Basic SQL

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March 18, 2019

This contains the basic in SQL/Databases one should be familiar with for Software Developer/Data Analyst/Data Scientist role.

1. Need for Databases
2. DBMS/RDBMS
3. SQL
4. Types of Commands
   (a) DDL
   (b) DML
5. Databases
6. Tables
   (a) Rows
   (b) Columns
   (c) System Generated Tables
   (d) User Defined Tables
7. **Constraints**
   (a) Unique
   (b) Check
   (c) Not NULL
   (d) Primary Key
   (e) Foreign Key
   (f) Default
8. AUTO-INCREMENT/IDENTITY
9. Cardinality in Databases
10. **Queries**
    (a) CREATE
    (b) SELECT (SELECT INTO)
    (c) UPDATE
    (d) DELETE
11. Joins and Types
    (a) Inner Join
    (b) Outer Join

        i. Left Outer
        ii. Right Outer
        iii. Full Outer
    (c) Self Join
    (d) Cross Join
12. Handling NULL values
    (a) CASE Statement
    (b) COALESCE
    (c) ISNULL() or NVL()
13. GROUP BY & HAVING
14. Aggregate Functions
    (a) COUNT
    (b) SUM
    (c) MAX
    (d) MIN
    (e) AVG
15. CASE Statement
16. UNION ALL (Contains Duplicates)
17. UNION (Slower)
18. Joins vs UNION
19. **Normalization** (Normal Forms)
    (a) 1NF (No comma separated values in a single column and no repeating columns and contains PK)
    (b) 2NF (1NF + no redundant data and connect tables with a FK)
    (c) 3NF (1NF + 2NF + remove columns not fully dependant on PK)
    (d) 4NF
    (e) 5NF
    (f) BCNF
20. Indexes and Types
    (a) Clustered (Page Numbers)
    (b) Non-Clustered (Table of Contents)
    (c) Unique
21. Cursor
22. Views and Types
23. Triggers and Types
24. Stored Procedure (SP)
    (a) System Generated
    (b) User Defined
25. Temporary Tables

   (a) Local Temporary
   (b) Global Temporary

26. Derived Table
27. Common Table Expression (CTE)
    - Normal CTE
    - Recursive CTE
28. Sub-Queries
    (a) Normal
    (b) Correlated
29. String Functions (UPPER, LOWER)
30. Datetime Functions
31. MERGE
32. INTERSECT
33. MINUS
34. LOCKS
35. EXCEPT
36. Blocking Queries
37. ROLLUP, CUBE. GROUPING SETS
38. OVER
39. PARTITION BY
40. ROW_NUMBER
41. RANK
42. DENSE_RANK
43. LEAD and LAG (SQL Server)
44. OLTP vs OLAP
45. Transactional Databases
46. Data Warehouse `https://aws.amazon.com/data-warehouse/`
47. **Schemas in DW**
    - STAR Schema
    - Snowflake Schema