# **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

#### **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

#### 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

## Lec 23 - Physical Record and De-normalization

#### 1. What is a physical record?

- a) The conceptual model of a database
- b) The actual data stored in a database on disk
- c) The logical model of a database
- d) The metadata associated with a database

Answer: b) The actual data stored in a database on disk

#### What is denormalization?

- a) The process of breaking normal form rules in a database to improve performance
- b) The process of improving the normalization of a database
- c) The process of removing redundant data from a database
- d) The process of optimizing database queries

Answer: a) The process of breaking normal form rules in a database to improve performance

#### What is the purpose of denormalization?

- a) To reduce the complexity of database queries
- b) To improve database performance
- c) To simplify the database design
- d) To increase data consistency in a database

Answer: b) To improve database performance

#### What are the risks of denormalization?

- a) Data redundancy and inconsistency
- b) Database performance degradation
- c) Increased query complexity
- d) All of the above

Answer: d) All of the above

#### What is data redundancy?

- a) The process of breaking normal form rules in a database to improve performance
- b) The duplication of data in a database
- c) The process of normalizing a database
- d) The metadata associated with a database

Answer: b) The duplication of data in a database

#### Which normal form does denormalization violate?

- a) First Normal Form
- b) Second Normal Form
- c) Third Normal Form
- d) Fourth Normal Form

Answer: c) Third Normal Form

#### What is the primary goal of normalization?

- a) To eliminate data redundancy
- b) To improve database performance
- c) To simplify the database design
- d) To increase data inconsistency in a database

Answer: a) To eliminate data redundancy

#### Which of the following is a disadvantage of denormalization?

a) Reduced query complexity

- b) Increased data redundancy
- c) Improved database performance
- d) Simplified database design

Answer: b) Increased data redundancy

## What is the consequence of data inconsistency?

- a) Increased query performance
- b) Improved data quality
- c) Increased risk of errors and inaccuracies
- d) Simplified database design

Answer: c) Increased risk of errors and inaccuracies

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

- a) Combining two tables into one
- b) Normalizing a database
- c) Adding a new column to a table
- d) Creating a new index on a table

Answer: a) Combining two tables into one

## Lec 24 - Vertical Partitioning

#### 1. What is vertical partitioning in a database?

- A) Dividing tables horizontally
- B) Dividing tables vertically
- C) Dividing data into multiple databases
- D) None of the above

Answer: B) Dividing tables vertically

## Which of the following is a benefit of vertical partitioning?

- A) Improved data redundancy
- B) Improved data consistency
- C) Improved query performance
- D) Reduced storage space

Answer: C) Improved query performance

#### What is another name for vertical partitioning?

- A) Row partitioning
- B) Column partitioning
- C) Table partitioning
- D) None of the above

Answer: B) Column partitioning

#### When is vertical partitioning particularly useful?

- A) When a database contains a large number of rows
- B) When a database contains a small number of columns
- C) When certain columns are accessed more frequently than others
- D) When a database is used for infrequent data access

Answer: C) When certain columns are accessed more frequently than others

#### Which of the following is a potential drawback of vertical partitioning?

- A) Increased storage space
- B) Reduced guery performance
- C) Increased data redundancy
- D) Reduced data consistency

Answer: A) Increased storage space

#### What is the main goal of vertical partitioning?

- A) To improve data redundancy
- B) To improve query performance
- C) To improve data consistency
- D) To reduce storage space

Answer: B) To improve query performance

#### Which of the following is an example of vertical partitioning?

- A) Splitting a table into multiple tables based on a date range
- B) Splitting a table into multiple tables based on location
- C) Splitting a table into multiple tables based on column values
- D) None of the above

Answer: C) Splitting a table into multiple tables based on column values

#### What is a potential challenge of managing a vertically partitioned database?

A) Ensuring data consistency across partitions

- B) Managing large amounts of data within a single table
- C) Maintaining sufficient storage capacity
- D) None of the above

Answer: A) Ensuring data consistency across partitions

#### Which of the following is a benefit of vertical partitioning in a distributed database?

- A) Improved query performance
- B) Improved data redundancy
- C) Improved data consistency
- D) None of the above

Answer: A) Improved query performance

#### What is a key consideration when deciding whether to use vertical partitioning?

- A) The number of rows in the database
- B) The number of columns in the database
- C) The access patterns for the data
- D) The amount of available storage space

Answer: C) The access patterns for the data

## **Lec 25 - Rules of SQL Format**

#### 1. What is the recommended way to format SQL keywords in a query?

- a) All lowercase
- b) All uppercase
- c) Capitalize only the first letter
- d) It doesn't matter

Answer: b) All uppercase

### What is the recommended way to format table and column aliases in a query?

- a) Use short, cryptic aliases to save space
- b) Use long, descriptive aliases to make the code more readable
- c) Don't use aliases at all
- d) It doesn't matter

Answer: b) Use long, descriptive aliases to make the code more readable

#### What is the recommended way to format subqueries in a query?

- a) Include them within the main query on a single line
- b) Break them out into separate, indented lines
- c) Don't use subqueries
- d) It doesn't matter

Answer: b) Break them out into separate, indented lines

#### What is the recommended way to format the SELECT clause in a query?

- a) Include all columns on a single line
- b) Break the columns out into separate lines
- c) Use a combination of both, depending on the length of the guery
- d) It doesn't matter

Answer: b) Break the columns out into separate lines

#### What is the recommended way to format the FROM clause in a query?

- a) Include all tables on a single line
- b) Break the tables out into separate lines
- c) Use a combination of both, depending on the length of the query
- d) It doesn't matter

Answer: b) Break the tables out into separate lines

#### What is the recommended way to format the WHERE clause in a query?

- a) Include all conditions on a single line
- b) Break the conditions out into separate, indented lines
- c) Don't use the WHERE clause
- d) It doesn't matter

Answer: b) Break the conditions out into separate, indented lines

#### What is the recommended way to format comments in SQL code?

- a) Use single-line comments starting with #
- b) Use multi-line comments starting with /\*
- c) Use both single-line and multi-line comments, depending on the context
- d) It doesn't matter

Answer: c) Use both single-line and multi-line comments, depending on the context

What is the recommended way to format keywords in a query that are not SQL

#### keywords?

- a) Use all lowercase
- b) Use all uppercase
- c) Capitalize only the first letter
- d) It doesn't matter

