: B**

**Which of the following is an example of a domain constraint on an attribute?**

- A. A maximum length for a string attribute
- B. A minimum and maximum value for a numeric attribute
- C. A specific set of values for a categorical attribute
- D. All of the above

**Answer: D**

**In a database table, what is a key attribute?**

- A. An attribute used to uniquely identify each entity
- B. An attribute used to describe the properties of an entity
- C. An attribute used to define the relationships between entities
- D. An attribute used to enforce data integrity rules

**Answer: A**

**What is the difference between a primary key and a foreign key in a database?**

- A. A primary key is used to uniquely identify an entity, while a foreign key is used to represent a relationship between entities.
- B. A primary key is used to represent a relationship between entities, while a foreign key is used to uniquely identify an entity.
- C. A primary key and a foreign key are the same thing.
- D. A primary key is used to enforce data integrity rules, while a foreign key is used to define the structure of the database.

**Answer: A**



## Lec 9 - Relationships

### 1. In the context of databases, what is a relationship?

- A) The physical structure of a database
- B) The association between entities
- C) The SQL query used to retrieve data
- D) The primary key of a table

**Answer: B) The association between entities**

### What are the different types of relationships in an Entity-Relationship Diagram (ERD)?

- A) One-to-one, many-to-one, and many-to-many
- B) One-to-many, many-to-many, and exclusive-or
- C) Binary, ternary, and quaternary
- D) Functional, multivalued, and join

**Answer: B) One-to-many, many-to-many, and exclusive-or**

### What does the cardinality of a relationship in an ERD define?

- A) The number of entities involved in the relationship
- B) The types of attributes associated with the entities
- C) The physical location of the entities in the database
- D) The number of instances of an entity that can be associated with another entity

**Answer: D) The number of instances of an entity that can be associated with another entity**

### What does the degree of a relationship in an ERD refer to?

- A) The number of entities involved in the relationship
- B) The types of attributes associated with the entities
- C) The physical location of the entities in the database
- D) The number of instances of an entity that can be associated with another entity

**Answer: A) The number of entities involved in the relationship**

### Which of the following is an example of a one-to-many relationship in an ERD?

- A) A department can have many employees, but an employee can belong to only one department
- B) A customer can place many orders, and an order can have many line items
- C) A student can attend many classes, and a class can have many students
- D) A product can be sold at many stores, and a store can sell many products

**Answer: A) A department can have many employees, but an employee can belong to only one department**

### Which of the following is an example of a many-to-many relationship in an ERD?

- A) A department can have many employees, but an employee can belong to only one department
- B) A customer can place many orders, and an order can have many line items
- C) A student can attend many classes, and a class can have many students
- D) A product can be sold at many stores, and a store can sell many products

**Answer: C) A student can attend many classes, and a class can have many students**

### What is the purpose of a foreign key in a relationship?

- A) To link two tables in a database
- B) To ensure data consistency and referential integrity

C) To represent the association between entities in an ERD

D) To provide a unique identifier for each entity in a table

**Answer: B) To ensure data consistency and referential integrity**

**What is the difference between a mandatory and optional relationship?**

A) Mandatory relationships require at least one instance of an entity to be associated with another entity, while optional relationships do not.

B) Mandatory relationships involve two entities, while optional relationships involve three or more entities.

C) Mandatory relationships are represented using a solid line in an ERD, while optional relationships are represented using a dashed line.

D) Mandatory relationships are always one-to-many, while optional relationships can be one-to-one or many-to-many.

**Answer: A) Mandatory relationships require at least one instance of an entity to be associated with another entity, while optional relationships do not.**

**What is the purpose of a junction table in a many-to-many relationship?**

A) To store the attributes associated with each

## Lec 10 - Roles in Relationships

1. In a relationship between two tables, which table holds the primary key?

- a) Child table
- b) Parent table
- c) Both tables hold the primary key

Answer: b) Parent table

What is the purpose of roles in relationships?

