

1. Introduction, database creating and data inserting

After finishing the Udemy course (<https://www.udemy.com/course/sql-dla-pocztakujacych-postgresql-z-podrecznikiem-pdf/>), I wanted to create a new project and use all needed commands and functions. Because all databases available on the Internet were impossible to recovery, I create my own database with Mockaroo using.

Table definitions with special notes (creator doesn't allow to hand over the keys).

artist

```
create table artist (  
    artist_id INT PRIMARY KEY,  
    band_id INT,  
    first_name VARCHAR(50),  
    last_name VARCHAR(50),  
    style VARCHAR(6),  
    date DATE  
);
```

Field Name	Type	Options
artist_id	Row Number	blank: 0 % Σ X
band_id	DUNS Number	blank: 0 % Σ X
first_name	First Name	blank: 0 % Σ X
last_name	Last Name	blank: 0 % Σ X
style	Custom List	rock, pop, rap, reggae random blank: 0 % Σ X
date	Datetime	01/01/1950 to 12/24/2010 format: yyyy-mm-dd blank: 0 % Σ X

define band_id defined as random(1, 100)

band

```
create table band (  
    band_id INT PRIMARY KEY,  
    band_name VARCHAR(50),  
    date DATE,  
    country VARCHAR(50)  
);
```

Field Name	Type	Options
band_id	Row Number	blank: 0 % Σ X
band_name	Fake Company Name	blank: 0 % Σ X
date	Datetime	01/01/1970 to 01/01/2020 format: yyyy-mm-dd blank: 0 % Σ X
country	Country	restrict countries... blank: 0 % Σ X

CD

```
create table cd (  
    cd_id INT PRIMARY KEY,  
    artist_id INT,  
    band_id INT,  
    title VARCHAR(50),  
    release_date DATE,  
    genre VARCHAR(50)
```

```

    cd_id INT PRIMARY KEY,
    band_id INT,
    title VARCHAR(300),
    year INT
);

```

Field Name	Type	Options
cd_id	Row Number	blank: 0 % Σ ✕
band_id	DUNS Number	blank: 0 % Σ ✕
title	Movie Title	blank: 0 % Σ ✕
year	Car Model Year	blank: 0 % Σ ✕

```

define band_id defined as random(1, 100)

```

song

```

create table song (
    song_id INT PRIMARY KEY,
    cd_id INT,
    title TEXT,
    band_id INT
);

```

Field Name	Type	Options
song_id	Row Number	blank: 0 % Σ ✕
cd_id	DUNS Number	blank: 0 % Σ ✕
title	Words	at least 1 but no more than 6 blank: 0 % Σ ✕
band_id	DUNS Number	blank: 0 % Σ ✕

```

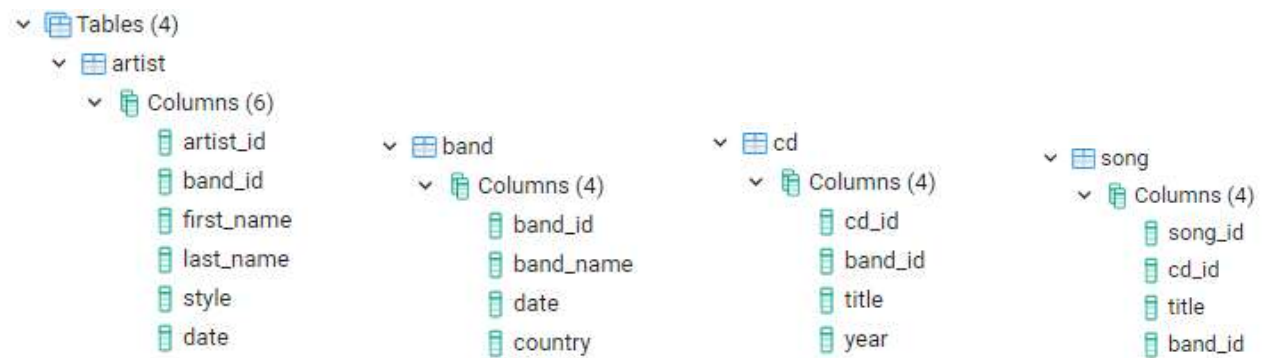
define cd_id defined as random(1, 100)