Answer: a) Use all lowercase

### What is the recommended way to format a JOIN clause in a query?

- a) Include all tables on a single line
- b) Break the tables out into separate lines
- c) Use a combination of both, depending on the length of the query
- d) It doesn't matter

Answer: b) Break the tables out into separate lines

#### What is the recommended way to format a GROUP BY clause in a query?

- a) Include all columns on a single line
- b) Break the columns out into separate lines
- c) Use a combination of both, depending on the length of the query
- d) It doesn't matter

Answer: b) Break the columns out into separate lines

## **Lec 26 - Categories of SQL Commands**

## 1. Which category of SQL commands is used to define and modify database objects such as tables and indexes?

- A. Data Manipulation Language (DML)
- B. Data Definition Language (DDL)
- C. Data Control Language (DCL)
- D. Transaction Control Language (TCL)

Answer: B

## Which category of SQL commands is used to manipulate data in database objects?

- A. Data Manipulation Language (DML)
- B. Data Definition Language (DDL)
- C. Data Control Language (DCL)
- D. Transaction Control Language (TCL)

Answer: A

## Which category of SQL commands is used to control access to the database?

- A. Data Manipulation Language (DML)
- B. Data Definition Language (DDL)
- C. Data Control Language (DCL)
- D. Transaction Control Language (TCL)

**Answer: C** 

## Which category of SQL commands is used to manage transactions and ensure data consistency?

- A. Data Manipulation Language (DML)
- B. Data Definition Language (DDL)
- C. Data Control Language (DCL)
- D. Transaction Control Language (TCL)

Answer: D

## Which SQL command falls under the DDL category?

A. SELECT

B. UPDATE

C. INSERT

D. CREATE

**Answer: D** 

#### Which SQL command falls under the DML category?

A. ALTER

B. DELETE

C. DROP

D. GRANT

Answer: B

## Which SQL command falls under the DCL category?

- A. UPDATE
- **B. REVOKE**
- C. INSERT

# D. DELETE Answer: B

## Which SQL command falls under the TCL category?

A. COMMIT

**B. SELECT** 

C. WHERE

D. FROM

Answer: A

## Which SQL command is used to create a new table in a database?

A. INSERT

B. UPDATE

C. DELETE

D. CREATE

**Answer: D** 

## Which SQL command is used to add a new row of data to an existing table?

A. DELETE

**B. INSERT** 

C. UPDATE

D. ALTER

Answer: B

#### Lec 27 - Alter Table Statement

- 1. Which SQL command is used to modify the structure of an existing table?
  - a. SELECT
  - b. INSERT
  - c. UPDATE
  - d. ALTER TABLE

#### Answer: d. ALTER TABLE

#### What is the purpose of the ALTER TABLE statement in SQL?

- a. To create a new table
- b. To delete a table
- c. To modify the structure of an existing table
- d. To insert data into a table

#### Answer: c. To modify the structure of an existing table

## Which keyword is used to add a new column to an existing table using the ALTER TABLE statement?

- a. ADD
- b. MODIFY
- c. DROP
- d. RENAME

#### Answer: a. ADD

## Which keyword is used to modify the data type of a column using the ALTER TABLE statement?

- a. ADD
- b. MODIFY
- c. DROP
- d. RENAME

#### Answer: b. MODIFY

## Which keyword is used to delete a column from an existing table using the ALTER TABLE statement?

- a. ADD
- b. MODIFY
- c. DROP
- d. RENAME

#### Answer: c. DROP

#### Which keyword is used to rename an existing table using the ALTER TABLE statement?

- a. ADD
- b. MODIFY
- c. DROP
- d. RENAME

#### Answer: d. RENAME

## Which keyword is used to set a primary key constraint on a column using the ALTER TABLE statement?

a. PRIMARY KEY

- b. FOREIGN KEY
- c. UNIQUE
- d. CHECK

#### Answer: a. PRIMARY KEY

Which keyword is used to add a foreign key constraint to an existing table using the ALTER TABLE statement?

- a. PRIMARY KEY
- b. FOREIGN KEY
- c. UNIQUE
- d. CHECK

Answer: b. FOREIGN KEY

Which keyword is used to set a unique constraint on a column using the ALTER TABLE statement?

- a. PRIMARY KEY
- b. FOREIGN KEY
- c. UNIQUE
- d. CHECK

Answer: c. UNIQUE

Which keyword is used to add a check constraint to an existing table using the ALTER TABLE statement?

- a. PRIMARY KEY
- b. FOREIGN KEY
- c. UNIQUE
- d. CHECK

Answer: d. CHECK

#### Lec 28 - Attribute Allias

#### 1. What is attribute aliasing?

- a) A technique for renaming tables in a database
- b) The practice of giving multiple names to the same attribute in a database
- c) The process of aggregating data from multiple sources
- d) The use of machine learning algorithms to identify data patterns

Answer: b) The practice of giving multiple names to the same attribute in a database

### What is the potential risk of attribute aliasing?

- a) Inaccurate data analysis
- b) Increased data security
- c) Faster query processing
- d) Improved data quality

Answer: a) Inaccurate data analysis

#### How can attribute aliasing be mitigated?

- a) By renaming all attributes in a database
- b) By documenting attribute aliases and ensuring consistency
- c) By removing all attribute aliases from a database
- d) By using a different database management system

Answer: b) By documenting attribute aliases and ensuring consistency

#### What is the impact of inconsistent attribute aliases?

- a) Faster query processing
- b) Improved data quality
- c) Confusion and errors when querying data
- d) More accurate data analysis

Answer: c) Confusion and errors when querying data

#### How can attribute aliases be managed effectively?

- a) By allowing users to create their own aliases
- b) By using different attribute names for different users
- c) By defining standard attribute names and enforcing them
- d) By allowing attribute aliases to be randomly generated

Answer: c) By defining standard attribute names and enforcing them

#### What is the role of data governance in attribute aliasing?

- a) To create more attribute aliases
- b) To remove all attribute aliases from a database
- c) To document attribute aliases and enforce consistency
- d) To randomly generate attribute aliases