- a) To determine the size of the tables
- b) To ensure proper establishment and management of relationships
- c) To ensure data is organized alphabetically

Answer: b) To ensure proper establishment and management of relationships

In a customer-order database, which table is the parent table?

- a) Order table
- b) Customer table
- c) Both tables are parent tables

Answer: b) Customer table

What is the role of the child table in a relationship?

- a) Hold the primary key
- b) Hold the foreign key that references the primary key in the parent table
- c) Both a and b

Answer: b) Hold the foreign key that references the primary key in the parent table

Which of the following is an example of a role in a relationship?

- a) Customer ID
- b) Order date
- c) Product name

Answer: a) Customer ID

What does understanding roles in relationships help prevent?

- a) Data inconsistencies and errors
- b) Increased performance and scalability
- c) Better data access patterns

Answer: a) Data inconsistencies and errors

Which table in a relationship references the primary key in the parent table?

- a) Child table
- b) Parent table
- c) Both tables reference each other

Answer: a) Child table

Which of the following is a benefit of understanding roles in relationships?

- a) Improved database security
- b) Increased data redundancy
- c) Improved data integrity and consistency

Answer: c) Improved data integrity and consistency

In a relationship, what is the purpose of the foreign key?

- a) To reference the primary key in the parent table

- b) To hold the primary key in the child table
- c) To hold additional data related to the relationship

**Answer: a) To reference the primary key in the parent table**

**How does understanding roles in relationships help with database design?**

- a) It helps ensure proper establishment and management of relationships
- b) It determines the data access patterns
- c) It helps with database backups and restores

**Answer: a) It helps ensure proper establishment and management of relationships**

## Lec 11 - Inheritance Is

### 1. In object-oriented programming, what is inheritance?

- a) A process of creating new objects
- b) A process of copying existing objects
- c) A process of deriving new classes from existing classes
- d) A process of extending the functionality of existing classes

Answer: c) A process of deriving new classes from existing classes

### Which keyword is used to implement inheritance in Java?

- a) extends
- b) implements
- c) abstract
- d) final

Answer: a) extends

### Inheritance enables:

- a) Code reuse
- b) Code duplication
- c) Code obfuscation
- d) Code obsolescence

Answer: a) Code reuse

### Which of the following statements about inheritance is true?

- a) A derived class can access the private members of its base class.
- b) A derived class can modify the private members of its base class.
- c) A derived class cannot inherit the private members of its base class.
- d) A derived class can inherit the private members of its base class, but cannot access them.

Answer: c) A derived class cannot inherit the private members of its base class.

### Which of the following is not a type of inheritance?

- a) Single inheritance
- b) Multiple inheritance
- c) Hierarchical inheritance
- d) Parallel inheritance

Answer: d) Parallel inheritance

### What is the advantage of hierarchical inheritance?

- a) It allows multiple classes to inherit from a single base class.
- b) It allows a class to inherit from multiple base classes.
- c) It allows a class to inherit from itself.
- d) It allows a class to inherit from its own child class.

Answer: a) It allows multiple classes to inherit from a single base class.

### Which of the following is not a method of implementing inheritance?

- a) Interfaces
- b) Abstract classes
- c) Composition
- d) Polymorphism

Answer: c) Composition

### Which of the following is not a disadvantage of using inheritance?

- a) Tight coupling between classes

- b) Fragile base class problem
- c) Difficulty in understanding complex class hierarchies
- d) Code obfuscation

**Answer: d) Code obfuscation**

**Which of the following statements about protected members is true?**

- a) Protected members are accessible only within the same package.
- b) Protected members are accessible only within the same class.
- c) Protected members are accessible within the same package and in derived classes.
- d) Protected members are not accessible in any circumstance.

**Answer: c) Protected members are accessible within the same package and in derived classes.**

**Which of the following is true about the final keyword in Java?**

- a) It prevents a class from being inherited.
- b) It prevents a method from being overridden.
- c) It prevents a variable from being modified.
- d) All of the above.