```

```

define band_id defined as random(1, 100)

```



2. Inserting records

An example adding values to a CD table (first 3 rows)

```
INSERT INTO cd (cd_id, band_id, title, year) VALUES (1, 88, 'Tonight You're Mine', 2013);
```

```
INSERT INTO cd (cd_id, band_id, title, year) VALUES (2, 61, 'Cowboys & Aliens', 1995);
```

```
INSERT INTO cd (cd_id, band_id, title, year) VALUES (3, 61, 'Fallen', 1984);
```

3. Displaying columns (+ alias)

1) Displaying all columns of the 'band' table

```
SELECT * FROM band
```

2) Displaying columns: 'first_name', 'style', 'date' with 'artist' table

```
SELECT
    a.first_name,
    a.style,
    a.date
FROM artist as a
```

4. Selecting lines (with logical conditions, logical operators and text filtering)

1) Displaying artist_id, first_name, style and date (is a birth date) of artist borned after 2000 and creating rap.

```
SELECT
    artist_id,
    first_name,
    date
FROM artist
WHERE style = 'rap' AND date >= '2000-01-01'
```

Data Output		Explain	Messages	Notifications
	artist_id [PK] integer	first_name character varying (50)	date date	style character varying (6)
1	15	Coral	2005-02-26	rap
2	50	Royal	2004-09-30	rap
3	80	Marshal	2006-06-08	rap
4	82	Ernaline	2004-08-17	rap
5	88	Lizette	2001-10-28	rap
6	89	Link	2001-08-28	rap

- 2) Displaying cd_id, title of cds recorded before 1995 or title contain letter 'a' (before and after can be letters and the length is indifferent)

SELECT

cd_id,

title,

year

FROM cd

WHERE year < 1995 OR title ILIKE '_a_'

	cd_id [PK] integer	title character varying (300)	year integer
1	3	Fallen	1984
2	13	Enduring Love	1991
3	36	Games of Love and Chance (L'esquive)	1993
4	39	Comin' at Ya!	1994
5	40	New One-Armed Swordsman, The (Xin du bi dao)	1993
6	49	Farewell (L'affaire Farewell)	1994
7	53	Do You Like Hitchcock? (Ti piace Hitchcock?)	1994
8	58	Brasher Doubloon, The	1990
9	65	A Fugitive from the Past	1983
10	66	Golden Thread, The (Subarnarekha)	1991
11	76	11-11-11 (11-11-11: The Prophecy)	1990
12	81	Kindred, The	1984
13	87	Abbott and Costello Meet the Mummy	1992
14	99	Already Dead	1994
15	100	Whiteboyz	1992

- 3) Show cd_id, title, band_id, and year for cd's table if title contains letters 'an' (words can contain other letters after and before 'an') and was recorded at 2000 or if band_id is between 50 and 57.

SELECT

cd_id,

title,
year,
band_id

FROM cd

WHERE (title ILIKE '%an%' AND year = 2000) OR (band_id >= 50 AND band_id <= 57)

	Data Output	Explain	Messages	Notifications
	 cd_id [PK] integer 	title character varying (300) 	year integer 	band_id integer 
1	13	Enduring Love	1991	50
2	19	Annapolis	1999	57
3	59	Shade	2002	50
4	73	Notti bianche, Le (White Nights)	2008	53
5	74	Fantastic Voyage	2000	17
6	86	Viva Max!	1995	55

5. Unique value

Showing all countries of bands origin

SELECT DISTINCT

country

FROM band

6. Limit of records and sorting

1) Displaying all artist data if last name has 5 letters, ending by 'e' or if band_id is between 5 and 30.