Answer: c) To document attribute aliases and enforce consistency

#### What is the difference between an alias and a synonym?

- a) They are interchangeable terms
- b) An alias is a temporary name, while a synonym is a permanent name
- c) An alias is a name for a table, while a synonym is a name for a column
- d) An alias is a name for an attribute, while a synonym is a name for a table or view

Answer: d) An alias is a name for an attribute, while a synonym is a name for a table or view

## Which of the following is an example of attribute aliasing?

a) Using different attribute names in different databases

- b) Renaming a column in a table
- c) Combining data from multiple tables
- d) Creating a new database from scratch

#### Answer: b) Renaming a column in a table

## How can attribute aliases affect data integration?

- a) By improving data integration
- b) By causing data integration to fail
- c) By speeding up data integration
- d) By reducing the need for data integration

Answer: b) By causing data integration to fail

#### What is the primary goal of managing attribute aliases?

- a) To increase data security
- b) To improve query performance
- c) To ensure consistency and accuracy in data analysis
- d) To reduce the amount of data stored in a database

Answer: c) To ensure consistency and accuracy in data analysis

## Lec 29 - Data Manipulation Language

- 1. Which of the following DML command is used to insert new data into a table?
  - a) SELECT
  - b) INSERT
  - c) UPDATE
  - d) DELETE

#### Solution: b) INSERT

Which DML command is used to retrieve data from a table?

- a) INSERT
- b) UPDATE
- c) DELETE
- d) SELECT

### Solution: d) SELECT

Which DML command is used to modify existing data in a table?

- a) INSERT
- b) UPDATE
- c) DELETE
- d) SELECT

#### Solution: b) UPDATE

Which DML command is used to delete data from a table?

- a) INSERT
- b) UPDATE
- c) DELETE
- d) SELECT

#### Solution: c) DELETE

Which of the following is not a type of SQL join used in DML?

- a) INNER JOIN
- b) OUTER JOIN
- c) UNION JOIN
- d) FULL OUTER JOIN

#### Solution: c) UNION JOIN

Which DML command is used to add a new column to an existing table?

- a) ADD COLUMN
- b) INSERT COLUMN
- c) UPDATE COLUMN
- d) ALTER TABLE

#### Solution: d) ALTER TABLE

Which DML command is used to rename an existing table?

a) RENAME TABLE

- b) UPDATE TABLE
- c) ALTER TABLE
- d) MODIFY TABLE

### Solution: a) RENAME TABLE

Which DML command is used to change the data type of an existing column in a table?

- a) MODIFY COLUMN
- b) CHANGE COLUMN
- c) ALTER COLUMN
- d) UPDATE COLUMN

## Solution: c) ALTER COLUMN

Which of the following is not a valid data type in SQL used in DML?

- a) FLOAT
- b) BOOLEAN
- c) DECIMAL
- d) ARRAY

Solution: d) ARRAY

Which DML command is used to update multiple rows in a table at once?

- a) UPDATE
- b) INSERT
- c) DELETE
- d) REPLACE

Solution: a) UPDATE

#### Lec 30 - ORDER BY Clause

#### 1. What is the purpose of the ORDER BY clause in SQL?

- A) To filter data based on specific criteria
- B) To group data based on specific columns
- C) To sort data in ascending or descending order
- D) To combine data from two or more tables

Answer: C) To sort data in ascending or descending order

#### Which keyword is used in the ORDER BY clause to sort data in descending order?

- A) DESC
- B) ASC
- C) ORDER
- D) BY

Answer: A) DESC

#### Can the ORDER BY clause be used with the SELECT statement?

- A) Yes
- B) No

Answer: A) Yes

#### Which clause comes after the ORDER BY clause in a SELECT statement?

- A) FROM
- B) WHERE
- C) GROUP BY
- D) HAVING

## Answer: LIMIT or OFFSET clauses, but if they're not used then the query ends after ORDER BY clause.

#### What is the default sorting order used by ORDER BY clause in SQL?

- A) Descending order
- B) Ascending order
- C) No default sorting order
- D) Random order

#### Answer: B) Ascending order

#### Can multiple columns be used in the ORDER BY clause?

- A) Yes
- B) No

Answer: A) Yes

#### Which operator is used to separate multiple columns in the ORDER BY clause?

- A) AND
- B) OR
- C) COMMA
- D) COLON

#### Answer: C) COMMA

#### What is the use of the NULLS FIRST keyword in the ORDER BY clause?

A) It sorts NULL values first in the result set.

- B) It sorts NULL values last in the result set.
- C) It is not a valid keyword in the ORDER BY clause.
- D) It has no effect on the sorting of NULL values.

Answer: A) It sorts NULL values first in the result set.

#### Can an alias name be used in the ORDER BY clause?

A) Yes

B) No

Answer: A) Yes

## Can a subquery be used in the ORDER BY clause?

A) Yes

B) No

Answer: B) No

#### Lec 31 - Inner Join

#### 1. What is the purpose of an Inner Join in SQL?

- a. To combine all rows from two tables
- b. To combine matching rows from two tables
- c. To combine non-matching rows from two tables
- d. None of the above

#### Answer: b. To combine matching rows from two tables

#### What is the syntax for an Inner Join in SQL?

- a. SELECT \* FROM table1, table2 WHERE table1.column = table2.column
- b. SELECT \* FROM table1 JOIN table2 ON table1.column = table2.column
- c. SELECT \* FROM table1 INNER JOIN table2 ON table1.column = table2.column
- d. Both b and c

#### Answer: d. Both b and c

#### Which of the following types of join can result in NULL values?

- a. Inner Join
- b. Left Join
- c. Right Join
- d. Full Outer Join

#### Answer: d. Full Outer Join

## In an Inner Join, what happens if there are duplicate values in the matching columns?

- a. Only one row is returned for each duplicate value
- b. All rows with duplicate values are returned
- c. An error is thrown
- d. None of the above

#### Answer: b. All rows with duplicate values are returned

#### Which of the following is an example of an Inner Join condition?

- a. table1.column1 = table2.column2
- b. table1.column1 <> table2.column2
- c. table1.column1 > table2.column2
- d. Both b and c

#### Answer: a. table1.column1 = table2.column2

#### In an Inner Join, what is the result if there are no matching values in either table?

- a. All rows from both tables are returned
- b. No rows are returned
- c. Only the rows from the first table are returned
- d. Only the rows from the second table are returned

#### Answer: b. No rows are returned

#### What is the difference between an Inner Join and a Left Join?

- a. Inner Join returns only matching rows, while Left Join returns all rows from the left table and matching rows from the right table
- b. Inner Join returns all rows from both tables, while Left Join returns only matching rows
- c. Inner Join and Left Join are the same thing
- d. None of the above

Answer: a. Inner Join returns only matching rows, while Left Join returns all rows from the left

#### table and matching rows from the right table

Which of the following keywords is used in an Inner Join to specify the columns to join on?

