Cheatography

SQL Cheat Sheet

by iddd via cheatography.com/197744/cs/41798/

Very basic introduction

Databases are organized collections of information or data. They can be non-relaitonal (MongoDB, Oracle NoSQL) or relational (MySQL, Microsoft SQL Server, Oracle Database).

Non-relational databases store data in a non-tabular form and tend do be more flexibnle than the traditional relational databases. They are often used when large quantities of complex and diverse data neds to be organized. There are 4 major types of NoSQL databases: document databases, key-value databases, wide-column stores, graph databases.

Relational databases is a structure databasethat contians tables related to each other through keys.

-Primary keys: unique identifiers therefore cannot have duplicates or null values.

-Foreign keys: column in a table that it's the primary key in another table.

This document will focus on relational DB.

Query is a request for data. Nearly all relational databases rely on a version of SQL to query data.

Types of queries:

- DDL (data definition language)
- DQL (data query language)
- DML (data manipulation language)
- DCL (data control language)
- TCL (transaction control language)

Relational Algebra symbols

⊥	null
∪	reunion
∩	intersection
*	cartesian product
Π	projection
σ	selection
⋈	junction

Relational Algebra symbols (cont)

⋉	semi-junction

∪ reunion --> all; ∩ intersection --> middle ones; Π projection --> cuts columns; σ selection --> filters lines; ⋈ junction --> joins tables

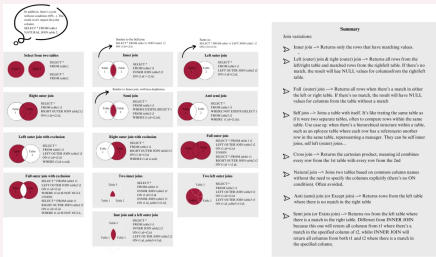
Eg:

Π_{BI}, sigla [$\sigma_{Quota>20 \wedge Sigla <> 'KB'}$ (Pratica)] --> The BI and Siglas of all the sports (table Prativa) that cost more than 20, except KB.

$\Pi_{Nome}[\sigma_{sigla = 'KB'}$ (Sócios ⋈ Pratica)] --> name of all the people who do KB.

https://docs.google.com/document/d/1_70GykfmTwcu9TJ6Ji5um-lx-g2A7_VT2/edit

DQL Joining tables



Tables are joined by a commun column (SELECT columns, FROM table1 INNER JOIN table 2 ON table1.column=table2.column)

For **reunion**: (SELECT columnname FROM tablename) UNION (SELECT columname FROM table2name)

For **intersection** (SELECT columname FROM tablename) INTERSECT (SELECT columname FROM table2name)

On access: - use NATURAL JOIN (for inner join);

Image source: https://www.reddit.com/r/SQL/comments/2zb1i0/sql_server_join_types_poster_version_2/

BD Example

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DDL

CREATE TABLE tablename (colum-nname type column-restriction, columnmae2 type columnrestriction, ...);	creates a table
CREATE INDEX name ON tablename-(column asc, column desc,...);	explicit creation of index (for efficiency for ex). Unique and primary keys will automa-tically create indexes!
DROP TABLE tablename	deletes tables if there are no references to thi table ou if these specify ON DELETE CASCADE. In this case, it deletes the table and all the reference lines on the other tables that refer to the deleted table
CREATE VIEW	creates a view that can be used as a table

Types:varchar2(n) = string of n characters variable size 1<4000, char(n) = string of n characters fixed size 1<255, number(p,s), date, timestamp...

Column restrictions: none, primary key, not null,unique, references, check. **Table restrictions**: primary key(col, col...), foreign key(col,c-ol..), check, references. All these depend on the db.

DML

Insertion	INSERT INTO tablename VALUES-(val, val, val...)	adds a line with all the values in the specified order
	INSERT INTO tablen-am(col,col...) VALUES(val,val...)	adds a line only with the values for the specificed columns
Modifi-cation	UPDTAE tablename SET col1=expr1, col2=exprs2 WHERE cond	all the lines that meet the cond have the col1 and col2 updated ccroding to the exr1 and expr2

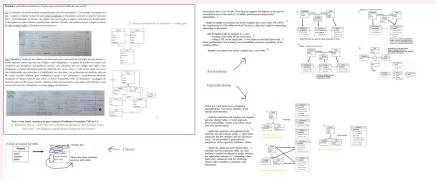
DML (cont)

Deletition	DELETE FROM tablename WHERE cond	deletes all the line in the table that meet the cond

The changes stay in a temporary state. To **commit** them permanently execut COMMIT. To **undo** the changes after the last commit do ROLLBACK.

It's possible to create **sequences** to automatically create values.Eg:create sequence num_socio start with 1000 increment by 10;insert into sócios values(num_socio.nextval, 'Quim');select num_socio.currval from dual; --> Crie uma sequência para gerar automaticamente números de sócios

UML to SQL



Operators, Patterns & Symbols

+	plus
-	minus
*	times
/	divided
||	concatenation
=	equal to
<>	different
!=	different
>	greater than
<	less than
>=	greater than or equal to
<=	less than or equal to
[not] in	belongs [doesn't belong]]
[not] between x and y	x <= value <= y [not]
x [not] like y	compares x to y
is [not] null	is[n't] null

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Operators, Patterns & Symbols (cont)

not	not
and	and
or	or
*	everything/all
_	any letter (only 1)
%	any sequence of characters
( )	fits queries inside other queries
distinct	eliminates duplicate rows

' ' - use for words

'M%' = Marina, M...