**Answer: d) All of the above.**

## Lec 12 - Steps in the Study of system

### 1. What is the first step in the study of a system?

- a) Identifying the system boundaries
- b) Understanding the system components
- c) Analyzing the system's behavior
- d) Proposing solutions

**Answer: a) Identifying the system boundaries**

### What is the purpose of identifying the system boundaries in the study of a system?

- a) To understand the system's components
- b) To define the system's scope
- c) To analyze the system's behavior
- d) To propose solutions

**Answer: b) To define the system's scope**

### Which step in the study of a system involves understanding the system's components and their interactions?

- a) Identifying the system boundaries
- b) Analyzing the system's behavior
- c) Understanding the system components
- d) Proposing solutions

**Answer: c) Understanding the system components**

### What is the purpose of analyzing the system's behavior in the study of a system?

- a) To identify the system boundaries
- b) To understand the system components
- c) To evaluate the system's performance
- d) To propose solutions

**Answer: c) To evaluate the system's performance**

### What is the purpose of identifying any problems or inefficiencies in the study of a system?

- a) To propose solutions
- b) To understand the system components
- c) To analyze the system's behavior
- d) To identify the system boundaries

**Answer: a) To propose solutions**

### Which step in the study of a system involves proposing solutions to improve the system's performance?

- a) Identifying the system boundaries
- b) Understanding the system components
- c) Analyzing the system's behavior
- d) Proposing solutions

**Answer: d) Proposing solutions**

### What is the purpose of understanding the system's goals in the study of a system?

- a) To identify the system boundaries
- b) To analyze the system's behavior

- c) To propose solutions
- d) To define the system's purpose

**Answer: d) To define the system's purpose**

**Which step in the study of a system involves a detailed analysis of its processes, inputs, and outputs?**

- a) Identifying the system boundaries
- b) Understanding the system components
- c) Analyzing the system's behavior
- d) Proposing solutions

**Answer: c) Analyzing the system's behavior**

**What is the purpose of identifying the system's constraints in the study of a system?**

- a) To understand the system components
- b) To analyze the system's behavior
- c) To propose solutions
- d) To define the system's limitations

**Answer: d) To define the system's limitations**

**Which step in the study of a system involves a thorough understanding of the system's stakeholders?**

- a) Identifying the system boundaries
- b) Understanding the system components
- c) Analyzing the system's behavior
- d) Proposing solutions

**Answer: b) Understanding the system components**



## Lec 13 - Identification of Entity Types of the Examination System

### 1. What is an entity type in the examination system?

- A) A type of question asked in the examination
- B) A type of answer given in the examination
- C) A type of object or concept that exists in the examination system
- D) A type of rule or regulation in the examination system

**Answer: C) A type of object or concept that exists in the examination system**

### Which of the following can be considered an entity type in the examination system?

- A) Calculator
- B) Calculator usage rules
- C) Exam duration
- D) All of the above

**Answer: A) Calculator**

### Which of the following is not an entity type in the examination system?

- A) Exam hall
- B) Student
- C) Exam rules and regulations
- D) Exam paper

**Answer: C) Exam rules and regulations**

### Which of the following is an example of an entity type in the examination system?

- A) Passing criteria
- B) Exam anxiety
- C) Exam instructions
- D) Exam center location

**Answer: A) Passing criteria**

### Which of the following is not an entity type in the examination system?

- A) Question paper
- B) Exam fees
- C) Exam results
- D) Exam schedule

**Answer: B) Exam fees**

### Which of the following is an example of an entity type in the examination system?

- A) Exam security rules
- B) Exam stress management techniques
- C) Exam invigilator
- D) Exam booking process

**Answer: C) Exam invigilator**

### Which of the following is an example of an entity type in the examination system?

- A) Exam timing
- B) Exam cheating
- C) Exam invigilation
- D) Exam dress code

**Answer: D) Exam dress code**

### Which of the following is not an entity type in the examination system?

- A) Exam hall seating arrangement

- B) Exam instructions
- C) Exam center address
- D) Exam anxiety

**Answer: D) Exam anxiety**

**Which of the following is an example of an entity type in the examination system?**

- A) Exam preparation tips
- B) Exam duration
- C) Exam motivation techniques
- D) Exam invigilator instructions