- a. ON
- b. WHERE
- c. JOIN
- d. FROM

Answer: a. ON

Which of the following operators is used in an Inner Join to combine multiple conditions?

- a. AND
- b. OR
- c. NOT
- d. XOR

Answer: a. AND

Which of the following statements is true about the order of tables in an Inner Join?

- a. The order does not matter
- b. The first table listed is always the left table
- c. The second table listed is always the right table
- d. Both b and c

Answer: a. The order does not matter.

## Lec 32 - Application Programs

#### 1. Which of the following is an example of an application program?

- a) Microsoft Windows operating system
- b) Google Chrome web browser
- c) Apache web server
- d) Python programming language

Answer: b) Google Chrome web browser

### Which type of application program is used for creating and editing documents?

- a) Database management system
- b) Word processor
- c) Spreadsheet program
- d) Graphics software

Answer: b) Word processor

## Which of the following is not an example of an application program?

- a) Microsoft Office Suite
- b) Adobe Photoshop
- c) Linux operating system
- d) QuickBooks accounting software

Answer: c) Linux operating system

## Which type of application program is used for managing and organizing data?

- a) Word processor
- b) Database management system
- c) Web browser
- d) Media player

Answer: b) Database management system

#### Which type of application program is used for creating and delivering presentations?

- a) Graphics software
- b) Web browser
- c) Presentation software
- d) Video editing software

Answer: c) Presentation software

#### Which of the following is an example of open-source application software?

- a) Microsoft Office Suite
- b) Adobe Photoshop
- c) GIMP image editor
- d) Oracle Database

Answer: c) GIMP image editor

# Which type of application program is used for performing complex mathematical calculations and analysis?

- a) Word processor
- b) Database management system
- c) Spreadsheet program
- d) Graphics software

Answer: c) Spreadsheet program

#### Which of the following is an example of proprietary application software?

a) Apache web server

- b) Linux operating system
- c) QuickBooks accounting software
- d) GIMP image editor

## Answer: c) QuickBooks accounting software

## Which type of application program is used for managing and organizing email?

- a) Web browser
- b) Media player
- c) Email client
- d) Presentation software

#### Answer: c) Email client

#### Which of the following is an example of an educational application program?

- a) Adobe Photoshop
- b) Microsoft Office Suite
- c) Moodle learning management system
- d) QuickBooks accounting software

Answer: c) Moodle learning management system

## Lec 33 - Designing Input Form

#### 1. Which of the following is not a consideration when designing an input form?

- a) User needs
- b) Interface design principles
- c) Number of fields
- d) Security measures

#### Answer: c

#### What is the purpose of clear labels in an input form?

- a) To make the form look more attractive
- b) To confuse the user
- c) To provide guidance to the user
- d) None of the above

#### Answer: c

## Which of the following should be provided for form fields where necessary?

- a) Validation
- b) Error messages
- c) Both a and b
- d) None of the above

#### Answer: c

#### What is the benefit of optimizing an input form for mobile devices?

- a) Increased user engagement
- b) Improved accessibility
- c) Higher conversion rates
- d) All of the above

#### Answer: d

#### What is the purpose of security measures in an input form?

- a) To protect user data
- b) To make the form look more professional
- c) To slow down form submission
- d) None of the above

#### Answer: a

#### Which of the following is not a principle of interface design?

- a) Consistency
- b) Simplicity
- c) Complexity
- d) Clarity

#### Answer: c

#### What is the purpose of appropriate sizing and spacing of form fields?

- a) To make the form look more attractive
- b) To improve usability
- c) To confuse the user
- d) None of the above

#### Answer: b

## Which of the following is not a benefit of a well-designed input form?

a) Improved user experience

- b) Increased accuracy of data collection
- c) Decreased loading time
- d) All of the above

#### Answer: c

## Which of the following should be optimized in an input form for accessibility?

- a) Color contrast
- b) Font size
- c) Keyboard accessibility
- d) All of the above

#### Answer: d

#### What is the benefit of providing real-time feedback on form submission?

- a) Increased user engagement
- b) Improved user experience
- c) Higher conversion rates
- d) All of the above

Answer: d

## Lec 34 - Data Storage Concepts

#### 1. Which of the following is an example of structured data storage?

- A) Relational database
- B) Cloud storage
- C) Object storage
- D) NoSQL database

Answer: A

#### Which type of database allows for flexible and scalable data storage?

- A) Relational database
- B) Object-oriented database
- C) NoSQL database
- D) Hierarchical database

**Answer: C** 

#### Which of the following is a disadvantage of using tape storage for backup?

- A) It is expensive
- B) It is not durable
- C) It has slow access times
- D) It requires regular maintenance

**Answer: C** 

#### Which type of storage is ideal for storing large amounts of unstructured data?

- A) Block storage
- B) File storage
- C) Object storage
- D) Cache storage

**Answer: C** 

## Which of the following is a cloud storage provider?

- A) Oracle
- B) Amazon Web Services
- C) SAP
- D) IBM

Answer: B

#### Which of the following is an example of primary storage?

- A) Hard disk drive
- B) USB flash drive
- C) Magnetic tape
- D) RAM

**Answer: D** 

## Which of the following is a benefit of using RAID (redundant array of independent disks) for data storage?

- A) Faster data access times
- B) Increased data security
- C) Lower cost
- D) More efficient data backup

Answer: B

## Which of the following is a common data storage protocol?

- B) FTP
- C) SMTP
- D) TCP/IP

#### **Answer: B**

# Which of the following is a benefit of using a content delivery network (CDN) for data storage?

- A) Faster data access times
- B) Lower cost
- C) More efficient backup and recovery
- D) Increased data security