'M_r%' = Mar, Mari, Moreira...

'a__' = ant, add, alc....

On Microsoft Access use * (instead of %) and ? (instead of _)

Order of precedence:
1. Arithmetic operators (+ and - > * and / > ||)
2. Comparasion operators
3. Logic operators (not > and > or)

( ) --> SELEC by, salario FROM orienta WHERE salario = (SELECT max(salario) FROM orienta);

DQL Basics

SELECT rowname(s) FROM table name	displays all the info from the table on the row(s)
SELECT x FROM y WHERE anycriteria	displays all the x info, from table y, that meets the criteria
SELECT x FROM y WHERE criteria1 AND criteria2	diplays all the x info from table y, that meets the criteria 1 and 2
SELECT x, j FROM y ORDER BY j	displays all the x and j row's info, from y table, ordered by j
SELECT x, i FROM y GROUP BY x	displays the x and i info from table y, organized by x groups

DQL Basics (cont)

SELECT x, i FROM y GROUP BY x HAVING criteria	displays the x and i info from table y that fits the criteria, organized by the x.

ORDER BY applies to strings (alphabetically) and numbers (asc), and applies for more than one rows. Use **desc** to order backwards (SELECT x, j, i FROM y ORDER BY i, j desc).
GROUP BY organizes rows by a specific column.
Example: SELECT id, avg(classification) as grade FROM students GROUP BY id --> will calculate the average classification by id, taking that into account for the result on the grades column for ids that appear more than once.

DQL Simple calculations

SELECT avg(columnname) as newcolumnname FROM tablename	displays the average result of the numbers in the column of the table chosen in a new columns called newcolumnname
SELECT count	displays the number of rows on columname
SELECT sum	displays the addition of the numbers on the row
SELECT max	displays the higher number on the column
SELECT min	displays the smaller number

All of these can be used together (SELECT avg(x) as newname1, max(x) as newname2 FROM tablename;).

These are useful for as an example finding the average (avg) of a column, to count the total of rows of a column (count), the total of the values (sum) and the max and min numbers.

DQL - others

rownum	n. of the row for the resulting table
rowid	internal ddress for the row/line on the db
case --- when --- else --- end as	turns quantitative results into qualitative
nvl(valuex, valuelfNule)	returns 'valuex' if it's not null and valuelfNule if valuex is null

eg:SELECT rownum, rowid, column1, column3 FROM table; and "-SELECT columnname, column2name, CASE column3name WHEN n. THEN 'expression' WHEN othern. THEN 'otherexpression' ELSE 'anotherexpression' END AS newcolumnname FROM table; **Rownum** limits results to the first n lines for extensive outputs, while **rowid** allows quick access but is affected by import/export operations. **NVL** is also used as NVL(t, s, n), returning S if T is positive, otherwise N.

DCL

GRANT privilegetype (col1, col2) ON tablename TO username WITH grantoption

Types of privilege: alter, delete, execute, index, insert, read, references, select, update, create session, alter sesson, drop any table. Thrse apply to tables, viws, sequences, functions, packages, system and/or users.

Tehcnical support position

What type of queries are the most common on a technical support role? In this role, the most commonly used queries often involve retrieving and updating information related to users, tickets, issues, and system logs; data retrieval and correction; account management; configuration changes; audit trail analysis; performance tunign; report generation; data import/export issues. Egs:
1- Retrieve ticket information: SELECT * FROM tickets WHERE ticket_id = 'XYZ'
2- Updtate ticket status: UPDATE tickets SET status = 'closed' WHERE ticket_id = 'XYZ'

Tehcnical support position (cont)

3. Review system logs to identify patterns or isues affecting multiple users. SELECT * FROM system_logs WHERE log_type = 'Error' ORDER BY timestamp DESC LIMIT 10
4. Track user activity and interactions withthe system for troubleshooting purposes. SELECT * FROM user_activity WHERE user_id = 'ABC' ORDER BY timestamp DESC LIMIT 10
5. Update user information. UPDATE users SET email = 'new_email@example.com' WHERE user_id = 'ABC'
6. Check the status of a service. SELECT * FROM service_sttaus WHERE status = 'Down';
7. Retrieve FAQ information from a knowledge base or faq database to provide quick solutions to common issues. SELECT * FROM faq WHERE category ='Triubleshooting'.
8. User authentication issues: check if user's credentials are valid. SELECT * FROM users WHERE username ='user123' AND password= ' hashed_password'
9. Reset user passwords. UPDATE users SET password = 'new_hshed_password' WHERE username = 'user123'
10. Check system resource usage: monitor resource usage to identify potencial performance issues. SELECT * FROM system_resources WHERE resource_type = 'cpu' AND usage_percentage > 90;
11. Check recent system updates. SELECT * FROM system_updates ORDER BY update_date DESC LIMIT 10