



CSc 484

Database Management Systems

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Exam #1 – Review

Review for Exam #1

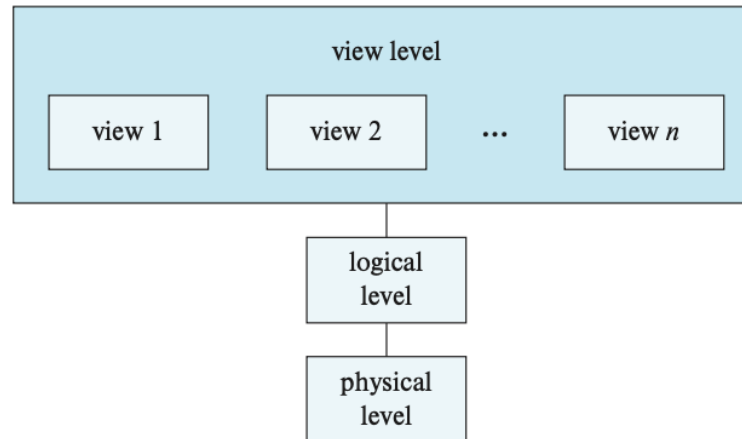
- The exam will include:
 1. Write SQL queries based on a given database
 2. Short answers

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- DBMS
 - A software system that enables users to define, create, maintain, and control access to the database
 - MS SQL Server, MySQL, Oracle, PostgreSQL, ...
- Database
 - A shared collection of logically related data and its description, designed to meet the information needs of an organization.
 - A single, possibly large repository of data that can be used simultaneously by many departments and users

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- Database system architecture
 - Hide low-level implementation details from high-level users
 - Logical level: describe what data are stored in the database, and what relationship exist among those data
 - Physical level: describe how the data are actually stored



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- Data model:
 - A collection of conceptual tools for describing:
 - Data
 - Data relationships
 - Data semantics
 - Data constraints
- Relational model
 - Use a collection of tables to represent both the data and the relationships among those data

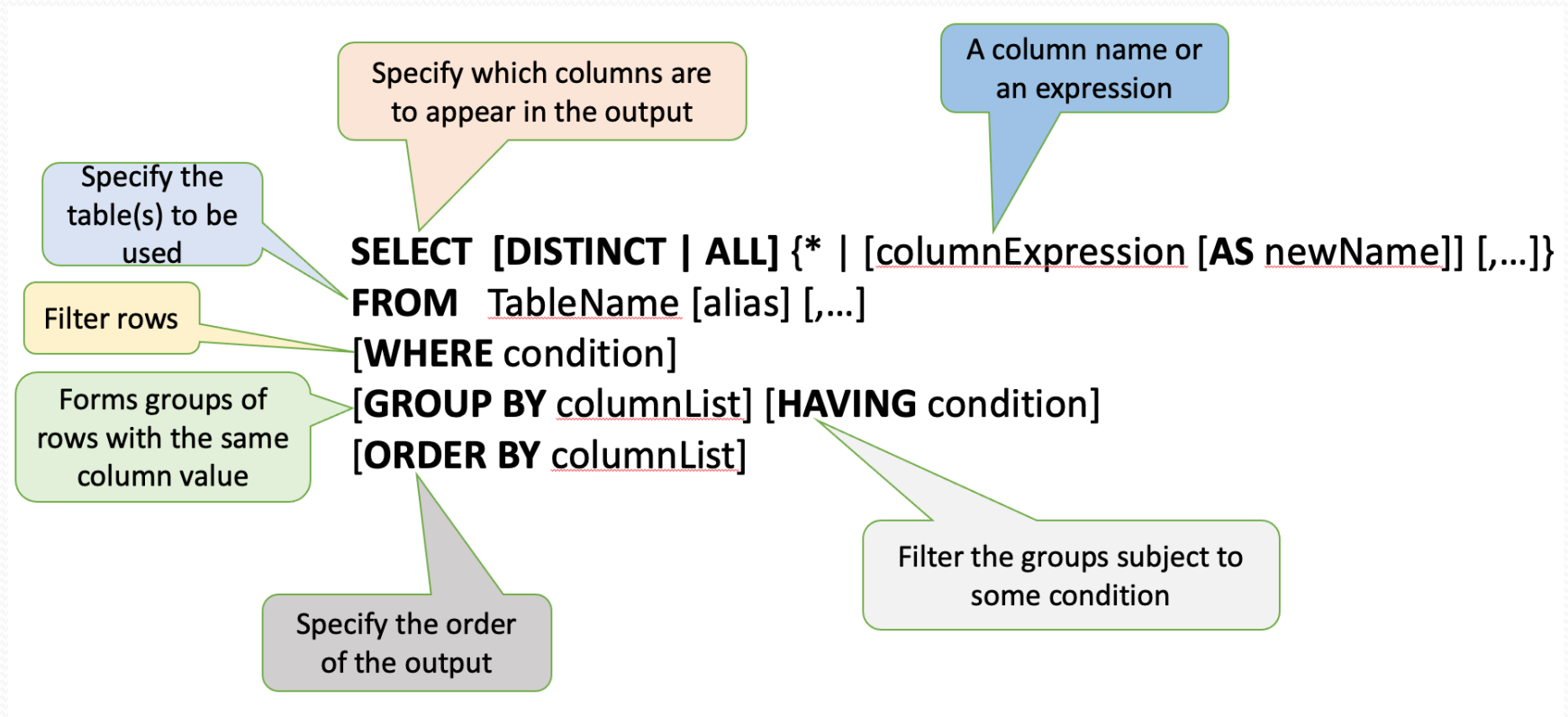
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- Database language
 - Data-definition language (DDL)
 - To specify the database schema
 - Data-manipulation language (DML)
 - To express database queries and updates.
 - SQL language
 - DDL and DML
 - Most widely used
 - Supported by almost all relational database system