#### Answer: A

## Which of the following is a common backup and recovery method?

- A) RAID
- B) Tape backup
- C) Cloud storage
- D) Object storage

#### Answer: B

## Lec 35 - File Organizations

- 1. Which of the following file organizations is suitable for storing large amounts of data that need to be accessed in a sequential manner?
  - a) Sequential organization
  - b) Direct organization
  - c) Indexed organization
  - d) Hashed organization

Answer: a) Sequential organization

# Which of the following file organizations is best suited for storing data that is frequently accessed randomly?

- a) Sequential organization
- b) Direct organization
- c) Indexed organization
- d) Hashed organization

Answer: b) Direct organization

## In which of the following file organizations is data accessed using a key value?

- a) Sequential organization
- b) Direct organization
- c) Indexed organization
- d) Hashed organization

Answer: c) Indexed organization

## Which of the following file organizations allows for faster access to data by using a hash function?

- a) Sequential organization
- b) Direct organization
- c) Indexed organization
- d) Hashed organization

Answer: d) Hashed organization

#### Which of the following file organizations requires the least amount of storage space?

- a) Sequential organization
- b) Direct organization
- c) Indexed organization
- d) Hashed organization

#### Answer: a) Sequential organization

### Which of the following file organizations provides the fastest access to data?

- a) Sequential organization
- b) Direct organization
- c) Indexed organization
- d) Hashed organization

#### Answer: d) Hashed organization

## Which of the following file organizations can be used for both sequential and random access to data?

a) Sequential organization

- b) Direct organization
- c) Indexed organization
- d) Hashed organization

Answer: c) Indexed organization

# Which of the following file organizations is not suitable for storing data that needs to be accessed randomly?

- a) Sequential organization
- b) Direct organization
- c) Indexed organization
- d) Hashed organization

Answer: a) Sequential organization

# Which of the following file organizations provides faster access to data than sequential organization but slower than direct organization?

- a) Sequential organization
- b) Direct organization
- c) Indexed organization
- d) Hashed organization

Answer: c) Indexed organization

## Which of the following file organizations provides a balance between storage space and access time?

- a) Sequential organization
- b) Direct organization
- c) Indexed organization
- d) Hashed organization

Answer: b) Direct organization

## Lec 36 - Hashing

#### 1. What is hashing?

- a) The process of encrypting data
- b) The process of converting data into a fixed-length value or key
- c) The process of compressing data
- d) The process of obfuscating data

Answer: b

#### What is a hash function?

- a) A function that converts data into a fixed-length value or key
- b) A function that compresses data
- c) A function that encrypts data
- d) A function that obfuscates data

Answer: a

#### What is the purpose of a hash function?

- a) To convert data into a fixed-length value or key
- b) To compress data
- c) To encrypt data
- d) To obfuscate data

Answer: a

## Which of the following is an example of a hash algorithm?

- a) MD5
- b) RSA
- c) AES
- d) DES

Answer: a

#### What is a hash collision?

- a) When two different inputs produce the same hash output
- b) When a hash function fails to produce a fixed-length value or key
- c) When a hash function is too slow
- d) When a hash function is too complex

Answer: a

#### Which of the following is an advantage of hashing?

- a) Hashing allows for easy reverse engineering of data
- b) Hashing provides secure encryption of data
- c) Hashing provides a fixed-length representation of data
- d) Hashing compresses data to save storage space

Answer: c

## Which of the following is a common use case for hashing?

- a) Digital signatures
- b) Image compression
- c) Audio encoding
- d) Video transcoding

Answer: a

#### What is a rainbow table?

a) A precomputed table of hash values and corresponding input data

- b) A method of decrypting hashed data
- c) A type of hash function
- d) A method of obfuscating data

#### Answer: a

# Which of the following is a potential issue with using hash functions for password storage?

- a) Hash collisions
- b) Slow computation time
- c) Hash cracking through brute force attacks
- d) None of the above

#### Answer: c

## Which of the following is a way to mitigate the issue of hash cracking through brute force attacks?

- a) Using a stronger hash algorithm
- b) Salting the password before hashing
- c) Increasing the size of the hash value
- d) All of the above

Answer: b

### Lec 37 - Index

### 1. What is an index in a database?

- a) A list of all data in the database
- b) A data structure used to improve data retrieval
- c) A backup of the entire database
- d) A list of all gueries run on the database

Answer: b) A data structure used to improve data retrieval

## Which of the following is a common type of database index?

- a) Binary search tree
- b) Linked list
- c) Queue
- d) Stack

Answer: a) Binary search tree

### What is the purpose of an index in a search engine?

- a) To improve the relevance of search results
- b) To speed up the retrieval of search results
- c) To store all search queries
- d) To store all web pages on the internet

Answer: b) To speed up the retrieval of search results

# In a database, what is a primary key index?

- a) An index that contains all data in the database
- b) An index that includes only unique values of a particular column
- c) An index that contains a copy of the entire database
- d) An index that is used to store backup data

Answer: b) An index that includes only unique values of a particular column

### Which of the following is a disadvantage of using indexes in a database?

- a) Improved data retrieval performance
- b) Increased storage requirements
- c) Increased security risks
- d) Reduced data consistency

Answer: b) Increased storage requirements

### What is an inverted index used for?

- a) Indexing databases
- b) Indexing search engines
- c) Indexing file systems
- d) Indexing social media platforms

Answer: b) Indexing search engines

#### What is a clustered index in a database?

- a) An index that stores data in a specific order based on a particular column
- b) An index that stores all data in the database
- c) An index that includes only unique values of a particular column
- d) An index that is used to store backup data

Answer: a) An index that stores data in a specific order based on a particular column

### What is a non-clustered index in a database?

a) An index that stores data in a specific order based on a particular column

- b) An index that stores all data in the database
- c) An index that includes only unique values of a particular column
- d) An index that is used to store backup data

Answer: c) An index that includes only unique values of a particular column

# Which of the following is a common type of file system index?

- a) Binary search tree
- b) Linked list
- c) Queue
- d) Stack

Answer: b) Linked list

### What is a hash index used for?

- a) Indexing databases
- b) Indexing search engines
- c) Indexing file systems
- d) Indexing social media platforms

Answer: a) Indexing databases

### Lec 38 - Ordered Indices

### 1. What are ordered indices?

- A. A type of index used to store data in random order.
- B. A type of index used to store data in a specific order based on one or more columns.
- C. A type of index used only for range queries.
- D. A type of index that is not commonly used in databases.