SELECT

*

FROM artist

WHERE last_name LIKE '____e' OR band_id BETWEEN 5 AND 30

Data Output		Explain	Messages	Notifications		
	artist_id [PK] integer	band_id integer	first_name character varying (50)	last_name character varying (50)	style character varying (6)	date date
1	3	11	Mikel	Hertwell	rock	2010-10-30
2	4	11	Joseph	Coan	reggae	1964-12-16
3	6	10	Dorain	Tommasetti	pop	1984-04-27
4	17	15	Nonna	Joblin	pop	1963-08-25
5	18	15	Baudoin	Clemoes	rock	1951-04-07
6	19	27	Red	Duckham	rap	1995-03-13
7	23	9	Lenna	Tringham	rock	1987-09-12
8	34	32	Merna	Tille	pop	2010-02-24
9	35	18	Laura	Efford	rock	1999-08-18
10	39	29	Sharia	Haughin	reggae	1963-08-31
11	41	16	Neil	Normanville	pop	1967-06-22
12	43	25	Julita	Perillio	pop	2009-12-29
13	45	8	Annette	Morrish	pop	1966-10-05
14	51	59	Elly	Marfe	pop	1959-01-28
15	53	29	Bendite	Letch	reggae	1983-12-21
16	60	7	Malcolm	Tungay	reggae	1971-06-10
17	61	32	Katalin	Drane	rock	2008-10-18
18	63	8	Jule	Shackell	rap	1995-03-28
19	69	8	Adela	Lippatt	pop	1997-02-24
20	70	5	Davon	Flanigan	pop	1957-01-26
21	72	10	Wash	McPeck	pop	1987-11-16
22	80	12	Marshal	Hansell	rap	2006-06-08
23	86	28	Arlina	Ancliffe	reggae	1991-04-03
24	93	54	Miner	Wayne	reggae	1961-09-05
25	97	26	Dareen	Gethins	rock	1978-10-16

+ sorting by style (from Z to A)








SELECT

*

FROM artist

WHERE last_name LIKE '____e' OR (band_id BETWEEN 5 AND 30)

ORDER BY style DESC

Data Output		Explain	Messages	Notifications		
	artist_id [PK] integer 	band_id integer 	first_name character varying (50) 	last_name character varying (50) 	style character varying (6) 	date date 
1	3	11	Mikel	Hertwell	rock	2010-10-30
2	18	15	Baudoin	Clemones	rock	1951-04-07
3	23	9	Lenna	Tringham	rock	1987-09-12
4	35	18	Laura	Efford	rock	1999-08-18
5	61	32	Katalin	Drane	rock	2008-10-18
6	97	26	Dareen	Gethins	rock	1978-10-16
7	53	29	Bendite	Letch	reggae	1983-12-21
8	4	11	Joseph	Coan	reggae	1964-12-16
9	86	28	Arlina	Ancliffe	reggae	1991-04-03
10	39	29	Sharla	Haughin	reggae	1963-08-31
11	93	54	Miner	Wayne	reggae	1961-09-05
12	60	7	Malcolm	Tungay	reggae	1971-06-10
13	19	27	Red	Duckham	rap	1995-03-13
14	63	8	Jule	Shackell	rap	1995-03-28
15	80	12	Marshal	Hansell	rap	2006-06-08
16	43	25	Julita	Perillio	pop	2009-12-29
17	41	16	Neil	Normanville	pop	1967-06-22
18	72	10	Wash	McPeck	pop	1987-11-16
19	69	8	Adela	Lippatt	pop	1997-02-24
20	70	5	Davon	Flanigan	pop	1957-01-26
21	34	32	Merna	Tille	pop	2010-02-24
22	6	10	Doralin	Tommasetti	pop	1984-04-27
23	17	15	Nonna	Joblin	pop	1963-08-25
24	51	59	Elly	Marfe	pop	1959-01-28
25	45	8	Annette	Morrish	pop	1966-10-05

+ sorting by band_id

SELECT

*

FROM artist

WHERE last_name LIKE '____e' OR (band_id BETWEEN 5 AND 30)

