
SQL > Exercises

Preamble

Now let's try some more SQL select exercises on this data-set. Most exercises will be accompanied by their output in a hint — the results of a correct query, not the solution itself. Try to write your SQL code before glancing at the answer!

Writing Queries

It's helpful to write these queries in a new, separate file in your code editor. If you **set syntax to SQL** (which is automatic if you set the file extension to `.sql`) reading through your code will be easier. You can then copy-paste your SQL queries into the SQLite prompt. This is going to be sooooo much easier than writing into your console directly every time. Also, it serves as a persistent reference of previous efforts and will help you format the queries nicely and indent them to make them easier to read. Formatting and indentation will be very helpful when you get to the more complicated queries!

There Be Dragons Here

The exercises start simple but get more difficult further in. Some students are confronting SQL for the first time, whereas others may have significant experience in SQL. This workshop is intended to serve both needs, with fundamental skills tested early on, and some more complex and tricky queries by the end. Don't worry if you cannot finish!

Let's get started...

SQL > Exercises

Birthyear

Find all movies made in the year you were born.

Hint: Filtering rows

Click to toggle hint ▼

You will need to use a certain *clause*...

Hint: Conditions

Click to toggle hint ▼

The `WHERE` clause lets you filter rows by a condition.

◀ PREVIOUS LESSON
[Preamble](#)

NEXT LESSON ▶
[1982](#)

SQL > Exercises

1982

How many movies does our dataset have for the year 1982?

Hint: Aggregation

Click to toggle hint ▼

You will need to use a certain *expression* in your selection...

Hint: Remember this?

Click to toggle hint ▼

Selecting `COUNT (*)` will deliver a number rather than the rows!

< PREVIOUS LESSON
[Birthyear](#)

NEXT LESSON >
[Stacktors](#)

SQL > Exercises

Stacktors

Find actors who have "stack" in their last name.

Hint: Expected results

Click to toggle hint

id	first_name	last_name	gender
799089	Agnès	Stacke	F
450737	Arnold	Stackelber	M
450718	Bill	Stack	M
450719	Brian	Stack	M
450720	Chris	Stack	M
799091	Corinne	Stackpole	F
799092	Dana	Stackpole	F
450721	Dane	Stack	M
450742	David	Stackpole	M
799080	Elizabeth	Stack	F
799093	Ellie	Stackpole	F
799088	Else Karin	Stackbom	F
799081	Emma	Stack	F
201692	Giant	Haystacks	M
784978	Helen	Schustack	F
450740	Jeffrey	Stackhouse	M
450741	Jerry	Stackhouse	M
450722	Joe	Stack	M
799082	Jonna Leig	Stack	F
450723	Jordan	Stack	M
450724	Juan	Stack	M
450725	Kevin	Stack	M
450726	Liam	Stack	M
790107	Marciarose	Shestack	F
799083	Marcie	Stack	F
799094	Maryann	Stackpole	F
450743	Mike	Stackpole	M

450743	Mik	Stackpole	M
799084	Murphy	Stack	F
450728	Patrick	Stack	M
450738	Pete	Stacker	M
450739	Peter	Stacker	M
450744	Peter	Stackpole	M
799085	Pippa	Stack	F
450729	Robert	Stack	M
450736	Rolf	Stackbom	M
799087	Rosemarie	Stack	F
799086	Rose-Marie	Stack	F
450730	Sean	Stack	M
799090	Susan	Stackhouse	F
450717	Thomas L.	Stack Jr.	M
450745	Timmy	Stackpole	M
450731	Timothy (I	Stack	M
450732	Timothy (I	Stack	M
799079	Valerie	Stack Dodg	F
450733	Walt	Stack	M
450734	Wesley	Stack	M
450735	William	Stack	M

SQL > Exercises

Fame Name Game

We all want our kids to be actors (...right), so what's the best first name and last name to give them? What are the 10 most popular first names? What are the 10 most popular last names? What about what are the most popular full_names (first AND last names)?

Hint: Collapsing selections

Click to toggle hint ▾

You will need to *group* your counts...

Hint: Ordering by groups

Click to toggle hint ▾

You will need to *alias* your counts...

Hint: Shortening the list

Click to toggle hint ▾

You need to *limit* your results...

Hint: How to concatenate in sqlite3

Click to toggle hint ▾

The string concatenation operator ("||") returns a text result :D

Hint: Output: most popular first names

Click to toggle hint ▾

first_name	occurrences
-----	-----
John	4371
Michael	3997
David	3843
Robert	3376
Peter	3066
Paul	2973
Richard	2397

Richard	2099
James	2096
Mark	2081
Frank	1918

Hint: Output: most popular last names

Click to toggle hint 

last_name	occurrences
-----	-----
Smith	2425
Lee	1878
Williams	1753
Jones	1727
Johnson	1634
Brown	1571
Miller	1294
Davis	1259
Taylor	1184
Wilson	1162

Hint: Output: most popular full names

Click to toggle hint 

full_name	occurrences
-----	-----
Shauna MacDonald	4
Fernando De Sori	3
Fernando de Sori	3
Noemí del Casti	3
Paola Del Medico	3
Shauna Macdonald	3
Alfonso Del Real	2
Claude d'Yd	2
James (I) MacDon	2
Javier Van de Co	2

SQL > Exercises

Prolific

List the top 100 most active actors and the number of roles they have starred in.