**Answer: B) Exam duration**

**Which of the following is not an entity type in the examination system?**

- A) Exam result calculation rules
- B) Exam center facilities
- C) Exam paper quality
- D) Exam fees

**Answer: D) Exam fees**

## Lec 14 - Relational Data Model

### 1. In a relational database, what is a table?

- a) A group of related files
- b) A collection of related records
- c) A list of related fields
- d) A collection of related database objects

Answer: b) A collection of related records

### What is a primary key?

- a) A key used for sorting records in a table
- b) A key that uniquely identifies each record in a table
- c) A key that defines the relationship between two tables
- d) A key that is used for authentication purposes

Answer: b) A key that uniquely identifies each record in a table

### Which of the following is not a data type commonly used in a relational database?

- a) Integer
- b) Float
- c) Character
- d) Image

Answer: d) Image

### What is a foreign key?

- a) A key that uniquely identifies each record in a table
- b) A key used for sorting records in a table
- c) A key that defines the relationship between two tables
- d) A key that is used for authentication purposes

Answer: c) A key that defines the relationship between two tables

### In a relational database, what is a view?

- a) A subset of data from one or more tables
- b) A temporary table that can be used for sorting data
- c) A table that is used to store historical data
- d) A table that is used to store metadata

Answer: a) A subset of data from one or more tables

### Which of the following is not a property of a relation in a relational database?

- a) Atomicity
- b) Consistency
- c) Durability
- d) Reliability

Answer: d) Reliability

### What is normalization in the context of a relational database?

- a) The process of removing redundancy and ensuring data consistency
- b) The process of converting data from one format to another
- c) The process of adding new tables to a database
- d) The process of backing up a database

Answer: a) The process of removing redundancy and ensuring data consistency

What is a join in a relational database?

- a) A way of creating a new table from existing tables
- b) A way of selecting data from a table based on certain criteria
- c) A way of deleting data from a table
- d) A way of updating data in a table

Answer: a) A way of creating a new table from existing tables

Which of the following is an example of a one-to-many relationship in a relational database?

- a) One student taking many courses
- b) One course having many students
- c) One student having one course
- d) One course having one student

Answer: b) One course having many students

What is a transaction in a relational database?

- a) A set of SQL commands that are executed together
- b) A unit of work that is performed on a database
- c) A way of indexing data in a table
- d) A way of backing up a database

Answer: b) A unit of work that is performed on a database

## Lec 15 - Database and Math Relations

### 1. What is a relation in mathematics?

- a) A set of ordered pairs
- b) A table with rows and columns
- c) A mathematical function
- d) A data type

Answer: a) A set of ordered pairs

### What is a relation in a database?

- a) A set of ordered pairs
- b) A table with rows and columns
- c) A mathematical function
- d) A data type

Answer: b) A table with rows and columns

### What is the purpose of domain and range in a relation?

- a) To specify the types of data that can be stored in a table
- b) To specify the primary key of a table
- c) To specify the columns of a table
- d) To specify the input and output values of a function

Answer: d) To specify the input and output values of a function

### What is the cardinality of a relation?

- a) The number of rows in a table
- b) The number of columns in a table
- c) The number of ordered pairs in a relation
- d) The number of tables in a database

Answer: c) The number of ordered pairs in a relation

### Which of the following mathematical concepts is used in database design?

- a) Set theory
- b) Geometry
- c) Trigonometry
- d) Calculus

Answer: a) Set theory

### Which of the following is not a relational database management system?

- a) MySQL
- b) Oracle
- c) MongoDB
- d) PostgreSQL

Answer: c) MongoDB

### What is the purpose of SQL?

- a) To design web pages
- b) To program software applications
- c) To manipulate data in a database
- d) To create computer graphics