**Answer: B** 

## Which data structure is commonly used to implement ordered indices?

- A. Hash table
- B. Linked list
- C. B-tree
- D. Queue

**Answer: C** 

# What is the primary benefit of using an ordered index?

- A. Improved data consistency
- B. Reduced storage requirements
- C. Faster data retrieval based on specific column values
- D. Improved data security

Answer: C

# Can multiple ordered indices be created on the same table in a database?

A. Yes

B. No

Answer: A

### What is a clustered index in a database?

- A. An index used to store data in random order
- B. An index used to store data in a specific order based on one or more columns
- C. An index used only for range queries
- D. An index that is not commonly used in databases

**Answer: B** 

### What is the difference between a primary key index and a clustered index?

- A. There is no difference.
- B. A primary key index includes only unique values, while a clustered index can include duplicates.
- C. A primary key index is used to ensure data consistency and integrity, while a clustered index is used for fast retrieval of data in a specific order.
- D. A primary key index is used for range queries, while a clustered index is used for specific value queries.

Answer: C

### What is the downside of using too many ordered indices in a database?

- A. Increased storage requirements
- B. Slower data retrieval performance
- C. Increased data inconsistency
- D. Decreased data security

Answer: A

### What is a composite index in a database?

A. An index used to store data in random order

- B. An index used to store data in a specific order based on one column only
- C. An index used to store data in a specific order based on multiple columns
- D. An index used only for range queries

**Answer: C** 

# Can an ordered index be used for sorting data?

A. Yes

B. No

Answer: A

# What is the most common type of data structure used to implement ordered indices?

- A. Hash table
- B. Linked list
- C. B-tree
- D. Queue

**Answer: C** 

### Lec 39 - Introduction to Views

- What is a view in a database?
  - a) A physical table
  - b) A virtual table
  - c) A temporary table
  - d) A backup table

Answer: b) A virtual table

How is a view created in a database?

- a) By defining a CREATE TABLE statement
- b) By defining a SELECT statement as a table
- c) By defining a DELETE statement as a table
- d) By defining an ALTER statement as a table

Answer: b) By defining a SELECT statement as a table

What is the purpose of a view in a database?

- a) To display data from multiple tables
- b) To provide an additional layer of security
- c) To simplify complex queries
- d) All of the above

Answer: d) All of the above

Can a view be modified in a database?

- a) Yes, using the ALTER VIEW statement
- b) No, once it has been created it cannot be modified
- c) Yes, using the DROP VIEW statement
- d) No, it can only be dropped and recreated

Answer: a) Yes, using the ALTER VIEW statement

How does a view differ from a table in a database?

- a) A view is a physical table, while a table is a virtual table
- b) A view is a virtual table, while a table is a physical table
- c) A view can be modified, while a table cannot
- d) A view is a backup of a table

Answer: b) A view is a virtual table, while a table is a physical table

Can a view be used to enforce data constraints in a database?

- a) Yes, using the CHECK constraint
- b) No, views cannot enforce data constraints
- c) Yes, using the FOREIGN KEY constraint
- d) No, only tables can enforce data constraints

Answer: b) No, views cannot enforce data constraints

How does a view improve security in a database?

- a) By allowing users to access only the data they are authorized to see
- b) By encrypting all data in the database
- c) By preventing users from accessing any data in the database
- d) By providing a backup of all data in the database

Answer: a) By allowing users to access only the data they are authorized to see

Can a view be used in a JOIN operation in a database?

- a) Yes, views can be used in JOIN operations
- b) No, views cannot be used in JOIN operations
- c) Only if the view is created from a single table
- d) Only if the view is created from multiple tables

Answer: a) Yes, views can be used in JOIN operations

How does a view affect performance in a database?

- a) Views can improve performance by simplifying complex queries
- b) Views can degrade performance by adding an additional layer of complexity
- c) Views have no impact on performance
- d) Views can improve performance by speeding up data retrieval

Answer: b) Views can degrade performance by adding an additional layer of complexity

How is a view dropped in a database?

- a) By using the DROP TABLE statement
- b) By using the DELETE VIEW statement
- c) By using the ALTER VIEW statement
- d) By using the DROP VIEW statement

Answer: d) By using the DROP VIEW statement

# **Lec 40 - Introduction to Views part-2**

### 1. What is a view in a database?

- a) A physical table
- b) A virtual table
- c) A temporary table
- d) A backup table

Answer: b) A virtual table

### How is a view created in a database?

- a) By defining a CREATE TABLE statement
- b) By defining a SELECT statement as a table
- c) By defining a DELETE statement as a table
- d) By defining an ALTER statement as a table

Answer: b) By defining a SELECT statement as a table

### What is the purpose of a view in a database?

- a) To display data from multiple tables
- b) To provide an additional layer of security
- c) To simplify complex queries
- d) All of the above

Answer: d) All of the above

### Can a view be modified in a database?

- a) Yes, using the ALTER VIEW statement
- b) No, once it has been created it cannot be modified
- c) Yes, using the DROP VIEW statement
- d) No, it can only be dropped and recreated

Answer: a) Yes, using the ALTER VIEW statement

### How does a view differ from a table in a database?

- a) A view is a physical table, while a table is a virtual table
- b) A view is a virtual table, while a table is a physical table
- c) A view can be modified, while a table cannot
- d) A view is a backup of a table

Answer: b) A view is a virtual table, while a table is a physical table

### Can a view be used to enforce data constraints in a database?

- a) Yes, using the CHECK constraint
- b) No, views cannot enforce data constraints
- c) Yes, using the FOREIGN KEY constraint
- d) No, only tables can enforce data constraints

Answer: b) No, views cannot enforce data constraints

# How does a view improve security in a database?

- a) By allowing users to access only the data they are authorized to see
- b) By encrypting all data in the database
- c) By preventing users from accessing any data in the database
- d) By providing a backup of all data in the database

Answer: a) By allowing users to access only the data they are authorized to see

# Can a view be used in a JOIN operation in a database?

a) Yes, views can be used in JOIN operations

- b) No, views cannot be used in JOIN operations
- c) Only if the view is created from a single table
- d) Only if the view is created from multiple tables

Answer: a) Yes, views can be used in JOIN operations

## How does a view affect performance in a database?

- a) Views can improve performance by simplifying complex queries
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Answer: b) Views can degrade performance by adding an additional layer of complexity