Hint: Combining information

Click to toggle hint

You need to *join* some tables, and maybe *group* some rows...

Hint: Expected results

Click to toggle hint

first_name	last_name	role_count
-----	-----	-----
Mel	Blanc	909
Bess	Flowers	672
Tom	London	549
Adoor	Bhasi	544
Edmund	Cobb	544
Bud	Osborne	544
Lee	Phelps	543
Prem	Nazir	498
Oliver	Hardy	450
Emmett	Vogan	447
Frank (I)	Ellis	446
Lee (I)	Moran	444
Irving	Bacon	437
Jack	Mower	433
Stanley	Blystone	432
Wade	Boteler	423
Frank	Welker	422
Sung-il	Shin	408
George (I)	Chesebro	403
Charles (II)	King	402
Jack	Mulhall	402
Ernie (I)	Adams	397

Ernie (I)	Stams	397
Stuart	Holmes	397
Francis	Ford	391
Victor	Potel	391
Ron	Jeremy	381
James	Flavin	379
Vernon	Dent	377
Jack (I)	Richardson	377
Frank (I)	O'Connor	376
Bud	Jamison	375
Wilfred	Lucas	372
Selmer	Jackson	371
Charles (I)	Sullivan	365
Herman	Hack	363
Harry	Strang	361
George	Chandler	358
Fred	Kelsey	354
Syd	Saylor	354
Eddie	Lyons	353
Raymond	Hatton	349
Milton	Kibbee	348
Mack	Sennett	348
Leo (I)	White	347
Hank	Bell	345
Robert	Homans	345
Forrest	Taylor	345
Gilbert M. '	Anderson	344
Herbert	Rawlinson	344
Edgar	Kennedy	341
Pierre	Watkin	340
Peter (I)	North	339
Byron	Foulger	338
Robert	Mammone	338
Edward	Peil Sr.	336
Harry	Todd	336
Billy	Franey	335
Lee	Shumway	335
Lafe	McKee	333
Pat (I)	O'Malley	332
Lalita	Pawar	332
Edward (I)	Earle	329
Slim	Whitaker	329
Mae	Questel	329

Mac	Questet	329
Donald (I)	Kerr	328
Tom	Mix	326
Joseph	Crehan	325
Edward	Hearn	325
Jack (I)	Kirk	322
Lester	Dorr	321
Lane	Chandler	319
Stanley (I)	Andrews	318
William B.	Davidson	318
Mickey (I)	Rooney	318
Jimmy	Aubrey	317
Rupert	Jee	317
J. Farrell	MacDonald	317
Heinie	Conklin	316
George	Morrell	310
Roy	Barcroft	309
John (I)	Hamilton	309
Horace B.	Carpenter	307
Claire	McDowell	307
Usha	Sharabhai	307
Bunsri	Sribunruttanach	306
Henry B.	Walthall	304
Frank	Hagney	303
'Snub'	Pollard	303
Arthur V.	Johnson	302
Jack	Mercer	299
Carl	Stockdale	298
Andy	Clyde	297
Eddie	Dunn	297
Tanvir	Mohan	297
Paul	Panzer	297
King (I)	Baggot	296
Roberto	Cañedo	296
Harry (II)	Harvey	295
Florence	Lawrence	295
Thikkurisi S	Nair	294

SQL > Exercises

Bottom of the Barrel

How many movies does IMDB have of each genre, ordered by least popular genre?

Hint: Inconsistent data

Click to toggle hint

Do all `movies_genres` instances point to a movie in the `movies` table? If not, maybe we should join on `movies` and only include movies that have been made in our count.

Hint: Expected results

Click to toggle hint

genre	num_movies_by_genres
-----	-----
Film-Noir	410
War	4354
Mystery	4868
Sci-Fi	4937
Fantasy	5087
Music	5554
Musical	6971
Horror	7049
Adult	7349
Western	8367
Adventure	8763
Thriller	10532
Family	11104
Crime	12528
Romance	13631
Action	14455
Animation	17661
Documentar	41367
Comedy	56456
Drama	72981
Short	81026

SQL > Exercises

Braveheart

List the first and last names of all the actors who played in the **1995** movie 'Braveheart', arranged alphabetically by last name.