ORDER BY style DESC, band_id

	artist_id [PK] integer	band_id integer	first_name character varying (50)	last_name character varying (50)	style character varying (6)	date date
1	23	9	Lenna	Tringham	rock	1987-09-12
2	3	11	Mikel	Hertwell	rock	2010-10-30
3	18	15	Baudoin	Clemoes	rock	1951-04-07
4	35	18	Laura	Efford	rock	1999-08-18
5	97	26	Dareen	Gethins	rock	1978-10-16
6	61	32	Katalin	Drane	rock	2008-10-18
7	60	7	Malcolm	Tungay	reggae	1971-06-10
8	4	11	Joseph	Coan	reggae	1964-12-16
9	86	28	Arlina	Ancliffe	reggae	1991-04-03
10	39	29	Sharla	Haughin	reggae	1963-08-31
11	53	29	Bendite	Letch	reggae	1983-12-21
12	93	54	Miner	Wayne	reggae	1961-09-05
13	63	8	Jule	Shackell	rap	1995-03-28
14	80	12	Marshal	Hansell	rap	2006-06-08
15	19	27	Red	Duckham	rap	1995-03-13
16	70	5	Davon	Flanigan	pop	1957-01-26
17	45	8	Annette	Morrish	pop	1966-10-05
18	69	8	Adela	Lippatt	pop	1997-02-24
19	6	10	Doralin	Tommasetti	pop	1984-04-27
20	72	10	Wash	McPeck	pop	1987-11-16
21	17	15	Nonna	Joblin	pop	1963-08-25
22	41	16	Neil	Normanville	pop	1967-06-22
23	43	25	Julita	Perillio	pop	2009-12-29
24	34	32	Merna	Tille	pop	2010-02-24
25	51	59	Elly	Marfe	pop	1959-01-28

+ limit of results (only 10 results without firstly 10)

SELECT

*

FROM artist

WHERE last_name LIKE '____e' OR (band_id BETWEEN 5 AND 30)

ORDER BY style DESC, band_id

LIMIT 10 OFFSET 10

Data Output

Explain

Messages

Notifications

	artist_id [PK] integer	band_id integer	first_name character varying (50)	last_name character varying (50)	style character varying (6)	date date
1	53	29	Bendite	Letch	reggae	1983-12-21
2	93	54	Miner	Wayne	reggae	1961-09-05
3	63	8	Jule	Shackell	rap	1995-03-28
4	80	12	Marshal	Hansell	rap	2006-06-08
5	19	27	Red	Duckham	rap	1995-03-13
6	70	5	Davon	Flanigan	pop	1957-01-26
7	45	8	Annette	Morrish	pop	1966-10-05
8	69	8	Adela	Lippatt	pop	1997-02-24
9	6	10	Doralin	Tommasetti	pop	1984-04-27
10	72	10	Wash	McPeck	pop	1987-11-16

- 2) Showing artist_id, band_id, first_name, last_name, style from table artists if first_name is begins with the letters 'L' , 'M' or 'A'. Grouping results by style and first_name and showing it for Z to A

SELECT

artist_id,

band_id,

first_name,

style

FROM artist

WHERE first_name LIKE 'L%' OR first_name LIKE 'M%' OR first_name LIKE 'A%'

ORDER BY style, first_name DESC

Data Output		Explain	Messages	Notifications		16	86	28	Arlina	reggae
	artist_id [PK] integer		band_id integer	first_name character varying (50)	style character varying (6)	17	5	3	Arlene	reggae
1		34	32	Merna	pop	18	22	42	Alley	reggae
2		10	93	Marys	pop	19	13	84	Akim	reggae
3		99	95	Mari	pop	20	37	60	Ainslie	reggae
4		16	4	Madelle	pop	21	95	87	Montgomery	rock
5		8	58	Lyda	pop	22	3	11	Mikel	rock
6		58	82	Lon	pop	23	26	65	Mar	rock
7		45	8	Annette	pop	24	94	53	Mamie	rock
8		69	8	Adela	pop	25	84	91	Luella	rock
9		80	12	Marshal	rap	26	67	86	Les	rock
10		88	37	Lizette	rap	27	23	9	Lenna	rock
11		89	36	Link	rap	28	35	18	Laura	rock
12		93	54	Miner	reggae	29	25	99	Lani	rock
13		74	55	Mead	reggae	30	2	90	Atalanta	rock
14		30	96	Mayne	reggae	31	31	1	Amery	rock
15		60	7	Malcolm	reggae					

7. Grouping and value aggregating

- 1) We need to show how many CDs was recorded by each band. Display band_id and CDs for each. Group sorted results by band_id and show firstly 20 results.

```

SELECT
    band_id,
    COUNT(cd_id) all_cds
FROM cd
GROUP BY band_id
ORDER BY band_id
LIMIT 20

