



НАЦІОНАЛЬНИЙ ТЕХНІЧНИЙ УНІВЕРСИТЕТ УКРАЇНИ
«КИЇВСЬКИЙ ПОЛІТЕХНІЧНИЙ ІНСТИТУТ імені Ігоря
Сікорського»

ФАКУЛЬТЕТ ПРИКЛАДНОЇ МАТЕМАТИКИ

**Кафедра системного програмування та спеціалізованих
комп'ютерних систем**

Лабораторна робота 2

з дисципліни
«Бази даних і засоби управління»

Тема: «Проектування бази даних та ознайомлення з
базовими операціями СУБД PostgreSQL»

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ФПМ групи КВ-94

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Загальне завдання роботи полягає у наступному:

1. Реалізувати функції перегляду, внесення, редагування та вилучення даних у таблицях бази даних, створених у лабораторній роботі №1, засобами консольного інтерфейсу.
2. Передбачити автоматичне пакетне генерування «рандомізованих» даних у базі.
3. Забезпечити реалізацію пошуку за декількома атрибутами з двох та більше сутностей одночасно: для числових атрибутів – у рамках діапазону, для рядкових – як шаблон функції LIKE оператора SELECT SQL, для логічного типу – значення True/False, для дат – у рамках діапазону дат.
4. Програмний код виконати згідно шаблону MVC (модель-подання-контролер).

Url -repo: <https://github.com/misha-z1nchuk/databases-class/tree/main/lab2>

Мова програмування та бібліотеки які використовувались: Python, psycopg2, prettytable.

Схема сутність- зв'язок бд

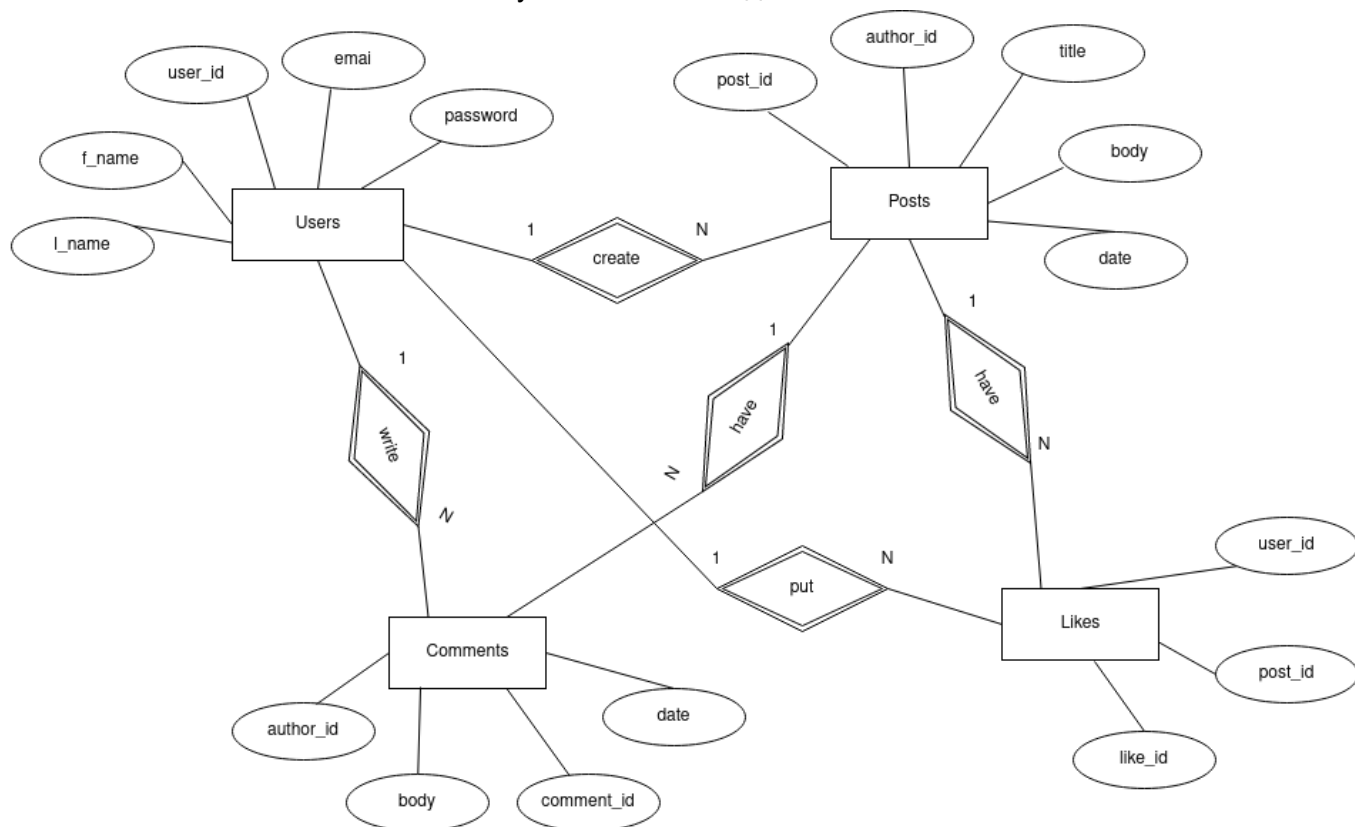
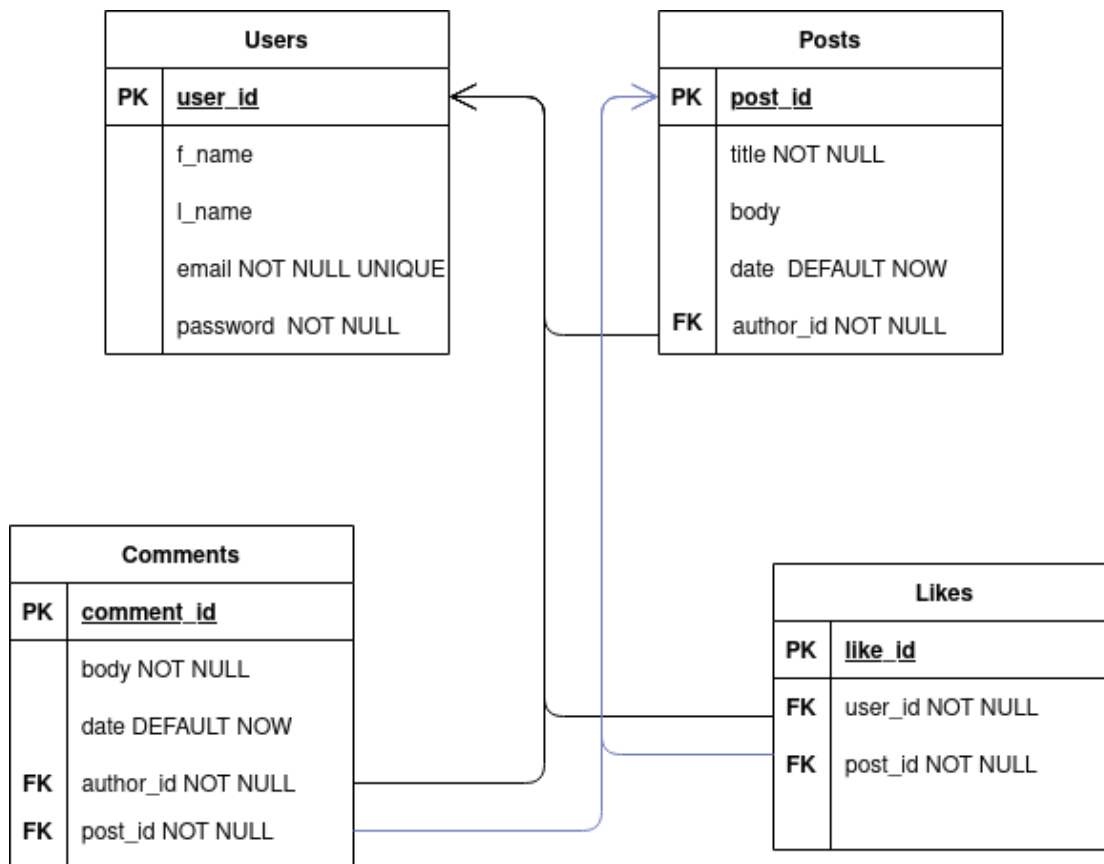


