

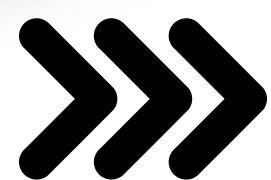


Tajamul Khan

SQL cheat sheet



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Data Definition

CREATE TABLE: Creates a new table.

```
CREATE TABLE table_name (id INT PRIMARY KEY,  
name VARCHAR(50));
```

ALTER TABLE: Modifies an existing table.

```
ALTER TABLE table_name ADD column2 INT;
```

DROP TABLE: Deletes a table.

```
DROP TABLE table_name;
```

CREATE INDEX: Creates an index on a table.

```
CREATE INDEX idx_name ON table_name (column1);
```

DROP INDEX: Removes an index.

```
DROP INDEX idx_name ON table_name;
```

CREATE VIEW: Creates virtual table based on query.

```
CREATE VIEW view_name AS SELECT column1,  
column2 FROM table_name;
```

DROP VIEW: Deletes a view.

```
DROP VIEW view_name;
```

RENAME TABLE: Renames an existing table.

```
RENAME TABLE old_table_nm TO new_table_name;
```



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Select Data

SELECT: Retrieves specific column from table.

SELECT column1, column2 FROM table_name;

DISTINCT: Removes duplicate rows from result.

SELECT DISTINCT column1 FROM table_name;

WHERE: Filters rows based on a condition.

SELECT * FROM table_name WHERE column1 = 'v1';

ORDER BY: Sorts result set by one or more columns.

SELECT * FROM table_nm ORDER BY column1 ASC;

LIMIT / FETCH: Limits the number of rows returned.

SELECT * FROM table_name LIMIT 10;

LIKE: Searches for patterns in text columns.

SELECT * FROM table_name WHERE col1 LIKE 'A%';

IN: Filters rows with specific values.

SELECT * FROM table_nm WHERE col1 IN ('v1', 'v2');

BETWEEN: Filters rows within a range of values.

SELECT * FROM table WHERE c1 BETWEEN 1 AND 20;



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Aggregate Data

COUNT(): Returns the number of rows.

```
SELECT COUNT(*) FROM table_name;
```

SUM(): Calculates the sum of a numeric column.

```
SELECT SUM(column1) FROM table_name;
```

AVG(): Calculates the average of a numeric column.

```
SELECT AVG(column1) FROM table_name;
```

MIN(): Returns the smallest value in a column.

```
SELECT MIN(column1) FROM table_name;
```

MAX(): Returns the largest value in a column.

```
SELECT MAX(column1) FROM table_name;
```

GROUP BY: Groups rows for aggregation.

```
SELECT col1, COUNT(*) FROM t1 GROUP BY col1;
```

HAVING: Filters grouped rows based on condition.

```
SELECT column1, COUNT(*) FROM t1 GROUP BY column1  
HAVING COUNT(*) > 5;
```

DISTINCT COUNT(): Counts unique values in column.

```
SELECT COUNT(DISTINCT col1) FROM table_name;
```



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Data Manipulation

INSERT INTO: Adds new rows to a table.

```
INSERT INTO table_name (column1, column2) VALUES  
('value1', 'value2');
```

UPDATE: Updates existing rows in a table.

```
UPDATE table_name SET col1 = 'value' WHERE id =  
1;
```

DELETE: Removes rows from a table.

```
DELETE FROM table_name WHERE column1 = 'value';
```

MERGE: Combines INSERT, UPDATE, and DELETE based on a condition.

```
MERGE INTO table_name USING source_table ON  
condition WHEN MATCHED THEN UPDATE SET column1 =  
value WHEN NOT MATCHED THEN INSERT (columns)  
VALUES (values);
```

TRUNCATE: Removes all rows from a table without logging.

```
TRUNCATE TABLE table_name;
```

REPLACE: Deletes existing rows and inserts new rows (MySQL-specific).

```
REPLACE INTO table_name VALUES (value1, value2);
```