```

Data Output		Explain	Messages
	band_id integer	all_cds bigint	
1	1	1	
2	3	1	
3	4	1	
4	5	1	
5	7	1	
6	8	1	
7	9	1	
8	11	1	
9	16	1	
10	17	2	
11	20	1	
12	21	1	
13	22	3	
14	23	3	
15	25	1	
16	26	1	
17	27	1	
18	28	2	
19	29	4	
20	30	1	

2) Counting bands in every country (and sort it by country)

```

SELECT
    country,
    COUNT(band_id)
FROM band
GROUP BY country

```

ORDER BY country

Data	Output	Explain	Messages	Notifications
	country character varying (50)		count bigint	
1	Afghanistan		1	
2	Azerbaijan		2	
3	Brazil		3	
4	Bulgaria		2	
5	Cambodia		1	
6	Canada		4	
7	Chile		1	
8	China		16	
9	Colombia		1	
10	Croatia		1	
11	Czech Republic		1	
12	Democratic Republic of the Congo		2	
13	Denmark		1	
14	Finland		2	
15	France		4	
16	Gambia		1	
17	Germany		1	
18	Indonesia		12	
19	Kenya			1
20	Macedonia			1
21	Malta			1
22	Mauritius			1
23	Mexico			3
24	Morocco			2
25	Nepal			1
26	Peru			3
27	Philippines			5
28	Poland			7
29	Portugal			2
30	Russia			6
31	South Africa			1
32	Spain			1
33	Sudan			1
34	Sweden			3
35	Tanzania			2
36	Ukraine			2
37	United States			1

+ with sorting by count of bands

SELECT

country,

COUNT(band_id) count

FROM band

GROUP BY country

ORDER BY count

Data Output Explain Messages Notificatic

	country character varying (50)	count bigint
1	United States	1
2	Czech Republic	1
3	Cambodia	1
4	Germany	1
5	Macedonia	1
6	Mauritius	1
7	Colombia	1
8	Malta	1
9	Spain	1
10	Croatia	1
11	Sudan	1
12	Afghanistan	1
13	Chile	1
14	Gambia	1
15	South Africa	1
16	Nepal	1
17	Kenya	1
18	Denmark	1

19	Morocco	2
20	Portugal	2
21	Finland	2
22	Ukraine	2
23	Azerbaijan	2
24	Democratic Republic of the Congo	2
25	Bulgaria	2
26	Tanzania	2
27	Peru	3
28	Sweden	3
29	Brazil	3
30	Mexico	3
31	France	4
32	Canada	4
33	Philippines	5
34	Russia	6
35	Poland	7
36	Indonesia	12
37	China	16

3) Count artists. Show the youngest and the oldest artists and count their age.

SELECT

```

COUNT(artist_id) count_of_artist,
MIN(date) the_youngest_birth_day,
AGE(NOW(), MIN(date)) age_of_the_youngest,
MAX(date) the_oldest_birth_day,
AGE(NOW(), MAX(date)) age_of_the_oldest

```

FROM

Data Output Explain Messages Notifications

	count_of_artist bigint	the_youngest_birth_day date	age_of_the_youngest interval	the_oldest_birth_day date	age_of_the_oldest interval
1	100	1950-01-15	71 years 10 mons 5 days 12:16:09.853207	2010-11-28	10 years 11 mons 22 days 12:16:09.853207

4) Show artist_id, first_name. Count and show the age of each artist and sort results by style and next by age.

