DBMS (DataBase Management System)

October 4, 2019

Learn DBMS

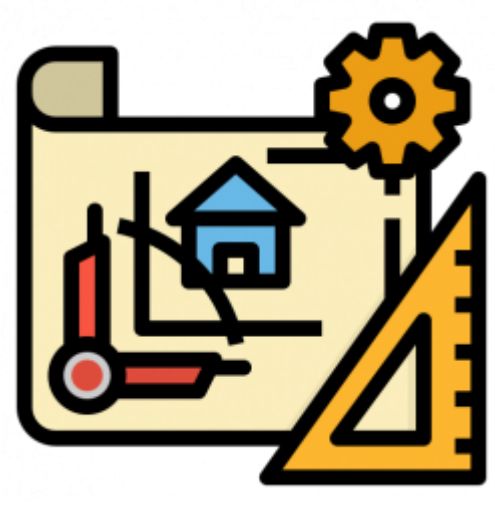
DBMS again is very important subject of computer science courses and is well asked in various placement exams both in the online tests as MCQ's and also in Interviews for various companies. Most Data Science companies have DBMS as requirement for you to learn.

Introduction

- What is Data
- What is Database
- What is Database Management System
- File Systems vs DBMS (Why we shifted to DBMS)
- Tuple
- Record

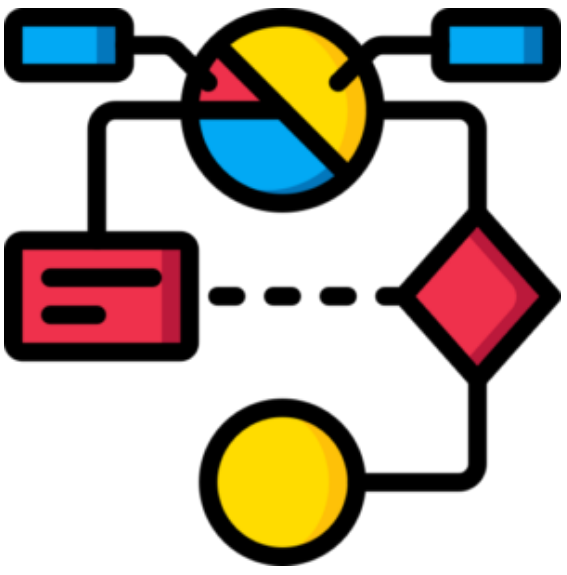
Architecture and Models

- DBMS Architecture
  - 2 Level
  - 3 Level
- Need For DBMS
- Data Abstraction and Data Independence
- DBMS Database Models
- Data Models
  - Hierarchical Model



- Network Model

- Entity-relationship Model
- Relational Model
- Object-Oriented Relation DBMS



ER Models

- **ER Data Model Basics concepts. (Attributes, relationships, Entities)**
- Entity-Relationship Model **Advanced**
  - Attribute
  - Key Attribute
  - Composite Attribute
  - Multivalued Attribute
  - Derived Attribute
- Cardinality
  - Cardinality Ratio
  - One to One
  - One to Many
  - Many to One
  - Many to Many
- Relationships
  - Types of Relationship
  - Unary Relationship
  - Binary Relationship
  - n – ary Relationship
  - Recursive Relationship
  - Ternary Relationship
- Relationship – Cardinality
- Participation Constraint
- Weak Entity and Strong Entity
- Generalization Specialization and Aggregation
  - Generalization
  - Specialization
  - Aggregation

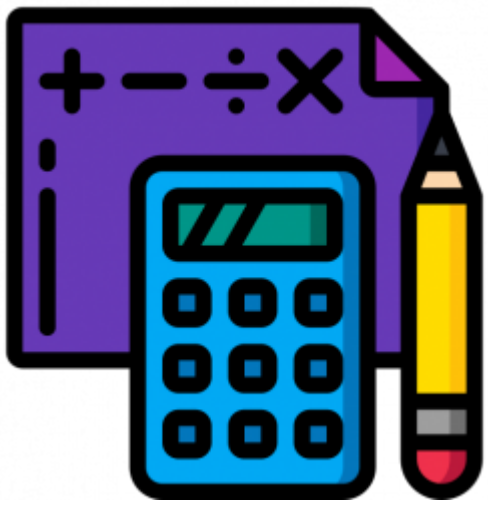
Relational Database Model

- Codd's Rule
- RDBMS
- Relational Data Model
- Keys in the Relational Model
- Keys in DBMS
  - Primary Key in DBMS **| Oracle | SQL**
  - Foreign Key in DBMS **| Oracle | SQL**
  - Candidate Key in DBMS **| Oracle | SQL**
  - Super Key in DBMS **| Oracle | SQL**
  - Alternate Key in DBMS **| Oracle | SQL**
  - Composite Key in DBMS **| Oracle | SQL**
  - Non-Prime Attribute
- **SQL Constraints**
  - Default in DBMS **| Oracle | SQL**
  - Not Null in DBMS **| Oracle | SQL**
  - Unique in DBMS **| Oracle | SQL**
  - Check-in DBMS **| Oracle | SQL**
  - Key Constraints in DBMS **| Oracle | SQL**
  - Domain constraints in DBMS **| Oracle | SQL**
  - Mapping constraints
- ER to Relational Model Conversion

Relational Calculus

To learn better you have to start somewhere so following are the basics of DBMS that will help you clear your concepts about what DBMS comprises of.