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Transactions

Commit Transaction: Finalizes changes when all operations succeed.

```
START TRANSACTION;  
UPDATE accounts SET balance = 1000 WHERE id = 1;  
WHERE id = 2; COMMIT;
```

Execute a Stored Procedure: Undoes changes if an error occurs or the transaction is not committed.

```
START TRANSACTION;  
UPDATE accounts SET balance = 1000 WHERE id = 1;  
ROLLBACK;
```

Using Savepoints: Set a rollback point within a transaction, allowing partial rollback without affecting the whole transaction.

```
START TRANSACTION;  
UPDATE accounts SET balance = 1000 WHERE id = 1;  
SAVEPOINT sp1;  
UPDATE accounts SET balance = 2000 WHERE id = 3;  
-- Simulate failure  
ROLLBACK TO SAVEPOINT sp1;  
UPDATE accounts SET balance = 1000 WHERE id = 2;  
COMMIT;
```



Set Operations

UNION: Combines results from two queries, removing duplicates.

```
SELECT column1 FROM table1 UNION SELECT  
column1 FROM table2;
```

UNION ALL: Combines results from two queries, including duplicates.

```
SELECT column1 FROM table1 UNION ALLSELECT  
column1 FROM table2;
```

INTERSECT: Returns common rows from both queries.

```
SELECT column1 FROM table1 INTERSECT SELECT  
column1 FROM table2;
```

EXCEPT (or MINUS): Returns rows from the first query that are not in the second query.

```
SELECT column1 FROM table1 EXCEPTSELECT  
column1 FROM table2;
```



Table Joins

INNER JOIN: matching values in both tables.

```
SELECT * FROM table1 INNER JOIN table2 ON  
table1.id = table2.id;
```

LEFT JOIN: Returns all rows from the left table and matching rows from the right table.

```
SELECT * FROM table1 LEFT JOIN table2 ON  
table1.id = table2.id;
```

RIGHT JOIN: Returns all rows from the right table and matching rows from the left table.

```
SELECT * FROM table1 RIGHT JOIN table2 ON  
table1.id = table2.id;
```

FULL OUTER JOIN: Returns rows when there is a match in either table.

```
SELECT * FROM table1 FULL OUTER JOIN table2  
ON table1.id = table2.id;
```

CROSS JOIN: Cartesian product of both tables.

```
SELECT * FROM table1 CROSS JOIN table2;
```

SELF JOIN: Joins a table with itself.

```
SELECT a.column1, b.column1 FROM table_name  
a, table_name b WHERE a.id = b.parent_id;
```



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Other Functions

CONCAT(): Concatenates strings.

```
SELECT CONCAT(first_name, ' ', last_name) FROM  
table_name;
```

SUBSTRING(): Extracts a substring from a string.

```
SELECT SUBSTRING(column1, 1, 5) FROM table_nm;
```

LENGTH(): Returns the length of a string.

```
SELECT LENGTH(column1) FROM table_name;
```

ROUND(): Rounds a number to a specified number of decimal places.

```
SELECT ROUND(column1, 2) FROM table_name;
```

NOW(): Returns the current timestamp.

```
SELECT NOW();
```

DATE_ADD(): Adds a time interval to a date.

```
SELECT DATE_ADD(NOW(), INTERVAL 7 DAY);
```

COALESCE(): Returns the first non-null value.

```
SELECT COALESCE(column1, column2) FROM  
table_name;
```

IFNULL(): Replaces NULL values with desired value.

```
SELECT IFNULL(col1, 'default') FROM table_name;
```



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Window Functions

ROW_NUMBER: Assigns a unique number to each row in a result set.

```
SELECT ROW_NUMBER() OVER (PARTITION BY department ORDER BY salary DESC) AS row_num FROM employees;
```

RANK: Assigns a rank to each row, with gaps for ties.

```
SELECT RANK() OVER (PARTITION BY department ORDER BY salary DESC) AS rank FROM employees;
```

DENSE_RANK: Assigns a rank to each row without gaps for ties.

```
SELECT DENSE_RANK() OVER (PARTITION BY department ORDER BY salary DESC) AS dense_rank FROM employees;
```

NTILE: Divides rows into equal parts.