Схема бази даних у графічному вигляді:



Короткий опис бд (Blog)

В даній роботі в нас є три 4 сутності: Users, Posts, Comments, Likes.

Перша сутність *Users* слугує для ведення обліку користувачів блогу, шляхом їх унікальної ідентифікації. Також для визначення даних користувача, таких як ім'я, прізвище, мейл.

Друга сутність *Posts* призначена для ведення обліку дописів, шляхом їх унікальної ідентифікації, та визначення дати допису, тіла допису, заголовку і автора допису.

Третя сутність *Comments* призначена для ведення обліку коментарів, шляхом їх унікальної ідентифікації, та визначення дати, автора, тексту коментаря і до якого посту він належить.

Четверта сутність *Likes* призначена для ведення обліку лайків, шляхом їх унікальної ідентифікації, та визначення поста до якого він відноситься, та юзера який поставив лайк.

Опис меню програми

У меню є 5 пунктів - (to add, to update, to delete, to specific select, to show table)

1 to add : Забезпечує додавання даних до таблиць.

2 to update: Забезпечує редагування даних у таблицях.

3 to delete: Забезпечує видалення даних з таблиць.

4 to specific select: Дозволяє відфільтрувати дані трьома способами.

5 show table: Показує всі дані з конкретної таблиці.

Завдання 1

INSERT

Table: **posts**

```
Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
1
Choose table:
  press 1 - users...  press 2 - posts...  press 3 - likes... press 4 - comments
2
Do you want to insert rows manually or randomly?
Press M if manually, R if randomly: M
How much rows do you wanna add?
1
Enter values following this sequence: title, body, author_id
title: My new laptop
body: Last week I bought a new lap....
author_id: 1
1 Record successfully inserted
Do you want to continue? Press Y if yes, N if no:
```

Лістинг запиту

```
sql_insert_query = """ INSERT INTO posts (title, body, author_id)
VALUES (%s, %s, %s) """
```

Result

```
Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
5
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
3
+-----+-----+-----+-----+-----+
| post_id | title | body | date | author_id |
+-----+-----+-----+-----+
| 1 | dfsf | dsfd | 2021-09-11 14:16:42.811920+03:00 | 1 |
| 2 | New PC | So last week i bought a new PC.... | 2021-09-11 14:17:45.551787+03:00 | 2 |
| 4 | My last job | fsdfsdfsdkfsdkfslfksdfsdfsdfsd | 2021-09-11 14:18:28.289647+03:00 | 3 |
| 5 | Msdkfsdafsd | sfdsadfsdfsdfsdaf | 2021-10-31 16:16:09.707603+02:00 | 1 |
| 6 | fsdf | fsdffsd | 2021-10-31 21:49:22.683802+02:00 | 3 |
| 7 | 7869e2b59c59ce7d88ee205e691c2f44 | 62480010b54f8f2f7b7522a7d430193e | 2021-10-31 23:24:41.961766+02:00 | 2 |
| 8 | f499491fa6658cfd0b239dbb39b16f00 | 699ae7e2693a253ee271ac1f8de00f5e | 2021-10-31 23:24:41.961766+02:00 | 3 |
| 9 | 1a044eda4a44bc7accaedecd4a9990f1 | 53a41b941e30ef2cae9b8457c1ca9371 | 2021-10-31 23:24:41.961766+02:00 | 3 |
| 10 | My new laptop | Last week i bought a new lap.... | 2021-11-06 13:45:05.912538+02:00 | 1 |
+-----+-----+-----+-----+
Do you want to exit? Press M to go to the main menu, or E to exit: |
```

