

Ex7_LuisZüttel_GionRubitschung_D1P

April 23, 2024

```
[ ]: %load_ext sql
      %config SqlMagic.displaylimit = None
```

The 'toml' package isn't installed. To load settings from pyproject.toml or ~/.
↳jupyter/config, install with: pip install toml

displaylimit: Value None will be treated as 0 (no limit)

1 Aufgabe 1 (Komplexere Abfragen)

Realisieren Sie folgende Aufgaben in publications.db. (Schema auf einen früheren Übungsblatt).

```
[ ]: %sql sqlite:///../data/publications.db
```

Connecting to 'sqlite:///../data/publications.db'

1. Bestimmen Sie für jeden Laden und jeden Autor den Gesamtpreis der von diesem Autor in diesem Laden verkauften Bücher (ohne Discounts), absteigend sortiert.

```
[ ]: %%sql

with total_quantity_per_store_and_title as (
    SELECT sd.stor_id, sd.title_id, sum(sd.qty) as total_quantity
    from salesdetail sd
    group by sd.stor_id, sd.title_id)

SELECT au.au_fname, au.au_lname, st.stor_name, ROUND(sum(t.price * tq.
↳total_quantity),2) as revenue
from authors au
join titleauthor ta on au.au_id = ta.au_id
join titles t on ta.title_id = t.title_id
join total_quantity_per_store_and_title tq on t.title_id = tq.title_id
join stores st on st.stor_id = tq.stor_id
group by au.au_id, st.stor_id
order by au.au_id, revenue desc
```

Running query in 'sqlite:///../data/publications.db'

```
[ ]: +-----+-----+-----+-----+
      | au_fname | au_lname | stor_name | revenue |
      +-----+-----+-----+-----+
```

Johnson	White	Thoreau Reading Discount Chain	68705.63
Johnson	White	News & Brews	6896.55
Johnson	White	Eric the Read Books	3998.0
Johnson	White	Bookbeat	1799.1
Marjorie	Green	Thoreau Reading Discount Chain	106896.0
Marjorie	Green	Doc-U-Mat: Quality Laundry and Books	10999.2
Marjorie	Green	Bookbeat	8414.26
Marjorie	Green	Eric the Read Books	7398.45
Marjorie	Green	News & Brews	3406.34
Marjorie	Green	Barnum's	598.0
Marjorie	Green	Fricative Bookshop	125.58
Cheryl	Carson	Thoreau Reading Discount Chain	181029.6
Cheryl	Carson	Bookbeat	12232.35
Cheryl	Carson	Barnum's	6885.0
Cheryl	Carson	News & Brews	780.3
Cheryl	Carson	Fricative Bookshop	573.75
Michael	O'Leary	Thoreau Reading Discount Chain	83342.55
Michael	O'Leary	Doc-U-Mat: Quality Laundry and Books	7174.2
Michael	O'Leary	Barnum's	5246.5
Michael	O'Leary	Fricative Bookshop	5187.25
Michael	O'Leary	Bookbeat	4660.5
Michael	O'Leary	News & Brews	2091.25
Dick	Straight	Thoreau Reading Discount Chain	66666.65
Dick	Straight	News & Brews	7196.4
Dick	Straight	Bookbeat	5997.0
Dick	Straight	Barnum's	1999.0
Abraham	Bennet	Thoreau Reading Discount Chain	53973.0
Abraham	Bennet	Doc-U-Mat: Quality Laundry and Books	10894.55
Abraham	Bennet	Bookbeat	7876.06
Abraham	Bennet	Eric the Read Books	6396.8
Abraham	Bennet	News & Brews	2718.64
Ann	Dull	Thoreau Reading Discount Chain	68200.0
Ann	Dull	Barnum's	7000.0
Ann	Dull	News & Brews	6700.0
Burt	Gringlesby	Thoreau Reading Discount Chain	53814.1
Burt	Gringlesby	Barnum's	5246.5
Burt	Gringlesby	Doc-U-Mat: Quality Laundry and Books	1199.2
Burt	Gringlesby	Fricative Bookshop	1124.25
Chastity	Locksley	Thoreau Reading Discount Chain	17625.94
Chastity	Locksley	Eric the Read Books	3995.0
Chastity	Locksley	News & Brews	1997.5
Chastity	Locksley	Barnum's	1598.0
Chastity	Locksley	Bookbeat	1438.2
Reginald	Blotch-Halls	Thoreau Reading Discount Chain	140412.5
Reginald	Blotch-Halls	Bookbeat	9273.2
Reginald	Blotch-Halls	Barnum's	8723.5