Answer: c) To manipulate data in a database

### What is a primary key in a table?

- a) A field that references the primary key of another table

- b) A unique identifier for a record in a table
- c) A virtual table in a database
- d) A field that is used to store text data

**Answer: b) A unique identifier for a record in a table**

**What is the purpose of a foreign key in a table?**

- a) To establish a relationship between two tables
- b) To restrict access to sensitive data
- c) To perform calculations on data in a table
- d) To store images or other media files

**Answer: a) To establish a relationship between two tables**

**Which of the following is an advantage of using a database?**

- a) Data redundancy
- b) Data inconsistency
- c) Improved data security
- d) Limited scalability

**Answer: c) Improved data security**

## Lec 16 - Mapping Relationships

### 1. What is the purpose of mapping relationships?

- a) To create complex algorithms
- b) To identify and visualize connections between different entities
- c) To improve search engine optimization
- d) To develop new products

Answer: b) To identify and visualize connections between different entities

### Which of the following is an example of mapping relationships?

- a) Creating a social media account
- b) Drawing a family tree
- c) Writing a research paper
- d) Designing a website

Answer: b) Drawing a family tree

### Which tool is commonly used for mapping relationships?

- a) Excel
- b) PowerPoint
- c) Mind maps
- d) Word

Answer: c) Mind maps

### Which type of relationship can be represented using a network diagram?

- a) Romantic relationships
- b) Business partnerships
- c) Religious beliefs
- d) All of the above

Answer: b) Business partnerships

### What is the benefit of using a visual representation for mapping relationships?

- a) It helps to communicate complex information
- b) It makes information easier to remember
- c) It provides a clear and concise overview
- d) All of the above

Answer: d) All of the above

### What is the first step in mapping relationships?

- a) Identifying the entities to be mapped
- b) Drawing a diagram
- c) Analyzing the data
- d) Selecting a visualization tool

Answer: a) Identifying the entities to be mapped

### Which of the following is an example of a relationship that cannot be mapped?

- a) Parent-child relationships
- b) Customer-merchant relationships
- c) Political affiliations
- d) All relationships can be mapped

Answer: d) All relationships can be mapped

### Which of the following is a limitation of mapping relationships?

- a) It can be time-consuming

- b) It requires specialized knowledge
- c) It may not capture all relevant information
- d) All of the above

**Answer: d) All of the above**

**Which of the following is a popular software tool for mapping relationships?**

- a) Photoshop
- b) GIMP
- c) Inkscape
- d) Microsoft Visio

**Answer: d) Microsoft Visio**

**Which type of relationship can be represented using a flowchart?**

- a) Causal relationships
- b) Chronological relationships
- c) Hierarchical relationships
- d) All of the above

**Answer: d) All of the above**



## Lec 17 - The Project Operator

### 1. What is the role of a Project Operator in a project team?

- a. To execute all project tasks
- b. To manage and lead the project team
- c. To define the project goals and objectives
- d. All of the above

Answer: b

### Which of the following skills is essential for a Project Operator to possess?

- a. Strong technical knowledge
- b. Excellent communication skills
- c. Strategic thinking
- d. All of the above

Answer: d

### What is the main responsibility of a Project Operator?

- a. To ensure project success
- b. To monitor project progress
- c. To define project goals and objectives
- d. To manage project risks

Answer: a

### What is a Project Plan?

- a. A document outlining the project goals and objectives
- b. A document outlining the project tasks, timelines, and resources
- c. A document outlining the project risks and issues
- d. A document outlining the project budget

Answer: b

### Which of the following is NOT a key stakeholder in a project?

- a. Project team members
- b. Project sponsors
- c. Project competitors
- d. Project customers

Answer: c

### What is the purpose of a Project Charter?

- a. To define the project goals and objectives
- b. To outline the project scope, timeline, and resources
- c. To establish the authority and responsibilities of the Project Operator
- d. All of the above