## How is a view dropped in a database?

- a) By using the DROP TABLE statement
- b) By using the DELETE VIEW statement
- c) By using the ALTER VIEW statement
- d) By using the DROP VIEW statement

Answer: d) By using the DROP VIEW statement

# Lec 41 - Updating Multiple Tables

- 1. Which SQL statement is used to update data in multiple tables at once?
  - A) UPDATE
  - B) ALTER
  - C) JOIN
  - D) SELECT

Answer: C) JOIN

# Which type of join is used to update data in multiple tables based on a matching column?

- A) INNER JOIN
- B) OUTER JOIN
- C) LEFT JOIN
- D) RIGHT JOIN

Answer: A) INNER JOIN

# What happens when you attempt to update data in multiple tables without using a join statement?

- A) The update fails
- B) Data in one table is updated but not the other
- C) Data in both tables is updated but the result may be inconsistent
- D) Data in both tables remains unchanged

Answer: C) Data in both tables is updated but the result may be inconsistent

# Which keyword is used to specify the table to be updated in an SQL query?

- A) SET
- B) FROM
- C) WHERE
- D) UPDATE

Answer: D) UPDATE

# When updating data in multiple tables, which of the following is NOT a recommended practice?

- A) Back up the database before making any changes
- B) Test the update on a small sample of data first
- C) Use a transaction to ensure all changes are made together
- D) Update tables in a random order

Answer: D) Update tables in a random order

# Which type of subquery can be used to update data in a table based on values in another table?

- A) Correlated subquery
- B) Non-correlated subquery
- C) Nested subquery
- D) None of the above

Answer: A) Correlated subquery

### In which scenario would you use a LEFT JOIN to update data in multiple tables?

A) When you want to update data only in the first table

- B) When you want to update data only in the second table
- C) When you want to update data in both tables
- D) When you want to update data in the first table and keep all the rows in the second table

Answer: D) When you want to update data in the first table and keep all the rows in the second table

### What is the purpose of a foreign key constraint in a database?

- A) To ensure that data in one table matches data in another table
- B) To prevent data duplication in a table
- C) To improve query performance
- D) To encrypt sensitive data

Answer: A) To ensure that data in one table matches data in another table

### Which type of join returns all rows from both tables, even if there is no match?

- A) INNER JOIN
- B) OUTER JOIN
- C) LEFT JOIN
- D) RIGHT JOIN

**Answer: B) OUTER JOIN** 

# Which SQL statement can be used to roll back changes made during an update operation?

- A) ROLLBACK
- B) COMMIT
- C) SAVEPOINT
- D) UPDATE

Answer: A) ROLLBACK

# Lec 42 - The Concept of a Transaction

### 1. What does the concept of a transaction refer to in databases?

- A) A single database operation
- B) A sequence of operations executed as a single unit of work
- C) A table modification
- D) A data query

Answer: B

# Why is the concept of a transaction important in databases?

- A) It allows for faster data access
- B) It ensures data consistency and integrity
- C) It reduces database storage requirements
- D) It eliminates the need for data backups

**Answer: B** 

# Which of the following is an ACID property that a transaction must follow?

- A) Atomicity
- B) Security
- C) Availability
- D) Performance

Answer: A

## What does atomicity mean in the context of transactions?

- A) The transaction must complete successfully or be rolled back completely
- B) The transaction must be isolated from other transactions
- C) The transaction must leave the database in a consistent state
- D) The transaction must be durable

Answer: A

# Which ACID property ensures that a transaction leaves the database in a consistent state?

- A) Atomicity
- B) Consistency
- C) Isolation
- D) Durability

Answer: B

### What does isolation mean in the context of transactions?

- A) The transaction must complete successfully or be rolled back completely
- B) The transaction must be isolated from other transactions
- C) The transaction must leave the database in a consistent state
- D) The transaction must be durable

Answer: B

### Which ACID property ensures that a transaction is isolated from other transactions?

- A) Atomicity
- B) Consistency
- C) Isolation
- D) Durability

Answer: C

# What does durability mean in the context of transactions?

A) The transaction must complete successfully or be rolled back completely

- B) The transaction must be isolated from other transactions
- C) The transaction must leave the database in a consistent state
- D) The transaction must be durable

Answer: D

# Which ACID property ensures that a transaction is durable even in the event of system failures?

- A) Atomicity
- B) Consistency
- C) Isolation
- D) Durability

Answer: D

## Which of the following is a benefit of using transactions in databases?

- A) Faster data access
- B) Reduced storage requirements
- C) Improved data consistency and integrity
- D) Elimination of the need for data backups

**Answer: C** 

# Lec 43 - Incremental Log with Deferred Updates

# 1. What is the primary goal of Incremental Log with Deferred Updates in a database management system?

- a) To improve data consistency
- b) To improve data security
- c) To improve efficiency and performance
- d) To improve user experience

Answer: c) To improve efficiency and performance

# What is the purpose of a log file in Incremental Log with Deferred Updates?

- a) To store all database records
- b) To record changes to the database as they occur
- c) To store metadata about the database
- d) To store backup copies of the database

Answer: b) To record changes to the database as they occur

## In Incremental Log with Deferred Updates, when are changes applied to the database?

- a) As soon as they are made
- b) At the end of each transaction
- c) At a later time, after being recorded in the log file
- d) None of the above

Answer: c) At a later time, after being recorded in the log file

### Which of the following benefits does Incremental Log with Deferred Updates offer?

- a) Improved data security
- b) Improved data consistency
- c) Improved efficiency and performance
- d) Improved ease of use

Answer: c) Improved efficiency and performance

### Which of the following statements is true about Incremental Log with Deferred Updates?

- a) It is a technique used only in small databases
- b) It is a technique that must be used with all databases
- c) It is a technique that can improve the performance of large databases
- d) It is a technique that can only be used with certain types of databases

Answer: c) It is a technique that can improve the performance of large databases

## What is the primary disadvantage of Incremental Log with Deferred Updates?

- a) It can lead to inconsistencies in the database
- b) It can increase the risk of data loss
- c) It can make it more difficult to manage the database
- d) It can be slower than other techniques

Answer: a) It can lead to inconsistencies in the database

# Which of the following is an example of a situation where Incremental Log with Deferred Updates may not be appropriate?

