Basic SQL

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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. LIMIT

12. Joins and Types

    (a) Inner Join

    (b) Outer Join

        i. Left Outer

       ii. Right Outer

      iii. Full Outer

    (c) Self Join

    (d) Cross Join

13. Handling NULL values

    (a) CASE Statement

    (b) COALESCE

    (c) ISNULL() or NVL()

14. GROUP BY & HAVING

15. Aggregate Functions

    (a) COUNT

    (b) SUM

    (c) MAX

    (d) MIN

    (e) AVG

16. CASE Statement

17. UNION ALL (Contains Duplicates)

18. UNION (Slower)

19. Joins vs UNION

20. **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

21. Indexes and Types

    (a) Clustered (Page Numbers)

    (b) Non-Clustered (Table of Contents)

    (c) Unique

22. Cursor

23. Views and Types

24. Triggers and Types

25. Stored Procedure (SP)

    (a) System Generated

    (b) User Defined

26. Temporary Tables

    (a) Local Temporary
    (b) Global Temporary

27. Derived Table

28. Common Table Expression (CTE)

    - Normal CTE
    - Recursive CTE

29. Sub-Queries

    (a) Normal
    (b) Correlated

30. String Functions (UPPER, LOWER)

31. Datetime Functions

32. MERGE

33. INTERSECT

34. MINUS

35. LOCKS

36. EXCEPT

37. Blocking Queries

38. ROLLUP, CUBE. GROUPING SETS

39. **Window Functions**

    - OVER
    - PARTITION BY
    - ROW_NUMBER
    - RANK
    - DENSE_RANK
    - LEAD and LAG (SQL Server)

40. OLTP vs OLAP

41. Transactional Databases

42. Data Warehouse `https://aws.amazon.com/data-warehouse/`

43. **Schemas in DW**

    - STAR Schema
    - Snowflake Schema