Приклад вводу неіснуючого значення батьківської таблиці.

```
Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
1
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
2
Do you want to insert rows manually or randomly?
Press M if manually, R if randomly: M
How much rows do you wanna add?
1
Enter values following this sequence: title, body, author_id
title: Story
body: last two days..
author_id: 4
Failed inserting record into table insert or update on table "posts" violates foreign key constraint "post_author_id_fkey"
DETAIL: Key (author_id)=(4) is not present in table "users".

Do you want to continue? Press Y if yes, N if no:
```

Table: likes

```
Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
1
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
3
Do you want to insert rows manually or randomly?
Press M if manually, R if randomly: M
How much rows do you wanna add?
1
Enter values following this sequence: user_id, post_id
user_id: 5
post_id: 2
1 Record successfully inserted
Do you want to continue? Press Y if yes, N if no:
```

```
Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
1
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
3
Do you want to insert rows manually or randomly?
Press M if manually, R if randomly: M
How much rows do you wanna add?
1
Enter values following this sequence: user_id, post_id
user_id: 12
post_id: 11
Failed inserting record into table insert or update on table "likes" violates foreign key constraint "likes_user_id_fkey"
DETAIL: Key (user_id)=(12) is not present in table "users".

Do you want to continue? Press Y if yes, N if no: |
```

Лістинг запиту

```
sql_insert_query = """ INSERT INTO likes (user_id, post_id)
VALUES (%s, %s) """
```

Table comments

```
Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
1
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
4
Do you want to insert rows manually or randomly?
Press M if manually, R if randomly: M
How much rows do you wanna add?
1
Enter values following this sequence: body, author_id, post_id
body: Coll story
user_id: 3
post_id: 8
1 Record successfully inserted
Do you want to continue? Press Y if yes, N if no: |
```

Result

```
Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
5
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
4
+-----+-----+-----+-----+-----+
| comment_id |          body          |          date          | author_id | post_id |
+-----+-----+-----+-----+-----+
| 3          | WOW NICE!!!            | 2021-09-11 14:20:28.102412+03:00 | 2        | 4       |
| 4          | Cool                   | 2021-09-11 14:23:10.524370+03:00 | 3        | 2       |
| 5          | Interesting             | 2021-10-31 16:24:14.031236+02:00 | 3        | 2       |
| 6          | 9d68821e82f605b8eee76516ee52d00e | 2021-10-31 23:44:00.020136+02:00 | 1        | 5       |
| 9          | fds                    | 2021-11-06 01:16:30.595917+02:00 | 2        | 1       |
| 10         | fdsfds                 | 2021-11-06 01:16:35.302850+02:00 | 2        | 1       |
| 11         | Coll story             | 2021-11-06 14:37:21.098113+02:00 | 3        | 8       |
+-----+-----+-----+-----+-----+
Do you want to exit? Press M to go to the main menu, or E to exit: |
```

```

Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
1
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
4
Do you want to insert rows manually or randomly?
Press M if manually, R if randomly: M
How much rows do you wanna add?
1
Enter values following this sequence: body, author_id, post_id
body: fdsfds
user_id: 1
post_id: 29
Failed inserting record into table insert or update on table "comments" violates foreign key constraint "comment_post_id_fkey"
DETAIL: Key (post_id)=(29) is not present in table "posts".

Do you want to continue? Press Y if yes, N if no:

```

Лістинг запиту

```

sql_insert_query = """ INSERT INTO comments (body, author_id, post_id)
VALUES (%s, %s, %s) """

```

UPDATE

Table: Users

```

+-----+-----+-----+-----+-----+
| user_id | f_name | l_name | email | password |
+-----+-----+-----+-----+-----+
| 1 | zero | rewrw | fsdfsd | fdsfds |
| 2 | John | Danes | johndanes@gmail.com | qwerty |
| 3 | Derek | Banes | darek@gmail.com | zxcvbn |
| 5 | misha | zenya | zenya@gmail.com2 | 213321 |
| 6 | misha | zdas | 123214sa | vdfsksfdvjds |
| 8 | EBRRIG | HQOLKN | VWBSFT | NTIFWF |
| 9 | HSDUPP | SHKCWL | YKAJJL | HNPSKL |
| 10 | PWTXIV | TBLHNO | GRNXKC | NXLTDU |
| 11 | FFXIBE | BYUINP | IXUVAL | FYLHCX |
+-----+-----+-----+-----+-----+
Do you want to exit? Press M to go to the main menu, or E to exit:

```



```

Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
2
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
1
How much rows do you wanna update?
1
Enter values following this sequence f_name, l_name, email, password:
f_name: Igor
l_name: Vasiluk
email: igor@gmail.com
password: flsdfkwe
User_id :8
1 Records Updated
Do you want to continue? Press Y if yes, N if no: |

```

Result

user_id	f_name	l_name	email	password
1	zero	rewrw	fsdfsd	fdsfds
2	John	Danes	johndanes@gmail.com	qwerty
3	Derek	Banes	darek@gmail.com	zxcvbn
5	misha	zenya	zenya@gmail.com2	213321
6	misha	zdas	123214sa	vdfsksfdvjsd
8	Igor	Vasiluk	igor@gmail.com	flsdfkwe
9	HSDUPP	SHKCWL	YKAJJL	HNPSKL
10	PWTXIV	TBLHNO	GRNXKC	NXLTDU
11	FFXIBE	BYUINP	IXUVAL	FYLHCX

Errors handling

```
Enter values following this sequence f_name, l_name, email, password:
f_name:
Error, column cannot contain NULL value
```

```
Enter values following this sequence f_name, l_name, email, password:
f_name: fdlsfsd
l_name: alish
email: alish@gmail
password: ksfdlfks
User_id :fds
You entered wrong value, please try again!
Do you want to exit? Press M to go to the main menu, or E to exit: |
```

