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

\perp	null
U	reunion
Ω	intersection
*	cartesian product
П	projection
σ	selection
\bowtie	junction

Relational Algebra symbols (cont)

⋈ semi-junction

 \cup reunion --> all; \cap intersection --> middle ones; \square projection --> cuts columns; σ selection --> filters lines; \bowtie junction --> joins tables

Eg:

^{Π}BI, sigla [^{σ}Quota>20^Sigla <>'KB' (Pratica)] --> The BI and Siglas of all the sports (table Prativa) that cost more than 20, except KB. ^{Π}Nome[^{σ}sigla = 'KB' (Sócios \bowtie Pratica)] --> name of all the people who do KB.

https://docs.google.com/document/d/1_70GykfmTwcu9TJ6Ji5um-lxg2A7_VT2/edit



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

Exe	em	plo	do (Gin	ásio	D				
5	Sicks			Desportos				Pratica		
		Norse				30	- 6			
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35	955	Rita						4526	NT	20
91	876	Luis		Orte	-14			3955	KB .	30
99	999	Zé		11	5464	Salario		3955	NT	20
	locit	ores		123-	KB I	40		3955	AE.	25
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5	1676	Luís		9871	NT	30				
	1234	Inena		9871	5 AE	35				

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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 ablename	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,col..), 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	deletes all the line in the
	tablename WHERE	table that meet the cond
	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
1	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)			DQL Basics (cont)			
not no	ot		SELECT x, i FROM y displays the x and i info from tal			
and an	nd		GROUP BY x HAVING that fits the criteria, organized by criteria			
or or						
* ev	verything/all		ORDER BY applies to strings (alphabetically) and numbers (asc),			
_ an	ny letter (only	1)	and applies for more than one rows. Use desc to order backwards			
% an	ny sequence o	f characters	GROUP BY organizes ro	by a specific column.		
() fits	s queries insic	le other queries	Example: SELECT id, avg(classification) as grade FROM students			
distinct eli	iminates dupli	cate rows	GROUP BY id> will ca	GROUP BY id> will calculate the average classification by id,		
''- use for words			taking that into account for the result on the grades column for ids			
			that appear more than o	nce.		
'M%' = Marina, M			DQL Simple calculations	;		
'M_r%' = Mar, Mari, Moreira			SELECT avg(colum- nname) as newcol-	displays the average result of the numbers in the column of the table chosen in a new		
'a' = ant, add, alc			umnname FROMcolumns called newcolumnnametablename			
On Microsoft Access use * (instead of %) and ? (instead of _)			SELECT count	displays the number of rows on columname		
Order of precedence:			SELECT sum	displays the addition of the numbers on		
1. Arithmetic operators (+ and - > $*$ and / >)				the row		
2. Comparasion operators			SELECT max	displays the higher number on the column		
3. Logic operators (not > and > or)			SELECT min	displays the smaller number		
()> SELEC by, salario FROM orienta WHERE salario = (SELECT max(salario) FROM orienta);			All of these can be used together (SELECT avg(x) as newname1, max(x) as newname2 FROM tablename;).			
DQL Basics			These are useful for as a	an example finding the average (avg) of a		
SELECT rowname table name	e(s) FROM	displays all the info from the table on the row(s)	column, to count the total of rows of a column (count), the total of values (sum) and the max and min numbers.			
SELECT x FROM anycriteria	y WHERE	displays all the x info, from table y, that meets the criteria				
SELECT x FROM criteria1 AND crite	y WHERE eria2	diplays all the x info from table y, that meets the criteria 1 and 2				
SELECT x, j FROM ydisplays all the x and j row's info,ORDER BY jfrom y table, ordered by j						
SELECT x i EROM y displays the x and i info from table y						

GROUP BY x

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organized by x groups

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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, valuel-	returns 'valuex' if it's not null and valuel-
inule)	

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'

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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 with the 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

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