Reginald	Blotch-Halls	Fricative Bookshop	7468.75
Reginald	Blotch-Halls	News & Brews	6751.75
Reginald	Blotch-Halls	Doc-U-Mat: Quality Laundry and Books	4182.5
Reginald	Blotch-Halls	Eric the Read Books	3585.0
Akiko	Yokomoto	Thoreau Reading Discount Chain	53814.1
Akiko	Yokomoto	Barnum's	5246.5
Akiko	Yokomoto	Doc-U-Mat: Quality Laundry and Books	1199.2
Akiko	Yokomoto	Fricative Bookshop	1124.25
Innes	del Castillo	Thoreau Reading Discount Chain	40619.68
Michel	DeFrance	Thoreau Reading Discount Chain	59351.5
Michel	DeFrance	Bookbeat	2209.61
Michel	DeFrance	Eric the Read Books	1943.5
Michel	DeFrance	Doc-U-Mat: Quality Laundry and Books	1605.63
Michel	DeFrance	News & Brews	807.3
Michel	DeFrance	Barnum's	598.0
Stearns	MacFeather	Thoreau Reading Discount Chain	37624.7
Stearns	MacFeather	Doc-U-Mat: Quality Laundry and Books	5975.0
Stearns	MacFeather	Bookbeat	4660.5
Stearns	MacFeather	Fricative Bookshop	4063.0
Stearns	MacFeather	News & Brews	2091.25
Livia	Karsen	Thoreau Reading Discount Chain	8096.25
Sylvia	Panteley	Eric the Read Books	2618.75
Sylvia	Panteley	Thoreau Reading Discount Chain	1780.75
Sylvia	Panteley	Fricative Bookshop	1571.25
Sylvia	Panteley	Doc-U-Mat: Quality Laundry and Books	1047.5
Sylvia	Panteley	Bookbeat	838.0
Sheryl	Hunter	Thoreau Reading Discount Chain	68200.0
Sheryl	Hunter	Barnum's	7000.0
Sheryl	Hunter	News & Brews	6700.0
Anne	Ringer	Thoreau Reading Discount Chain	79554.25
Anne	Ringer	News & Brews	2997.3
Anne	Ringer	Bookbeat	2209.61
Anne	Ringer	Eric the Read Books	1943.5
Anne	Ringer	Doc-U-Mat: Quality Laundry and Books	1605.63
Anne	Ringer	Barnum's	598.0
Albert	Ringer	Thoreau Reading Discount Chain	20202.75
Albert	Ringer	News & Brews	2190.0
Albert	Ringer	Bookbeat	777.0

2. Bestimmen Sie alle Autoren, die weniger psychology Bücher herausgegeben haben als Livia Karsen.

```
[ ]: %%sql

select * from authors
where au_id not in (
```

```

select distinct a.au_id from authors as a
  natural join titleauthor as ta
  natural join titles as t
group by a.au_lname, a.au_fname
having count(*) >= (
  select count(*) as published_psy_books from authors as a
    natural join titleauthor as ta
    natural join titles as t
  where t.type like 'psychology%'
  and a.au_lname = 'Karsen' and a.au_fname = 'Livia'
)
);

```

Running query in 'sqlite:///../data/publications.db'

```

[ ]: +-----+-----+-----+-----+-----+-----+
      | au_id   | au_lname | au_fname | phone   | address      |
city  | state  | country | postalcode |
+-----+-----+-----+-----+-----+-----+
      | 893-72-1158 | McBadden | Heather  | 707 448-4982 | 301 Putnam    |
Vacaville | CA   | USA   | 95688      |
      | 724-08-9931 | Stringer | Dirk     | 415 843-2991 | 5420 Telegraph Av. |
Oakland  | CA   | USA   | 94609      |
      | 527-72-3246 | Greene   | Morningstar | 615 297-2723 | 22 Graybar House Rd. |
Nashville | TN   | USA   | 37215      |
      | 341-22-1782 | Smith    | Meander   | 913 843-0462 | 10 Mississippi Dr. |
Lawrence | KS   | USA   | 66044      |
+-----+-----+-----+-----+-----+-----+
      |
+-----+-----+-----+-----+

```

3. Geben Sie für jedes Buch seinen Titel, Preis, Anzahl bisher verkaufter Exemplare sowie die effektiv geschuldeten Tantiemen an. (Die pro Buch geschuldete Tantieme in Prozent des Verkaufspreises ist in der Spalte *royalty* in Abhängigkeit von den Verkaufszahlen angegeben)

```

[ ]: %%sql

select title, price, total_sales, (total_sales * royalty)/ 100 as tantiemen
from titles
      inner join roysched on titles.title_id = roysched.title_id
group by titles.title_id;

```

Running query in 'sqlite:///../data/publications.db'

```

[ ]: +-----+-----+-----+-----+-----+-----+
      |
+-----+-----+
      | title                                     | price |
total_sales | tantiemen |