Table: posts

post_id	title	body	date	author_id
1	dfsfs	dsfsd	2021-09-11 14:16:42.811920+03:00	1
2	New PC	So last week i bought a new PC....	2021-09-11 14:17:45.551787+03:00	2
4	My last job	fsdfsdfsdkfsdkfdfsLfksdfsdfsds	2021-09-11 14:18:28.289647+03:00	3
5	Msdkfdsdafsds	sfdsadfsdfsdsdaf	2021-10-31 16:16:09.707603+02:00	1
6	fsdfs	fsdfffsd	2021-10-31 21:49:22.683802+02:00	3
7	7869e2b59c59ce7d88ee205e691c2f44	62480010b54f8f2f7b7522a7d430193e	2021-10-31 23:24:41.961766+02:00	2
8	f499491fa6658cfd0b239dbb39b16f00	699ae7e2693a253ee271ac1f8de00f5e	2021-10-31 23:24:41.961766+02:00	3
9	1a044eda4a44bc7accaedecd4a9990f1	53a41b941e30ef2cae9b8457c1ca9371	2021-10-31 23:24:41.961766+02:00	3
10	My new laptop	Last week i bought a new lap....	2021-11-06 13:45:05.912538+02:00	1

```
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
2
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
2
How much rows do you wanna update?
1
Enter values following this sequence: title, body, author_id
title: Turkey
body: very beaut...
author_id: 5
post_id :7
1 Records Updated
Do you want to continue? Press Y if yes, N if no:
```

post_id	title	body	date	author_id
1	dfsdf	dsfd	2021-09-11 14:16:42.811920+03:00	1
2	New PC	So last week i bought a new PC....	2021-09-11 14:17:45.551787+03:00	2
4	My last job	fsdfsdksdkfsdkfslfksdfsdfsdf	2021-09-11 14:18:28.289647+03:00	3
5	Msdksdfsdfsdf	sfdsadfsdfsdf	2021-10-31 16:16:09.707603+02:00	1
6	fsdf	fsdffsd	2021-10-31 21:49:22.683802+02:00	3
7	Turkey	very beaut...	2021-10-31 23:24:41.961766+02:00	5
8	f499491fa6658cfd0b239dbb39b16f00	699ae7e2693a253ee271ac1f8de00f5e	2021-10-31 23:24:41.961766+02:00	3
9	1a044eda4a44bc7accaedecd4a9990f1	53a41b941e30ef2cae9b8457c1ca9371	2021-10-31 23:24:41.961766+02:00	3
10	My new Laptop	Last week i bought a new lap....	2021-11-06 13:45:05.912538+02:00	1

```

Enter values following this sequence: title, body, author_id
title: Cat
body: my new
author_id: 400
post_id :5
Failed updating record of the table {} insert or update on table "posts" violates foreign key constraint "post_author_id_fkey"
DETAIL:  Key (author_id)=(400) is not present in table "users".

```

Table likes:

```

Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
2
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
3
How much rows do you wanna update?
1
Enter values following this sequence: user_id, post_id
user_id: 3
post_id: 2
like_id :6
1 Records Updated

```

like_id	user_id	post_id	like_id	user_id	post_id
1	5	2	1	5	2
2	1	5	2	1	5
3	1	4	3	1	4
5	2	4	5	2	4
6	2	1	6	3	2
14	2	7	14	2	7
15	2	2	15	2	2
16	5	2	16	5	2

```
Enter values following this sequence: user_id, post_id
user_id: fd
You entered wrong value, please try again!
```

```
Enter values following this sequence: user_id, post_id
user_id: 32
post_id: 5
like_id :
Failed updating record of the table {} insert or update on table "likes" violates foreign key constraint "likes_user_id_fkey"
DETAIL: Key (user_id)=(32) is not present in table "Users".
```

Comments

```
Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
2
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
4
How much rows do you wanna update?
1
Enter values following this sequence: body, author_id, post_id comment_id
body: Mystery box
user_id: 3
post_id: 5
comment_id :6
1 Records Updated
Do you want to continue? Press Y if yes, N if no:
```

comment_id	body	date	author_id	post_id
3	WOW NICE!!!	2021-09-11 14:20:28.102412+03:00	2	4
4	Cool	2021-09-11 14:23:10.524370+03:00	3	2
5	Interesting	2021-10-31 16:24:14.031236+02:00	3	2
6	9d68821e82f605b8eee76516ee52d00e	2021-10-31 23:44:00.020136+02:00	1	5
9	fds	2021-11-06 01:16:30.595917+02:00	2	1
10	fdsfds	2021-11-06 01:16:35.302850+02:00	2	1
11	Coll story	2021-11-06 14:37:21.098113+02:00	3	8

comment_id	body	date	author_id	post_id
3	WOW NICE!!!	2021-09-11 14:20:28.102412+03:00	2	4
4	Cool	2021-09-11 14:23:10.524370+03:00	3	2
5	Interesting	2021-10-31 16:24:14.031236+02:00	3	2
6	Mystery box	2021-10-31 23:44:00.020136+02:00	3	5
9	fds	2021-11-06 01:16:30.595917+02:00	2	1
10	fdsfds	2021-11-06 01:16:35.302850+02:00	2	1
11	Coll story	2021-11-06 14:37:21.098113+02:00	3	8

```
Enter values following this sequence: body, author_id, post_id comment_id
body: index of ..
user_id: 300
post_id: 4
comment_id :1
Failed, there are no records with such id: list index out of range
Do you want to exit? Press M to go to the main menu, or E to exit:
```

```
Enter values following this sequence: body, author_id, post_id comment_id
body: korekr
user_id: e
You entered wrong value, please try again!
Do you want to exit? Press M to go to the main menu, or E to exit:
```

DELETE

Лістинг запитів

```
" DELETE FROM users WHERE user_id = %s""
```

```
" DELETE FROM posts WHERE post_id = %s""
```

```
" DELETE FROM likes WHERE like_id = %s""
```

```
" DELETE FROM comments WHERE comment_id = %s""
```