SELECT

```

artist_id,
first_name,

```

DATE_TRUNC('year',(AGE(NOW(), date))) age,

style

FROM artist

GROUP BY artist_id

ORDER BY style, age

Firstly 50 results

Data Output	Explain	Messages	Notifications						
artist_id [PK] integer	first_name character varying (50)	age interval	style character varying (6)						
1	78 Constantine	10 years	pop	26	70 Davon	64 years	pop		
2	34 Merna	11 years	pop	27	85 Hephzibah	66 years	pop		
3	43 Julita	11 years	pop	28	8 Lyda	67 years	pop		
4	21 Easter	12 years	pop	29	11 Colas	69 years	pop		
5	20 Othilie	13 years	pop	30	79 Imogen	69 years	pop		
6	10 Marys	15 years	pop	31	16 Madelle	70 years	pop		
7	65 Juli	21 years	pop	32	80 Marshal	15 years	rap		
8	87 Darby	23 years	pop	33	15 Coral	16 years	rap		
9	69 Adela	24 years	pop	34	50 Royal	17 years	rap		
10	99 Mari	31 years	pop	35	82 Ernaline	17 years	rap		
11	56 Skipper	32 years	pop	36	89 Link	20 years	rap		
12	72 Wash	34 years	pop	37	88 Lizette	20 years	rap		
13	6 Doralin	37 years	pop	38	63 Jule	26 years	rap		
14	98 Joan	38 years	pop	39	19 Red	26 years	rap		
15	66 Hope	42 years	pop	40	40 Raphael	34 years	rap		
16	100 Harp	46 years	pop	41	83 Barty	37 years	rap		
17	59 Theo	49 years	pop	42	12 Barbee	37 years	rap		
18	68 Grantley	49 years	pop	43	64 Jammal	38 years	rap		
19	58 Lon	53 years	pop	44	28 Wallie	48 years	rap		
20	41 Neil	54 years	pop	45	1 Skylar	48 years	rap		
21	45 Annette	55 years	pop	46	57 Barbette	68 years	rap		
22	17 Nonna	58 years	pop	47	24 Welsh	70 years	rap		
23	32 Nicola	59 years	pop	48	74 Mead	12 years	reggae		
24	51 Elly	62 years	pop	49	36 Evin	15 years	reggae		
25	47 Isac	64 years	pop	50	44 Sue	15 years	reggae		

8. Group filtering

- 1) We need to show how many CDs were recorded by each band. Display band_id and CDs for each. Group sorted results by band_id and show only this band_id if the count of CDs is more than 2.

SELECT

band_id,

COUNT(cd_id) all_cds

FROM cd

GROUP BY band_id

HAVING COUNT(cd_id) > 2

ORDER BY band_id

	Data Output	Explain	Messages
	band_id integer	all_cds bigint	
1	22	3	
2	23	3	
3	29	4	
4	41	3	
5	61	3	
6	71	3	
7	79	5	
8	81	3	
9	93	3	

2) Count age of artists born at years 1950-1980

SELECT

artist_id,

date,

DATE_TRUNC('year', AGE(NOW(), date)) age

FROM artist

GROUP BY date, artist_id

HAVING date BETWEEN '1950-01-01' AND '1980-12-31'

ORDER BY date

Data Output		Explain	Messages	Notific
	artist_id [PK] integer 	date date 	age interval 	
1	91	1950-01-15	71 years	
2	55	1950-10-19	71 years	
3	18	1951-04-07	70 years	
4	16	1951-08-08	70 years	
5	24	1951-09-07	70 years	
6	73	1951-11-27	69 years	
7	11	1952-07-14	69 years	
8	79	1952-08-09	69 years	
9	57	1952-12-25	68 years	
10	76	1954-05-14	67 years	
11	9	1954-05-19	67 years	
12	8	1954-09-29	67 years	
13	85	1955-10-07	66 years	
14	49	1956-08-19	65 years	
15	70	1957-01-26	64 years	
16	47	1957-03-30	64 years	
17	33	1958-05-20	63 years	
18	51	1959-01-28	62 years	
19	67	1960-04-13	61 years	
20	93	1961-09-05	60 years	
21	32	1962-02-08	59 years	
22	22	1963-03-03	58 years	

23	17	1963-08-25	58 years
24	39	1963-08-31	58 years
25	46	1964-03-16	57 years
26	4	1964-12-16	56 years
27	45	1966-10-05	55 years
28	41	1967-06-22	54 years
29	58	1968-10-29	53 years
30	5	1968-11-17	53 years
31	90	1971-02-10	50 years
32	60	1971-06-10	50 years
33	59	1972-04-16	49 years
34	68	1972-09-13	49 years
35	2	1972-09-29	49 years
36	1	1973-10-15	48 years
37	28	1973-10-31	48 years
38	42	1974-10-14	47 years
39	100	1975-02-15	46 years
40	94	1977-03-09	44 years
41	13	1978-05-20	43 years
42	84	1978-06-20	43 years
43	97	1978-10-16	43 years
44	66	1979-05-21	42 years
45	95	1979-09-03	42 years