- Relational Calculus
- Tuple Relational Calculus **(TRC)**
- Domain Relational Calculus **(DRC)**



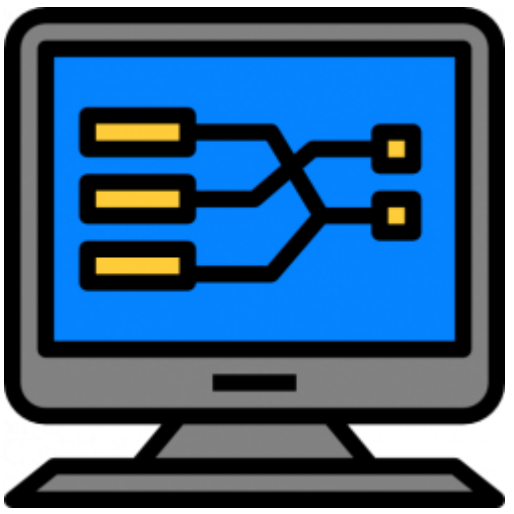
Relational Algebra

This topic is of prime importance in DBMS since it is a little tricky to grasp. These questions are often found in the semester exams and technical rounds of various companies.

- Relational Algebra
- Basic Operators
- Extended Operators

Functional Dependencies

To learn better you have to start somewhere so following are the basics of DBMS that will help you clear your concepts about what DBMS comprises of.



- Functional Dependencies
- Attribute Closure
- Equivalence of Functional Dependencies
- Canonical Cover

Normalisation

- Introduction Normalisation
- Normal Forms
  - 1NF Form
  - 2NF Form
  - 3NF Form
  - Boyce-Codd Normal Form
  - 4NF
  - 5NF
- Joins in DBMS | SQL
  - Inner Joins in DBMS | SQL
  - Outer Join in DBMS | SQL
  - Left Join in DBMS | SQL
  - Right Join in DBMS | SQL

- Dependency Preserving Decomposition

- Lossless Join Decomposition
- Lossless Join and Dependency Preserving Decomposition

Transaction Control and B Trees

- **Transactions and Concurrency Control :**
  - Deadlock in DBMS
  - ACID Properties **in DBMS | Oracle | SQL**
  - Concurrency Control Protocols – Lock-Based Protocol
  - Conflict Serializability
  - View Serializability
  - Recoverability of Schedules
- **Indexing, B and B+ trees :**
  - Indexing and its Types
  - B-Tree Introduction
  - B-Tree Insert
  - B-Tree Delete

- DBMS -HASHING

SQL

To learn better you have to start somewhere so following are the basics of DBMS that will help you clear your concepts about what DBMS comprises of.

- Predicate in DBMS **| Oracle | Pl/SQL**
- SQL -Operators in DBMS **| Oracle | Pl/SQL**
- SQL- Expressions in DBMS **| Oracle | Pl/SQL**
- CREATE Table in DBMS **| Oracle | Pl/SQL**
- ALTER table in DBMS **| Oracle | Pl/SQL**
- DROP/TRUNCATE/RENAME table in DBMS **| Oracle | Pl/SQL**
- Tuple/Record in DBMS **| Oracle | Pl/SQL**

Queries

To learn better you have to start somewhere so following are the basics of DBMS that will help you clear your concepts about what DBMS comprises of.

- SELECT in DBMS | **Oracle | SQL**
- INSERT in DBMS | **Oracle | SQL**
- WHERE in DBMS | **Oracle | SQL**
- AND & OR in DBMS | **Oracle | SQL**
- UPDATE in DBMS | **Oracle | SQL**
- DELETE in DBMS | **Oracle | SQL**
- LIKE in DBMS | **Oracle | SQL**
- ORDER BY in DBMS | **Oracle | SQL**
- GROUP BY in DBMS | **Oracle | SQL**
- DISTINCT in DBMS | **Oracle | SQL**
- ROW in DBMS | **Oracle | SQL**
- TRUNCATE in DBMS | **Oracle | SQL**
- RENAME in DBMS | **Oracle | SQL**
- DROP in DBMS | **Oracle | SQL**

SQL Set Operations and Advanced SQL

To learn better you have to start somewhere so following are the basics of DBMS that will help you clear your concepts about what DBMS comprises of.

- SQL SET OPERATIONS IN DBMS
  - UNION-UNION ALL
  - INTERSECT
  - MINUS
- **ADVANCED SQL**
  - NULL in DBMS | **Oracle | SQL**
  - USING VIEWS in DBMS | **Oracle | SQL**
  - INJECTION in DBMS | **Oracle | SQL**
  - **HANDLING DUPLICATES in DBMS | Oracle | SQL**

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