Answer: d

### What is the main purpose of project risk management?

- a. To prevent risks from occurring
- b. To minimize the impact of risks
- c. To eliminate risks entirely
- d. To ignore risks and focus on the project objectives

Answer: b

### What is a Work Breakdown Structure (WBS)?

- a. A document outlining project risks and issues

- b. A document outlining project tasks and timelines
- c. A document outlining project resources and budget
- d. A document outlining project goals and objectives

**Answer: b**

**Which of the following is a common project management methodology?**

- a. Agile
- b. Waterfall
- c. Six Sigma
- d. All of the above

**Answer: d**

**What is the main purpose of project communication?**

- a. To keep stakeholders informed about project progress
- b. To identify and resolve project issues
- c. To manage project risks
- d. To manage project budget

**Answer: a**

## Lec 18 - Types of Joins

1. Which type of join returns only the matched rows?

- A) Inner join
- B) Left join
- C) Right join
- D) Full outer join

Answer: A) Inner join

Which type of join returns all the rows from the left table and matched rows from the right table?

- A) Inner join
- B) Left join
- C) Right join
- D) Full outer join

Answer: B) Left join

Which type of join returns all the rows from the right table and matched rows from the left table?

- A) Inner join
- B) Left join
- C) Right join
- D) Full outer join

Answer: C) Right join

Which type of join returns all the rows from both tables, matching where possible and returning null values where there are no matches?

- A) Inner join
- B) Left join
- C) Right join
- D) Full outer join

Answer: D) Full outer join

Which type of join is equivalent to the intersection of two sets?

- A) Inner join
- B) Left join
- C) Right join
- D) Full outer join

Answer: A) Inner join

Which type of join is equivalent to the union of two sets?

- A) Inner join
- B) Left join
- C) Right join
- D) Full outer join

Answer: D) Full outer join

Which type of join is used to find rows with no matching data in the joined tables?

- A) Inner join
- B) Left join

- C) Right join
- D) Full outer join

Answer: B) Left join

**Which type of join is used to find rows with missing data in one of the tables?**

- A) Inner join
- B) Left join
- C) Right join
- D) Full outer join

Answer: C) Right join

**Which type of join is used to combine tables without considering any conditions?**

- A) Inner join
- B) Left join
- C) Cross join
- D) Full outer join

Answer: C) Cross join

**Which type of join is used to combine tables based on multiple columns?**

- A) Inner join
- B) Left join
- C) Right join
- D) Composite join

Answer: D) Composite join (Note: Composite join is not a standard SQL join, but a term used to describe a join that combines tables based on multiple columns.)

## Lec 19 - Functional Dependency

### 1. What is functional dependency in a database?

- a) A relationship between two tables
- b) A relationship between two attributes or sets of attributes
- c) A method for sorting data
- d) A type of database query

Answer: b) A relationship between two attributes or sets of attributes

### Which of the following is an example of a functional dependency?

- a) A customer's name and their address
- b) A customer's name and their favorite color
- c) A customer's phone number and their email address
- d) A customer's age and their gender

Answer: c) A customer's phone number and their email address

### What does it mean if attribute B is functionally dependent on attribute A?

- a) The values in attribute A determine the values in attribute B
- b) The values in attribute B determine the values in attribute A
- c) The values in attribute A and B are independent of each other
- d) The values in attribute A and B are not related to each other

Answer: a) The values in attribute A determine the values in attribute B

### What is a determinant in a functional dependency?

- a) The attribute that determines another attribute's value
- b) The attribute that is determined by another attribute's value
- c) An attribute that is not related to any other attributes in a table
- d) An attribute that is related to all other attributes in a table

Answer: a) The attribute that determines another attribute's value

### Which normal form in database design involves removing partial dependencies?

- a) First normal form
- b) Second normal form
- c) Third normal form
- d) Fourth normal form