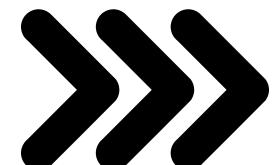
```
SELECT NTILE(4) OVER (ORDER BY salary) AS quartile FROM employees;
```

LEAD(): Accesses subsequent rows' data.

```
SELECT name, salary, LEAD(salary) OVER (ORDER BY salary) AS next_salary FROM employees;
```

LAG(): Accesses previous rows' data.

```
SELECT name, salary, LAG(salary) OVER (ORDER BY salary) AS previous_salary FROM employees;
```



Stored Procedures

Create a Stored Procedure:

```
CREATE PROCEDURE sp_GetEmployeeByID  
@EmployeeID INT  
AS  
BEGIN  
-- SQL statements inside the stored  
procedure  
SELECT * FROM Employees  
WHERE EmployeeID = @EmployeeID;
```

Execute a Stored Procedure:

```
EXEC sp_GetEmployeeByID @EmployeeID = 1;
```

Stored Procedure with OUT Parameter:

```
CREATE PROCEDURE GetEmployeeCount (OUT  
emp_count INT)  
BEGIN  
SELECT COUNT(*) INTO emp_count FROM  
employees; END;
```

Drop a Stored Procedure:

```
DROP PROCEDURE GetEmployeeDetails;
```



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Triggers

Create a Trigger (Before Insert):

```
CREATE TRIGGER set_created_at  
BEFORE INSERT ON employees  
FOR EACH ROW  
SET NEW.created_at = NOW();
```

After Update Trigger:

```
CREATE TRIGGER log_updates  
AFTER UPDATE ON employees  
FOR EACH ROW  
INSERT INTO audit_log(emp_id, old_salary,  
new_salary, updated_at)  
VALUES (OLD.id, OLD.salary, NEW.salary,  
NOW()));
```

After Delete Trigger:

```
CREATE TRIGGER log_deletes  
AFTER DELETE ON employees  
FOR EACH ROW  
INSERT INTO audit_log(emp_id, old_salary,  
new_salary, deleted_at)  
VALUES (OLD.id, OLD.salary, NULL, NOW());
```



Subquery

Scalar Subquery:

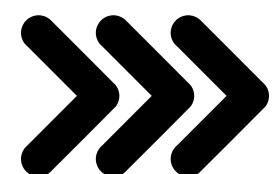
```
SELECT name, salary  
FROM employees  
WHERE salary > (SELECT AVG(salary)  
FROM employees);
```

Correlated Subquery:

```
SELECT e1.name, e1.salary  
FROM employees e1  
WHERE e1.salary > (SELECT  
AVG(e2.salary) FROM employees e2  
WHERE e1.department = e2.department);
```



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CTE

With a Single CTE:

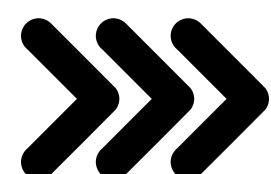
```
WITH DepartmentSalary AS (
    SELECT department, AVG(salary) AS avg_salary
    FROM employees
    GROUP BY department
)
SELECT *
FROM DepartmentSalary
WHERE avg_salary > 50000;
```

Recursive CTE:

```
WITH RECURSIVE Numbers AS (
    SELECT 1 AS num
    UNION ALL
    SELECT num + 1
    FROM Numbers
    WHERE num < 10)
SELECT * FROM Numbers;
```



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Indexes

Create an Index:

```
CREATE INDEX idx_department ON  
employees(department);
```

Unique Index: `CREATE UNIQUE INDEX idx_unique_email ON employees(email);`

Drop an Index:

```
DROP INDEX idx_department;
```

Clustered Index (SQL Server):

```
CREATE CLUSTERED INDEX idx_salary ON  
employees(salary);
```

Using EXPLAIN to Optimize:

```
EXPLAIN SELECT * FROM employees WHERE  
salary > 50000;
```



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