

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. **Queries**
 - (a) CREATE
 - (b) SELECT (SELECT INTO)
 - (c) UPDATE
 - (d) DELETE
10. Joins and Types
 - (a) Inner Join
 - (b) Outer Join
 - i. Left Outer

- ii. Right Outer
 - iii. Full Outer
- (c) Self Join
- (d) Cross Join
- 11. Handling NULL values
 - (a) CASE Statement
 - (b) COALESCE
 - (c) ISNULL() or NVL()
- 12. GROUP BY & HAVING
- 13. Aggregate Functions
 - (a) COUNT
 - (b) SUM
 - (c) MAX
 - (d) MIN
 - (e) AVG
- 14. CASE Statement
- 15. UNION ALL (Contains Duplicates)
- 16. UNION (Slower)
- 17. Joins vs UNION
- 18. 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
- 19. Indexes and Types
 - (a) Clustered (Page Numbers)
 - (b) Non-Clustered (Table of Contents)
 - (c) Unique
- 20. Cursor
- 21. Views and Types
- 22. Triggers and Types
- 23. Stored Procedure (SP)
 - (a) System Generated
 - (b) User Defined
- 24. Temporary Tables
 - (a) Local Temporary

(b) Global Temporary

25. Derived Table

26. Common Table Expression (CTE)

27. Sub-Queries

(a) Normal

(b) Correlated

28. String Functions (UPPER, LOWER)

29. Datetime Functions

30. MERGE

31. INTERSECT

32. MINUS

33. LOCKS

34. EXCEPT

35. Blocking Queries

36. ROLLUP, CUBE, GROUPING SETS

37. OVER

38. PARTITION BY

39. ROW_NUMBER

40. RANK

41. DENSE_RANK

42. LEAD and LAG (SQL Server)

43. OLTP vs OLAP

44. Transactional Databases

45. Data Warehouse