Answer: c) Third normal form

### In a functional dependency A → B, what does the symbol → represent?

- a) Addition
- b) Subtraction
- c) Multiplication
- d) Dependency

Answer: d) Dependency

### What is a transitive functional dependency?

- a) A dependency where one attribute determines another attribute
- b) A dependency where three or more attributes are related
- c) A dependency where an attribute determines another attribute through a third attribute
- d) A dependency where two attributes are unrelated to each other

Answer: c) A dependency where an attribute determines another attribute through a third

attribute

**Which of the following is an example of a partial dependency?**

- a) A customer's name and their address
- b) A customer's name and their favorite color
- c) A customer's phone number and their email address
- d) A customer's age and their gender

**Answer: b) A customer's name and their favorite color**

**Which normal form requires that every non-prime attribute is dependent on the primary key?**

- a) First normal form
- b) Second normal form
- c) Third normal form
- d) Fourth normal form

**Answer: b) Second normal form**

**Which normal form is the highest level of normalization?**

- a) First normal form
- b) Second normal form
- c) Third normal form
- d) Fourth normal form

**Answer: d) Fourth normal form**

## Lec 20 - Second Normal Form

### 1. What is Second Normal Form (2NF)?

- a. It is a database modeling technique to eliminate data redundancy
- b. It is a normalization concept that ensures all non-key attributes are dependent on the entire primary key
- c. It is a type of database join
- d. It is a database indexing technique

**Answer: b. It is a normalization concept that ensures all non-key attributes are dependent on the entire primary key.**

### Which of the following is a violation of Second Normal Form?

- a. A table has a composite primary key
- b. A table has a non-key attribute that depends on only part of the primary key
- c. A table has repeating groups of data
- d. A table has a single primary key attribute

**Answer: b. A table has a non-key attribute that depends on only part of the primary key.**

### What is the first step in achieving Second Normal Form?

- a. Eliminating data redundancy
- b. Defining a primary key for the table
- c. Removing null values from the table
- d. Applying functional dependencies to the table

**Answer: b. Defining a primary key for the table.**

### Which normal form is 2NF based on?

- a. First Normal Form (1NF)
- b. Third Normal Form (3NF)
- c. Fourth Normal Form (4NF)
- d. Fifth Normal Form (5NF)

**Answer: a. First Normal Form (1NF).**

### Which of the following is a benefit of Second Normal Form?

- a. Improved query performance
- b. Reduced data storage space
- c. Improved data integrity
- d. Increased data redundancy

**Answer: c. Improved data integrity.**

### Which type of dependency does Second Normal Form eliminate?

- a. Full dependency
- b. Partial dependency
- c. Transitive dependency
- d. Multivalued dependency

**Answer: b. Partial dependency.**

### Which of the following is an example of a violation of Second Normal Form?

- a. A table with a single primary key attribute
- b. A table with a composite primary key
- c. A table with a non-key attribute that depends on another non-key attribute

d. A table with a non-key attribute that depends on the entire primary key

**Answer: c. A table with a non-key attribute that depends on another non-key attribute.**

**What is the purpose of normalizing a database to Second Normal Form?**

a. To eliminate null values from the table

b. To eliminate data redundancy

c. To improve query performance

d. To increase data redundancy

**Answer: b. To eliminate data redundancy.**

**Which of the following is a characteristic of a table in Second Normal Form?**

a. Each non-key attribute is dependent on the entire primary key

b. Each non-key attribute is dependent on a part of the primary key

c. The table has repeating groups of data

d. The table has no primary key

**Answer: a. Each non-key attribute is dependent on the entire primary key.**

**What is the difference between First Normal Form (1NF) and Second Normal Form (2NF)?**

a. 1NF eliminates partial dependencies, while 2NF eliminates repeating groups

b. 1NF eliminates repeating groups, while 2NF eliminates partial dependencies

c. 1NF eliminates transitive dependencies, while 2NF eliminates partial dependencies

d. 1NF eliminates null values, while 2NF eliminates partial dependencies

**Answer: b. 1NF eliminates repeating groups, while 2NF eliminates partial dependencies.**



## Lec 21 - Normalization Summary

### 1. What is normalization?

- a. A process of organizing data in a database
- b. A process of inserting data in a database
- c. A process of deleting data from a database