Table : Users

user_id	f_name	l_name	email	password
1	zero	rewrw	fsdfsd	fdsfds
2	John	Danes	johndanes@gmail.com	qwerty
3	Derek	Banes	darek@gmail.com	zxcvbn
5	misha	zenya	zenya@gmail.com2	213321
6	misha	zdas	123214sa	vdfsksfdvjds
8	Igor	Vasiluk	igor@gmail.coom	flsdfkwe
9	HSDUPP	SHKCWL	YKAJJL	HNPSKL
10	PWTXIV	TBLHNO	GRNXKC	NXLTDU

```
Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
3
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
1
How much rows do you wanna delete?
1
Enter value that marks user_id:10
1 Record deleted
```

user_id	f_name	l_name	email	password
1	zero	rewrw	fsdfsd	fdsfds
2	John	Danes	johndanes@gmail.com	qwerty
3	Derek	Banes	darek@gmail.com	zxcvbn
5	misha	zenya	zenya@gmail.com2	213321
6	misha	zdas	123214sa	vdfsksfdvjds
8	Igor	Vasiluk	igor@gmail.coom	flsdfkwe
9	HSDUPP	SHKCWL	YKAJJL	HNPSKL

Дочірні таблиці:

post_id	title	body	date	author_id
1	dfs	dsf	2021-09-11 14:16:42.811920+03:00	1
2	New PC	So last week i bought a new PC....	2021-09-11 14:17:45.551787+03:00	2
4	My last job	fsdfsfsdkfsdkfdfs\fkdsfsdfs	2021-09-11 14:18:28.289647+03:00	3
5	Msdksdafsd	sfsadsfsdfsdf	2021-10-31 16:16:09.707603+02:00	1
6	fsdf	fsdffsd	2021-10-31 21:49:22.683802+02:00	3
7	Turkey	very beaut...	2021-10-31 23:24:41.961766+02:00	5
8	f499491fa6658cfd0b239dbb39b16f00	699ae7e2693a253ee271ac1f8de00f5e	2021-10-31 23:24:41.961766+02:00	3
9	1a044eda4a44bc7accaedecd4a9990f1	53a41b941e30ef2cae9b8457c1ca9371	2021-10-31 23:24:41.961766+02:00	3
10	My new Laptop	Last week i bought a new lap....	2021-11-06 13:45:05.912538+02:00	1

like_id	user_id	post_id
1	5	2
2	1	5
3	1	4
5	2	4
6	3	2
14	2	7
15	2	2
16	5	2

comment_id	body	date	author_id	post_id
3	WOW NICE!!!	2021-09-11 14:20:28.102412+03:00	2	4
4	Cool	2021-09-11 14:23:10.524370+03:00	3	2
5	Interesting	2021-10-31 16:24:14.031236+02:00	3	2
6	Mystery box	2021-10-31 23:44:00.020136+02:00	3	5
9	fds	2021-11-06 01:16:30.595917+02:00	2	1
10	fsdfs	2021-11-06 01:16:35.302850+02:00	2	1
11	Coll story	2021-11-06 14:37:21.098113+02:00	3	8

Error handling

```

Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
1
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
2
How much rows do you wanna delete?
1
Enter value that marks user_id: 1
Failed deleting record into table update or delete on table "users" violates foreign key constraint "post_author_id_fkey" on table
DETAIL: Key (user_id)=(1) is still referenced from table "posts".

```

Table: Posts

post_id	title	body	date	author_id
1	dfsdf	dsfd	2021-09-11 14:16:42.811920+03:00	1
2	New PC	So last week i bought a new PC....	2021-09-11 14:17:45.551787+03:00	2
4	My last job	fsdfsdfsdkfsdkfslfkfsdfsd	2021-09-11 14:18:28.289647+03:00	3
5	Msdkfsdafsd	sfdsadfsdfsdf	2021-10-31 16:16:09.707603+02:00	1
6	fsdf	fsdffsd	2021-10-31 21:49:22.683802+02:00	3
7	Turkey	very beaut...	2021-10-31 23:24:41.961766+02:00	5
8	f499491fa6658cfd0b239dbb39b16f00	699ae7e2693a253ee271ac1f8de00f5e	2021-10-31 23:24:41.961766+02:00	3
9	1a044eda4a44bc7accaedecd4a9990f1	53a41b941e30ef2cae9b8457c1ca9371	2021-10-31 23:24:41.961766+02:00	3
10	My new laptop	Last week i bought a new lap....	2021-11-06 13:45:05.912538+02:00	1

```
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
3
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
2
How much rows do you wanna delete?
1
Enter value that marks post_id: 10
1 Record deleted
Do you want to continue? Press Y if yes, N if no: |
```

post_id	title	body	date	author_id
1	dfsdf	dsfd	2021-09-11 14:16:42.811920+03:00	1
2	New PC	So last week i bought a new PC....	2021-09-11 14:17:45.551787+03:00	2
4	My last job	fsdfsdfsdkfsdkfslfkfsdfsd	2021-09-11 14:18:28.289647+03:00	3
5	Msdkfsdafsd	sfdsadfsdfsdf	2021-10-31 16:16:09.707603+02:00	1
6	fsdf	fsdffsd	2021-10-31 21:49:22.683802+02:00	3
7	Turkey	very beaut...	2021-10-31 23:24:41.961766+02:00	5
8	f499491fa6658cfd0b239dbb39b16f00	699ae7e2693a253ee271ac1f8de00f5e	2021-10-31 23:24:41.961766+02:00	3
9	1a044eda4a44bc7accaedecd4a9990f1	53a41b941e30ef2cae9b8457c1ca9371	2021-10-31 23:24:41.961766+02:00	3

Дочірні таблиці

comment_id	body	date	author_id	post_id
3	WOW NICE!!!	2021-09-11 14:20:28.102412+03:00	2	4
4	Cool	2021-09-11 14:23:10.524370+03:00	3	2
5	Interesting	2021-10-31 16:24:14.031236+02:00	3	2
6	Mystery box	2021-10-31 23:44:00.020136+02:00	3	5
9	fds	2021-11-06 01:16:30.595917+02:00	2	1
10	fdsfds	2021-11-06 01:16:35.302850+02:00	2	1
11	Coll story	2021-11-06 14:37:21.098113+02:00	3	8

like_id	user_id	post_id
1	5	2
2	1	5
3	1	4
5	2	4
6	3	2
14	2	7
15	2	2
16	5	2

Error handling:

```

Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
1
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
2
How much rows do you wanna delete?
1
Enter value that marks post_id: 8
Failed deleting record into table update or delete on table "posts" violates foreign key constraint "comment_post_id_fkey" o
DETAIL:  Key (post_id)=(8) is still referenced from table "comments".