```

			-----+-----+-----	
			-----+-----+-----	
		The Busy Executive's Database Guide	19.99	
4095	409			
		Cooking with Computers: Surreptitious Balance Sheets	11.95	
3876	387			
		You Can Combat Computer Stress!	2.99	
18722	1872			
		Straight Talk About Computers	19.99	
4095	409			
		Silicon Valley Gastronomic Treats	19.99	
2032	203			
		The Gourmet Microwave	2.99	
22246	2224			
		But Is It User Friendly?	22.95	
8780	878			
		Secrets of Silicon Valley	20	
4095	409			
		Computer Phobic and Non-Phobic Individuals: Behavior Variations	21.59	
375	37			
		Is Anger the Enemy?	10.95	
2045	204			
		Life Without Fear	7	
111	11			
		Prolonged Data Deprivation: Four Case Studies	19.99	
4072	407			
		Emotional Security: A New Algorithm	7.99	
3336	333			
		Onions, Leeks, and Garlic: Cooking Secrets of the Mediterranean	20.95	
375	37			
		Fifty Years in Buckingham Palace Kitchens	11.95	
15096	1509			
		Sushi, Anyone?	14.99	
4095	409			
			-----+-----+-----	
			-----+-----+-----	

4. Testen Sie, ob die Werte des Attributs `total_sales` korrekt sind, indem Sie alle Buchtitel mit falschen Werte zusammen mit den Werten ausgeben.

```
[ ]: %%sql

with total_sales_per_book as (
  SELECT sd.title_id, sum(sd.qty) as quantity_sum
  from salesdetail sd
  group by sd.title_id
)
```

```
select t.title, ts.quantity_sum, t.total_sales
from titles t
left join total_sales_per_book ts on t.title_id = ts.title_id
group by t.title, ts.quantity_sum, t.total_sales
having ts.quantity_sum <> t.total_sales;
```

Running query in 'sqlite:///../data/publications.db'

```
[ ]: +-----+-----+-----+
      | title | quantity_sum | total_sales |
      +-----+-----+-----+
      +-----+-----+-----+
```

5. Geben Sie die Läden an, die schon Bücher aller Typen verkauft haben.

```
[ ]: %%sql

select stor_name from titles
      inner join salesdetail on titles.title_id = salesdetail.title_id
      inner join stores on salesdetail.stor_id = stores.stor_id
group by stores.stor_id
having count(distinct type) = (
      select COUNT(distinct type) from titles
);
```

Running query in 'sqlite:///../data/publications.db'

```
[ ]: +-----+
      | stor_name |
      +-----+
      +-----+
```

2 Aufgabe 2 (komplexere Abfragen, Trigger)

Realisieren Sie folgende Aufgaben in university.db.

```
[ ]: %%sql sqlite:///../data/university.db
```

Connecting and switching to connection 'sqlite:///../data/university.db'

1. Finde alle Kursdurchführungen, die miteinander in Konflikt stehen, d.h. die dazu führe, dass ein Dozent zur gleichen Zeit an unterschiedlichen Orten sein muss.

```
[ ]: %%sql

select * from instructor
inner join teaches on instructor.ID = teaches.ID
inner join section on
      teaches.course_id = section.course_id
      and teaches.sec_id = section.sec_id
```

```

        and teaches.semester = section.semester
        and teaches.year = section.year
group by instructor.ID, teaches.semester, teaches.year, time_slot_id
having count(instructor.ID) != (
    select count(instructor.id) from instructor
    inner join teaches on instructor.ID = teaches.ID
    inner join section on
        teaches.course_id = section.course_id
        and teaches.sec_id = section.sec_id
        and teaches.semester = section.semester
        and teaches.year = section.year
    group by instructor.ID, teaches.semester, teaches.year, time_slot_id,
↳building, room_number
);

```

Running query in 'sqlite:///../data/university.db'

```

[ ]: +---+-----+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+-----+-----+
-----+
| ID | name | dept_name | salary | ID_1 | course_id | sec_id | semester | year |
course_id_1 | sec_id_1 | semester_1 | year_1 | building | room_number |
time_slot_id |
+---+-----+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+-----+-----+
-----+
+---+-----+-----+-----+-----+-----+-----+-----+
+-----+-----+-----+-----+-----+-----+-----+-----+
-----+

```

2. Verhindern Sie mithilfe von Triggern, dass miteinander in Konflikt stehende Kursdurchführungen eingetragen werden.

```

[ ]: %%sql

create trigger insert_check_redundant_section
after insert on section
for each row
when(
    new.room_number in (
        select room_number from section
        where time_slot_id = new.time_slot_id
            and year = new.year
            and semester = new.semester
        )
    )
begin
select raise(rollback, "on insert section with timeslot already exists");

```

```

end;

create trigger update_check_redundant_section
before update on section
when (
    new.room_number in (
        select room_number from section
        where time_slot_id = new.time_slot_id
            and year = new.year
            and semester = new.semester
        )
    )
begin
select raise(rollback, "on update section with timeslot already exists");
end;

```

Running query in 'sqlite:///../data/university.db'

```

[ ]: ++
    ||
    ++
    ++

```