Hint: Making some jumps

Click to toggle hint

You can join multiple tables — and will have to, in this case.

Hint: Expected results

Click to toggle hint

first_name	last_name
-----	-----
Alun	Armstrong
Julie (I)	Austin
Ian	Bannen
Joanne	Bett
Stephen	Billington
Michael (I	Byrne
Mhairi	Calvey
Liam	Carney
Jimmy	Chisholm
Fred	Chiverton
Daniel	Coli
James	Cosmo
Brian (I)	Cox
Martin (I)	Dempsey
Martin	Dunne
Tommy (I)	Flanagan
David (I)	Gant
Donal	Gibson
Mel (I)	Gibson
Brendan	Gleeson
Peter	Hanly

Peter	Nahy
Bernard	Horsfall
John (I)	Kavanagh
Phil (I)	Kelly
Jimmy	Keogh
Sean	Lawlor
Richard	Leaf
Dean	Lopata
Angus	Macfadyen
Sophie	Marceau
Jeanne	Marine
Catherine	McCormack
Sean	McGinley
Patrick	McGoohan
Barry	McGovern
David (II)	McKay
Gerard	McSorley
Peter	Mullan
Bill	Murdoch
Martin (I)	Murphy
John	Murtagh
Sandy (II)	Nelson
Alex	Norton
Niall	O'Brien
David (I)	O'Hara
Jer	O'Leary
Robert	Paterson
Ralph	Riach
James (II)	Robinson
Joe	Savino
William	Scott-Mass
Gerda	Stevenson
Alan	Tall
Malcolm	Tierney
Paul (IV)	Tucker
Rupert	Vansittart
Ryan (III)	Wallace
Andrew	Weir
Tam	White
Mal	Whyte

SQL > Exercises

Leap Noir

List all the directors who directed a 'Film-Noir'-genre movie in a leap year (for the sake of this challenge, pretend that all years divisible by 4 are leap years — which is **not true** in real life). Your query should return director name, the movie name, and the year, sorted by movie name.

Hint: Math

Click to toggle hint

Remember, WHERE clause conditions can parse basic operators... like modulo (%).

Hint: Expected results

Click to toggle hint

first_name	last_name	name	year
-----	-----	-----	-----
Fred	Zinnemann	Act of Violence	1948
Vincent	Sherman	Affair in Trini	1952
Otto	Preminger	Angel Face	1952
Charles	Brabin	Beast of the Ci	1932
Budd	Boetticher	Behind Locked D	1948
Jacques	Tourneur	Berlin Express	1948
Harry	Horner	Beware, My Love	1952
Fritz (I)	Lang	Beyond a Reason	1956
John (I)	Farrow	Big Clock, The	1948
Jack	Bernhard	Blonde Ice	1948
Richard	Fleischer	Bodyguard	1948
Henry	Hathaway	Call Northside	1948
Robert (I)	Wise	Captive City, T	1952
Robert	Siodmak	Christmas Holid	1944
Anatole	Litvak	City for Conque	1940
Jean	Negulesco	City for Conque	1940
Ricardo (I	Cortez	City of Chance	1940
Fritz (I)	Lang	Clash by Night	1952
Lee	Sholem	Crime Against J	1956

Lee	Shedden	Criminals Against S	1956
Frank (I)	Tuttle	Cry in the Nigh	1956
Robert	Siodmak	Cry of the City	1948
Rudolph	Maté	Dark Past, The	1948
André	De Toth	Dark Waters	1944
Billy	Wilder	Double Indemnity	1944
Abraham	Polonsky	Force of Evil	1948
Fritz (I)	Lang	Fury	1936
Ricardo (I)	Cortez	Girl in 313	1940
John	Brahm	Guest in the Ho	1944
André	De Toth	Guest in the Ho	1944
Lewis	Milestone	Guest in the Ho	1944
Mark (I)	Robson	Harder They Fal	1956
Anthony (I)	Mann	He Walked by Ni	1948
Alfred L.	Werker	He Walked by Ni	1948
Steve (I)	Sekely	Hollow Triumph	1948
Joseph	Kane	Hoodlum Empire	1952
Jack	Bernhard	Hunted, The	1948
Mervyn	LeRoy	I Am a Fugitive	1932
Byron	Haskin	I Walk Alone	1948
William	Nigh	I Wouldn't Be i	1948
Phil	Karlson	Kansas City Con	1952
John (I)	Huston	Key Largo	1948
Budd	Boetticher	Killer Is Loose	1956
Stanley	Kubrick	Killing, The	1956
Gerd	Oswald	Kiss Before Dyi	1956
Norman (I)	Foster	Kiss the Blood	1948
Robert (I)	Stevenson	Las Vegas Story	1952
Rouben	Mamoulian	Laura	1944
Otto	Preminger	Laura	1944
William	Wyler	Letter, The	1940
Seymour	Friedman	Loan Shark	1952
Nicholas	Ray	Macao	1952
Josef	von Sternb	Macao	1952
Jean	Negulesco	Mask of Dimitri	1944
Fritz (I)	Lang	Ministry of Fea	1944
Frank	Borzage	Moonrise	1948
Edward	Dmytryk	Murder, My Swee	1944
Jules	Dassin	Naked City, The	1948
Richard	Fleischer	Narrow Margin,	1952
John (I)	Farrow	Night Has a Tho	1948
Roy Ward	Baker	Night Without S	1952
Maxwell	Shane	Nightmare	1956