```

Завдання 2

Table : users

```

Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
1
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
1
Do you want to insert rows manually or randomly?
Press M if manually, R if randomly: R
What number of row do you want to add(type 'd' to set default)? - 100000
100000 Record successfully inserted
Do you want to exit? Press M to go to the main menu, or E to exit: |

```

Date example

	451203		UOVQ		@INBGA		NUVYAALQ		FXNNSXRQAX	
	451204		IIAC		GCTGDS		?RAIUHOT		>PEBYNYVNX	
	451205		ULUL		RBKFTO		UYJVXQXE		PECTUWVYIO	
	451206		UEWS		OYWUXA		00PQJJBR		HCLXAGTFBJ	
	451207		ROAC		NGUPFR		SFASIVXG		JIPEFGSMYQ	
	451208		WKYT		LMTSFB		LWPMDDPF		THECPBWXXW	
	451209		RLKC		CEDKTG		PUMYKSRF		RLJPAPEGFT	
	451210		WAVS		JXSSUL		EUXLCSGO		AMEIYAXTOS	
	451211		KWFU		URCTOM		JRFXSTQB		LQEGCICHTL	
	451212		TMBH		OHLXMC		NIXUVBRA		UFSGOYBKVR	
	451213		TSBK		QRTNIB		BMQFPOKT		BSTRNLSVLT	
	451214		NPNA		SKOVUO		MWFFQQJG		FAHWQHGNPC	

```
blog=# select count(*) from users;
count
-----
100007
```

```
sql_random_query = "" INSERT INTO users (f_name, l_name, email, password)
SELECT
    chr(trunc(65+random()*25)::int) || chr(trunc(65+random()*25)::int) ||
    chr(trunc(65+random()*25)::int) || chr(trunc(65+random()*25)::int),
    chr(trunc(64+random()*25)::int) || chr(trunc(65+random()*25)::int) ||
    chr(trunc(65+random()*25)::int) || chr(trunc(65+random()*25)::int) ||
    chr(trunc(65+random()*25)::int) || chr(trunc(65+random()*25)::int),
    chr(trunc(63+random()*25)::int) || chr(trunc(65+random()*25)::int) ||
    chr(trunc(65+random()*25)::int) || chr(trunc(65+random()*25)::int) ||
    chr(trunc(65+random()*25)::int) || chr(trunc(64+random()*25)::int) ||
    chr(trunc(65+random()*25)::int) || chr(trunc(65+random()*25)::int),
    chr(trunc(62+random()*25)::int) || chr(trunc(65+random()*25)::int) ||
    chr(trunc(65+random()*25)::int) || chr(trunc(65+random()*25)::int) ||
    chr(trunc(65+random()*25)::int) || chr(trunc(65+random()*25)::int) ||
    chr(trunc(65+random()*25)::int) || chr(trunc(65+random()*25)::int) ||
    chr(trunc(65+random()*25)::int) || chr(trunc(65+random()*25)::int)
FROM
    generate_series(1, %s)
```

Posts

```

Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
1
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
2
Do you want to insert rows manually or randomly?
Press M if manually, R if randomly: R
What number of row do you want to add(type 'd' to set default)? - 100000
100000 Record successfully inserted
Do you want to exit? Press M to go to the main menu, or E to exit: |

```

Data example

	post_id [PK] integer	title character varying (128)	body text	date timestamp with time zone	author_id integer
14	80018	27772185559f6f060cf81e79609039ec	d6d0afd2b5c47e608008ca1fe83093ef	2021-11-06 18:16:03.801386+02	3
15	80019	27772185559f6f060cf81e79609039ec	d6d0afd2b5c47e608008ca1fe83093ef	2021-11-06 18:16:03.801386+02	3
16	80020	27772185559f6f060cf81e79609039ec	d6d0afd2b5c47e608008ca1fe83093ef	2021-11-06 18:16:03.801386+02	3
17	80021	27772185559f6f060cf81e79609039ec	d6d0afd2b5c47e608008ca1fe83093ef	2021-11-06 18:16:03.801386+02	3
18	80022	27772185559f6f060cf81e79609039ec	d6d0afd2b5c47e608008ca1fe83093ef	2021-11-06 18:16:03.801386+02	3
19	80023	27772185559f6f060cf81e79609039ec	d6d0afd2b5c47e608008ca1fe83093ef	2021-11-06 18:16:03.801386+02	3
20	80024	27772185559f6f060cf81e79609039ec	d6d0afd2b5c47e608008ca1fe83093ef	2021-11-06 18:16:03.801386+02	3
21	80025	27772185559f6f060cf81e79609039ec	d6d0afd2b5c47e608008ca1fe83093ef	2021-11-06 18:16:03.801386+02	3
22	80026	27772185559f6f060cf81e79609039ec	d6d0afd2b5c47e608008ca1fe83093ef	2021-11-06 18:16:03.801386+02	3
23	80027	27772185559f6f060cf81e79609039ec	d6d0afd2b5c47e608008ca1fe83093ef	2021-11-06 18:16:03.801386+02	3
24	80028	27772185559f6f060cf81e79609039ec	d6d0afd2b5c47e608008ca1fe83093ef	2021-11-06 18:16:03.801386+02	3
25	80029	27772185559f6f060cf81e79609039ec	d6d0afd2b5c47e608008ca1fe83093ef	2021-11-06 18:16:03.801386+02	3
26	80030	27772185559f6f060cf81e79609039ec	d6d0afd2b5c47e608008ca1fe83093ef	2021-11-06 18:16:03.801386+02	3
27	80031	27772185559f6f060cf81e79609039ec	d6d0afd2b5c47e608008ca1fe83093ef	2021-11-06 18:16:03.801386+02	3

```

blog=# select count(*) from posts;
count
-----
100008
(1 рядок)