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- Primary keys
- Foreign keys

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- WHERE clause:
 - Five basic search conditions
 - Comparison
 - Range
 - Set membership
 - Pattern match
 - Null
- Order of operations
 - FROM, WHERE, GROUP BY, HAVING, SELECT, ORDER BY

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- Aggregate functions:
 - Take a collection (a single column of a table) of values as input and return a single value
- Can be only used in SELECT clause and HAVING clause
 - AVG (average)
 - SUM (total)
 - MIN (minimum)
 - MAX (maximum)
 - COUNT (count)

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- Subquery: a mechanism to embed a Select statement within another Select statement
 - The inner select (or subselect) are used in the outer statement to help determine the contents of the result relation
- Usage:
 - Set membership
 - Set comparison
 - ANY / ALL

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- JOIN
 - Combine information from two tables by forming pairs of related rows from the two tables
 - Combine a selection and a Cartesian product into one single operation
- FROM .. WHERE
- JOIN .. ON

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- OUTER JOIN
 - LEFT OUTER JOIN
 - RIGHT OUTER JOIN
 - FULL OUTER JOIN

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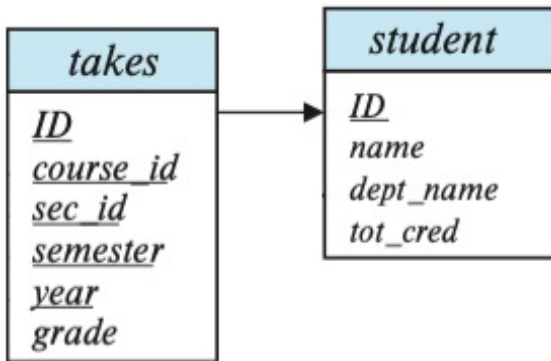
- Set operations
 - UNION
 - INTERSET
 - EXCEPT
- Modification of the database
 - Deletion
 - Insertion
 - Updates

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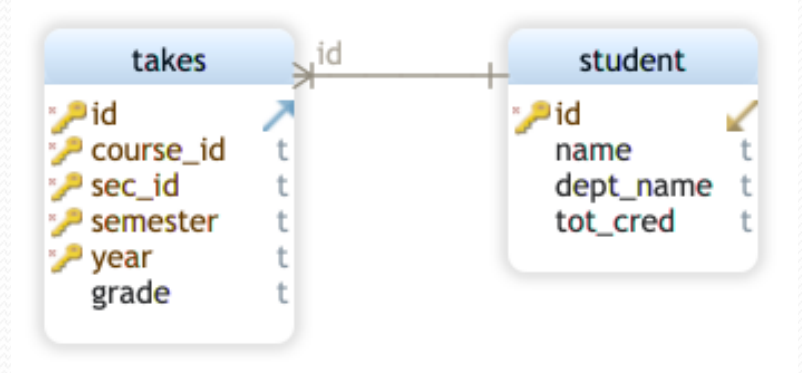
- CREATE TABLE
 - Integrity constraints
- DROP TABLE
- ALTER TABLE

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Textbook format



DbSchema format



Acknowledgments

- DbSchema
 - <https://dbschema.com/editions.html>