- a) A financial institution that processes thousands of transactions per second
- b) A small business that processes a few transactions per day
- c) A healthcare organization that stores patient records

d) None of the above

Answer: b) A small business that processes a few transactions per day

# Which of the following is a benefit of using a log file in Incremental Log with Deferred Updates?

- a) It allows for faster data entry
- b) It provides a backup of the database
- c) It can help to recover from system failures
- d) It reduces the need for database indexing

Answer: c) It can help to recover from system failures

### What is the role of the transaction manager in Incremental Log with Deferred Updates?

- a) To manage the log file
- b) To ensure data consistency
- c) To apply changes to the database
- d) To ensure data security

Answer: b) To ensure data consistency

# Which of the following best describes how Incremental Log with Deferred Updates improves performance?

- a) By reducing the amount of data that needs to be stored in memory
- b) By reducing the time it takes to apply changes to the database
- c) By reducing the amount of data that needs to be indexed
- d) By reducing the number of transactions that can be processed simultaneously

Answer: b) By reducing the time it takes to apply changes to the database

# Lec 44 - Uncommitted Update Problem

### 1. What is the Uncommitted Update Problem?

- a) When a transaction updates a record, but the update is not yet committed
- b) When a transaction deletes a record, but the deletion is not yet committed
- c) When a transaction reads a record, but the record is not yet committed

Answer: a

## What are the consequences of the Uncommitted Update Problem?

- a) Dirty reads
- b) Non-repeatable reads
- c) Phantom reads
- d) All of the above

Answer: d

# Which concurrency control mechanisms are used to prevent the Uncommitted Update Problem?

- a) Locking
- b) Timestamps
- c) Both locking and timestamps
- d) None of the above

Answer: c

## Which type of read anomaly can occur due to the Uncommitted Update Problem?

- a) Dirty read
- b) Non-repeatable read
- c) Phantom read
- d) All of the above

Answer: a

# Which of the following is not a consequence of the Uncommitted Update Problem?

- a) Deadlock
- b) Dirty read
- c) Non-repeatable read
- d) Phantom read

Answer: a

# Which of the following is a way to prevent the Uncommitted Update Problem?

- a) Increasing the transaction isolation level
- b) Decreasing the transaction isolation level
- c) Not using any concurrency control mechanism
- d) None of the above

Answer: a

### Which of the following is an example of the Uncommitted Update Problem?

- a) A transaction updates a record, but the update is not yet committed
- b) A transaction reads a record, but the record is not yet committed
- c) A transaction deletes a record, but the deletion is not yet committed

Answer: a

### Which of the following describes a dirty read?

a) When a transaction reads a record that has been updated but not yet committed

- b) When a transaction reads a record that has been deleted but not yet committed
- c) When a transaction reads a record that has been inserted but not yet committed Answer: a

### Which of the following describes a non-repeatable read?

- a) When a transaction reads a record that has been updated but not yet committed
- b) When a transaction reads a record that has been deleted but not yet committed
- c) When a transaction reads the same record multiple times and gets different results

Answer: c

# Which of the following is a potential consequence of using a low transaction isolation level?

- a) Reduced risk of the Uncommitted Update Problem
- b) Increased risk of the Uncommitted Update Problem
- c) No effect on the risk of the Uncommitted Update Problem

Answer: b

# Lec 45 - Locking Idea

### 1. What is locking in a database management system?

- a. A mechanism to prevent transactions from accessing shared resources
- b. A mechanism to prevent transactions from accessing only exclusive resources
- c. A mechanism to allow transactions to access shared resources simultaneously
- d. A mechanism to allow transactions to access exclusive resources simultaneously

#### Answer: a

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

- a. Shared lock
- b. Exclusive lock
- c. Read lock
- d. Write lock

#### Answer: c

### What is the purpose of a shared lock?

- a. To allow multiple transactions to read the same resource simultaneously
- b. To prevent multiple transactions from reading the same resource simultaneously
- c. To allow multiple transactions to write to the same resource simultaneously
- d. To prevent multiple transactions from writing to the same resource simultaneously

### Answer: a

## What is the purpose of an exclusive lock?

- a. To allow multiple transactions to read the same resource simultaneously
- b. To prevent multiple transactions from reading the same resource simultaneously
- c. To allow multiple transactions to write to the same resource simultaneously
- d. To prevent multiple transactions from writing to the same resource simultaneously

### Answer: d

### What is a deadlock?

- a. A situation where two or more transactions are waiting for each other to release locks
- b. A situation where a transaction is waiting for a lock that is held by another transaction
- c. A situation where a transaction is waiting for a lock that has already been released
- d. A situation where a transaction is waiting for a resource that is not available

#### Answer: a

### What is a timeout in locking?

- a. A mechanism to release a lock after a specified time period
- b. A mechanism to acquire a lock after a specified time period
- c. A mechanism to prevent a transaction from acquiring a lock
- d. A mechanism to prevent a transaction from releasing a lock

### Answer: a

### What is the purpose of lock escalation?

- a. To reduce the number of locks held by a transaction
- b. To increase the number of locks held by a transaction
- c. To release all locks held by a transaction
- d. To prevent a transaction from acquiring any locks

### Answer: a

### What is the difference between a shared lock and an exclusive lock?

a. A shared lock allows multiple transactions to read the same resource, while an exclusive lock

prevents multiple transactions from writing to the same resource simultaneously

- b. A shared lock allows multiple transactions to write to the same resource simultaneously, while an exclusive lock prevents multiple transactions from reading the same resource simultaneously
- c. A shared lock allows multiple transactions to access the same resource simultaneously, while an exclusive lock prevents any other transactions from accessing the resource until the lock is released
- d. A shared lock allows a transaction to access a resource exclusively, while an exclusive lock allows multiple transactions to access the same resource simultaneously

### Answer: c

### What is the purpose of lock granularity?

- a. To determine the size of the resource that will be locked
- b. To determine the type of lock that will be used
- c. To determine the duration of the lock
- d. To determine the transaction that will hold the lock

### Answer: a

# What is the purpose of a lock manager in a database management system?

- a. To manage the acquisition and release of locks
- b. To manage the execution of transactions
- c. To manage the storage of data
- d. To manage the retrieval of data

### Answer: a