```

```

sql_random_query = "" INSERT INTO posts (title, body, author_id)
SELECT ttl, bdy, author_id FROM
(SELECT md5((random()*1)::text) as ttl,
        md5((random()*2)::text) as bdy,
        author_id
FROM posts tablesample BERNOULLI(100)
ORDER BY random()) k, generate_series(1, 100000) LIMIT %s
"" ""

```

Table: Likes

```
Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
}
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
}
Do you want to insert rows manually or randomly?
Press M if manually, R if randomly: R
What number of row do you want to add(type 'd' to set default)? - 100000
100000 Record successfully inserted
Do you want to exit? Press M to go to the main menu, or E to exit:
```

	like_id [PK] integer	user_id integer	post_id integer
24	1037	9	9
25	1038	1	2
26	1039	2	9
27	1040	2	1
28	1041	5	6
29	1042	6	2
30	1043	1	5
31	1044	1	7
32	1045	1	4
33	1046	5	8
34	1047	8	4
35	1048	8	8
36	1049	6	1
37	1050	3	6
38	1051	9	2

```
blog=# select count(*) from likes
blog-# ;
count
-----
100005
(1 рядок)
```






```
sql_random_query = """ INSERT INTO likes (user_id, post_id)
                        SELECT user_id, post_id FROM
                        (SELECT
                        user_id, post_id
                        FROM users, posts tablesample BERNOULLI(100)
                        ORDER BY random()) k ,generate_series(1, 100000) LIMIT %s
                        """
```

Table Comments

```

Choose option:
PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...
1
Choose table:
press 1 - users... press 2 - posts... press 3 - likes... press 4 - comments
4
Do you want to insert rows manually or randomly?
Press M if manually, R if randomly: R
What number of row do you want to add(type 'd' to set default)? - 100000
100000 Record successfully inserted
Do you want to exit? Press M to go to the main menu, or E to exit: |

```

					
	comment_id [PK] integer	body text	date timestamp with time zone	author_id integer	post_id integer
18	24	a58eab8c609b2b1ba7982dd1072f9acd	2021-11-06 18:38:56.74118+02	5	7
19	25	61bb909b40b65ac1cd03c9d1bea41ef6	2021-11-06 18:38:56.74118+02	8	4
20	26	d004f8b6902db670dba8670815583eeb	2021-11-06 18:38:56.74118+02	2	6
21	27	b8059acb000617c7b85915e42acd01d8	2021-11-06 18:38:56.74118+02	5	5
22	28	a0a3159404fdb96fdf6ca18e8c82d021	2021-11-06 18:38:56.74118+02	8	7
23	29	5b2262f369060dde4a83f7eaebf3db5f	2021-11-06 18:38:56.74118+02	9	5
24	30	f24deb771fd89cfee3f9448b167ec637	2021-11-06 18:38:56.74118+02	1	7
25	31	487b90160e0dc410adf8e6dc9b8f4e72	2021-11-06 18:38:56.74118+02	5	8
26	32	b3b927acc2eaa2f9b8493f8c2e42684f	2021-11-06 18:38:56.74118+02	6	7
27	33	dac26c9db29a06871e8136e3a9a24cd2	2021-11-06 18:38:56.74118+02	6	5
28	34	f86ecc90c9f05e062ab1bbc29cd8202f	2021-11-06 18:38:56.74118+02	2	8
29	35	16023df6fc554d75141f405a53c9a322	2021-11-06 18:38:56.74118+02	6	6
30	36	837aa91fcbe264d2ec0b830655f10cb0	2021-11-06 18:38:56.74118+02	3	1
31	37	ef264bb69d8c65e91aded1eb82b985b2	2021-11-06 18:38:56.74118+02	3	5
32	38	b6d540a6adebhd37ad09a37d3f8e045e	2021-11-06 18:38:56.74118+02	2	1

```

blog=# select count(*) from comments;
count
-----
100007
(1 рядок)

```

```

sql_random_query = """ INSERT INTO comments (body, author_id, post_id)
SELECT body, user_id, post_id FROM
    (SELECT md5((random()*1)::text) as body,
    user_id, post_id
    FROM users, posts tablesample BERNOULLI(100)
    ORDER BY random()) k ,generate_series(1, 100000) LIMIT %s
"""

```

Завдання 3

```
if table_num == '1':
    sql_specific_query = """select title, body, author_id from (select p.title, p.body, p.author_id, count(likes.like_id)
as likes_amount from posts p left join likes on likes.post_id=p.post_id
where p.date > %s AND p.author_id=%s group by p.title, p.body, p.author_id)
AS foo where likes_amount > %s;
```

```
' select * from (select p.title, c.body, c.date from comments c
left join posts p on c.post_id = p.post_id where c.author_id = %s) AS foo
WHERE title LIKE %s AND date > %s;"""
```

```
sql_specific_query = """select uid, fn, em from (select user_id as uid, f_name as fn, email as em, count(title)
from (select * from (select foo.user_id, foo.f_name, foo.email, count(c.body), foo.title, foo.date
from (select u.user_id, u.f_name, u.email, p.title, p.date, p.post_id
from users u inner join posts p on p.author_id = u.user_id) as foo
left join comments c on c.post_id = foo.post_id group by user_id, foo.f_name, foo.email, foo.title, foo.date) As foo3
where count > %s AND foo3.date between %s and %s) as foo4 group by user_id, f_name, email) as foo5 where count > %s;
"""
```

Choose option:

PRESS: 1 to add... 2 to update... 3 to delete... 4 to specific_select... 5 to show_table...