Answer: a

### What is the main purpose of normalization?

- a. To increase data redundancy
- b. To decrease data redundancy
- c. To increase data anomalies

Answer: b

### Which of the following is not a common level of normalization?

- a. First Normal Form (1NF)
- b. Second Normal Form (2NF)
- c. Fourth Normal Form (4NF)

Answer: c

### What is the difference between First Normal Form (1NF) and Second Normal Form (2NF)?

- a. 1NF eliminates partial dependencies, 2NF eliminates repeating groups
- b. 1NF eliminates repeating groups, 2NF eliminates partial dependencies
- c. 1NF eliminates transitive dependencies, 2NF eliminates partial dependencies

Answer: b

### What is a repeating group?

- a. A group of attributes that are dependent on only part of the primary key
- b. A group of non-key attributes that are dependent on each other
- c. A group of key attributes that are dependent on each other

Answer: b

### What is a partial dependency?

- a. An attribute that is dependent on only part of the primary key
- b. An attribute that is dependent on the entire primary key
- c. An attribute that is dependent on a non-key attribute

Answer: a

### What is a transitive dependency?

- a. An attribute that is dependent on only part of the primary key
- b. An attribute that is dependent on the entire primary key
- c. An attribute that is dependent on another non-key attribute

Answer: c

### What is the benefit of normalization?

- a. Increased data redundancy
- b. Decreased data integrity
- c. Improved data integrity

Answer: c

### Can a database be over-normalized?

- a. Yes, it can result in slower performance and more complex database designs

- b. No, normalization always leads to improved database performance
- c. It depends on the size of the database

Answer: a

**What is an anomaly in a database?**

- a. A normal occurrence in a database
- b. A situation where data does not conform to the rules of normalization
- c. A situation where data is not entered correctly into a database

Answer: b

## Lec 22 - The Physical Database Design Considerations and Implementation

1. Which of the following is NOT a consideration when designing the physical database?

- a) Choosing the appropriate storage structures
- b) Backup and recovery strategies
- c) Logical relationships between entities
- d) File organizations

Answer: c) Logical relationships between entities

Which of the following storage structures is designed for fast data access and retrieval?

- a) Heap file
- b) Hash file
- c) B-tree file
- d) Sequential file

Answer: c) B-tree file

Which of the following indexing methods is designed for exact match queries?

- a) Hash index
- b) B-tree index
- c) Bitmap index
- d) Clustered index

Answer: a) Hash index

Which of the following file organizations is designed for fast retrieval of data in sorted order?

- a) Heap file
- b) Hash file
- c) B-tree file
- d) Sequential file

Answer: d) Sequential file

Which of the following partitioning techniques divides data based on ranges of values in a column?

- a) List partitioning
- b) Hash partitioning
- c) Range partitioning
- d) Round-robin partitioning

Answer: c) Range partitioning

Which of the following replication techniques involves writing to all copies of the database simultaneously?

- a) Snapshot replication
- b) Merge replication
- c) Transactional replication
- d) Peer-to-peer replication

Answer: d) Peer-to-peer replication

Which of the following backup strategies involves taking a complete backup of the database?

- a) Full backup

- b) Incremental backup
- c) Differential backup
- d) Copy backup

**Answer: a) Full backup**

**Which of the following recovery strategies involves restoring the database to a previous point in time?**

- a) Rollback
- b) Recovery
- c) Restart
- d) Checkpoint

**Answer: b) Recovery**

**Which of the following factors does NOT affect database performance?**

- a) Hardware
- b) Software
- c) User interface design
- d) Database design

**Answer: c) User interface design**

**Which of the following tools can be used to monitor database performance?**

- a) SQL Server Profiler
- b) SQL Server Management Studio
- c) SQL Server Configuration Manager
- d) SQL Server Data Tools

**Answer: a) SQL Server Profiler**