Maxwell	Shane	Nightmare	1950
Nicholas	Ray	On Dangerous Gr	1952
Robert	Siodmak	Phantom Lady	1944
André	De Toth	Pitfall	1948
Abner	Biberman	Price of Fear,	1956
Lewis	Milestone	Racket, The	1928
Anthony (I	Mann	Raw Deal	1948
Jean	Negulesco	Road House	1948
Edgar G.	Ulmer	Ruthless	1948
Phil	Karlson	Scandal Sheet	1952
Fritz (I)	Lang	Secret Beyond t	1948
Douglas	Sirk	Sleep, My Love	1948
Allan	Dwan	Slightly Scarle	1956
Edward	Dmytryk	Sniper, The	1952
Anatole	Litvak	Sorry, Wrong Nu	1948
Hugo	Haas	Strange Fascina	1952
Boris	Ingster	Stranger on the	1940
William	Keighley	Street with No	1948
David (I)	Miller	Sudden Fear	1952
David (I)	Bradley	Talk About a St	1952
Russell	Rouse	Thief, The	1952
William	Dieterle	Turning Point,	1952
William	Castle	When Strangers	1944
Fritz (I)	Lang	While the City	1956
Arnold	Laven	Without Warning	1952
Alfred (I)	Hitchcock	Wrong Man, The	1956

SQL > Conclusion

Epilogue

Progress Rubric

Databases in general, and SQL in specific, are such important and deep topics that it is possible to base an entire career on them. This workshop serves as an introduction to writing raw SQL queries, and explaining certain concepts like join tables, so that you can gain an appreciation for the possibilities of using a Structured Query Language. The exercises are deliberately complex even beyond those of a normal database user's daily queries; this is both to provide challenge and to show you how powerful SQL can be. Therefore, do not worry that you will be required to write similarly complex queries. Indeed, after learning an Object Relational Mapper (e.g. Sequelize), you will hardly write any queries at all! Still, it is important for you to be comfortable with at least fundamental CRUD operations via SQL.

Main Takeaways

Relational Database Fundamentals

SQL term	Relational logic term	Description
Table	Relation	a collection of rows (tuples/instances) with the same columns (fields/attributes)
Row	Tuple or Instance	an item, described by columns (fields/attributes)
Column	Field or Attribute	An attribute of an item, e.g. "name"

- Schemas
 - Blueprint for a table; different from content (data adhering to a schema)
 - Field types (e.g. `INTEGER` , `STRING` , etc.)
 - Primary keys uniquely identify rows in a table

- Primary keys uniquely identify rows in a table
- Foreign keys refer to rows in other tables
- Database Management System (DBMS)
 - A program which receives database queries (written in SQL) and translates them to disk reads/writes
 - Manages the nuts and bolts of persisting data on disk in an efficient, performant way — highly researched
 - Uses special data structures and algorithms, e.g. B-Trees (different from, but similar to, Binary Search Trees).
 - "Protects" most programmers from having to think about such difficult topics and implementing them all over again

Fundamentals of SQL

- Shared syntax for making database queries
- Different "dialects" based on specific RDBMS, e.g. MySQL, SQLite, PostgreSQL
- Declarative — state what you want (DBMS translates into an actual execution plan)
- Joins and frequency
 - Inner join (common)
 - Left join (common)
 - Right join (common)
 - Full join (less common)
- SQL description and order of common commands
 - SELECT - determine/filter columns
 - FROM & JOIN s - determine/filter rows
 - WHERE - filter rows
 - GROUP BY - combines rows into groups
 - HAVING - filters groups
 - ORDER BY - arranges remaining rows/groups
 - LIMIT - truncates the results
- SQL commands
 - SELECT
 - AS
 - INSERT
 - DELETE
 - UPDATE
 - FROM
 - JOIN
 - ON
 - WHERE
 - LIKE
 - AND
 - ORDER BY ASC DESC

- ORDER BY, ASC, DESC
- LIMIT
- DISTINCT
- GROUP BY
- COUNT
- IN
- INTERSECT
- EXISTS
- NOT



PREVIOUS LESSON

[Bonus Exercise: Building Your Project](#)

NEXT LESSON



[Feedback: Let us know what you think!](#)