4

- 1) Show title, body, author_id of posts created by certain 'user',
where amount of likes is greater than 'value' and date of post is later than
that 'date'.
- 2) Show body, date of comments that were wrote by certain 'user',
under certain post with 'specific title', and date of comment is later than that 'date'
- 3) Show user_id, f_name, email, of user that has more than "value" posts
and which were created between 'date1 and 'date2',
and amount of comments is greater then 'value'

Choose table:

Press: 1 or 2 or 3

1.:

Choose option:

Press: 1 or 2 or 3

1

Enter values following this sequence user_id, amount, date:

user_id: 2

amount : 1

date: 2021-09-10

Time of request 2 ms

```
+-----+-----+-----+-----+
| title |          body          | author_id |
+-----+-----+-----+-----+
| New PC | So last week i bought a new PC.... |      2    |
+-----+-----+-----+-----+
```

```
select title, body, author_id from (select p.title, p.body, p.author_id, count(likes.like_id)
as likes_amount from posts p left join likes on likes.post_id=p.post_id
where p.date > '2021-09-10' AND p.author_id=2 group by p.title, p.body, p.author_id)
AS foo where likes_amount > 1
```

Data Output Explain Messages Notifications

	title character varying (128)	body text	author_id integer
1	New PC	So last week i bought a new PC....	2

EXPLAIN ANALYZE

```
select title, body, author_id from (select p.title, p.body, p.author_id, count(likes.like_id)
as likes_amount from posts p left join likes on likes.post_id=p.post_id
where p.date > '2021-09-10' AND p.author_id=2 group by p.title, p.body, p.author_id)
AS foo where likes_amount > 1
```

	QUERY PLAN
	text
3	[...] Group Key: p.title, p.body, p.author_id
4	[...] Filter: (count(likes.like_id) > 1)
5	[...] -> Sort (cost=2.22..2.22 rows=1 width=43) (actual time=0.048..0.100 rows=2 loops=1)
6	[...] Sort Key: p.title, p.body
7	[...] Sort Method: quicksort Memory: 25kB
8	[...] -> Hash Right Join (cost=1.13..2.21 rows=1 width=43) (actual time=0.031..0.087 rows=2 loops=1)
9	[...] Hash Cond: (likes.post_id = p.post_id)
10	[...] -> Seq Scan on likes (cost=0.00..1.05 rows=5 width=8) (actual time=0.004..0.005 rows=5 loops=1)
11	[...] -> Hash (cost=1.12..1.12 rows=1 width=43) (actual time=0.018..0.019 rows=1 loops=1)
12	[...] Buckets: 1024 Batches: 1 Memory Usage: 9kB
13	[...] -> Seq Scan on posts p (cost=0.00..1.12 rows=1 width=43) (actual time=0.012..0.015 rows=1 loops=1)
14	[...] Filter: ((date > '2021-09-10 00:00:00+03':timestamp with time zone) AND (author_id = 2))
15	[...] Rows Removed by Filter: 7
16	Planning Time: 0.213 ms
17	Execution Time: 0.153 ms

Enter values following this sequence user_id, amount, date:

user_id: 3

amount: -1

date: 2021-09-10

Time of request 7 ms

title	body	author_id
f499491fa6658cfd0b239dbb39b16f00	699ae7e2693a253ee271ac1f8de00f5e	3
My last job	fsdfsdfsdksdkfksdflksdfsdfsdfsd	3
1a044eda4a44bc7accaedecd4a9990f1	53a41b941e30ef2cae9b8457c1ca9371	3
fsdf	fsdffsd	3

```
select title, body, author_id from (select p.title, p.body, p.author_id, count(likes.like_id)
as likes_amount from posts p left join likes on likes.post_id=p.post_id
where p.date > '2021-09-10' AND p.author_id=3 group by p.title, p.body, p.author_id)
AS foo where likes_amount > -1
```

	title	body	author_id
	character varying (128)	text	integer
1	f499491fa6658cfd0b239dbb39b16f00	699ae7e2693a253ee271ac1f8de00f5e	3
2	My last job	fsdfsdfsdksdkfksdflksdfsdfsdfsd	3
3	1a044eda4a44bc7accaedecd4a9990f1	53a41b941e30ef2cae9b8457c1ca9371	3
4	fsdf	fsdffsd	3

EXPLAIN ANALYZE

```
select title, body, author_id from (select p.title, p.body, p.author_id, count(likes.like_id)
as likes_amount from posts p left join likes on likes.post_id=p.post_id
where p.date > '2021-09-10' AND p.author_id=3 group by p.title, p.body, p.author_id)
AS foo where likes_amount > -1
```

Data Output Explain Messages Notifications

	QUERY PLAN	
1	Subquery Scan on foo (cost=2.28..2.34 rows=1 width=39) (actual time=0.034..0.036 rows=4 loops=1)	
2	[...] -> HashAggregate (cost=2.28..2.33 rows=1 width=47) (actual time=0.053..0.056 rows=4 loops=1)	
3	[...] Group Key: p.title, p.body, p.author_id	
4	[...] Filter: (count(likes.like_id) > '-1'::integer)	
5	[...] Batches: 1 Memory Usage: 24kB	
6	[...] -> Hash Right Join (cost=1.17..2.24 rows=4 width=43) (actual time=0.031..0.040 rows=5 loops=1)	
7	[...] Hash Cond: (likes.post_id = p.post_id)	
8	[...] -> Seq Scan on likes (cost=0.00..1.05 rows=5 width=8) (actual time=0.004..0.005 rows=5 loops=1)	
9	[...] -> Hash (cost=1.12..1.12 rows=4 width=43) (actual time=0.019..0.020 rows=4 loops=1)	
10	[...] Buckets: 1024 Batches: 1 Memory Usage: 9kB	
11	[...] -> Seq Scan on posts p (cost=0.00..1.12 rows=4 width=43) (actual time=0.012..0.014 rows=4 loops=1)	
12	[...] Filter: ((date > '2021-09-10 00:00:00+03'::timestamp with time zone) AND (author_id = 3))	
13	[...] Rows Removed by Filter: 4	
14	Planning Time: 0.329 ms	
15	Execution Time: 0.119 ms	

2

Choose option:

Press: 1 or 2 or 3

2

Enter values following this sequence user_id, specific_title, date:

user_id: 2

specific_title : New PC

date: 2021-07-10

Time of request 4 ms

```
+-----+-----+-----+
| title | body | date |
+-----+-----+-----+
| New PC | Cool | 2021-09-11 14:23:10.524370+03:00 |
| New PC | Interesting | 2021-10-31 16:24:14.031236+02:00 |
+-----+-----+-----+
```

Do you want to exit? Press M to go to the main menu, or E to exit:

```

1 select * from (select p.title, c.body, c.date from comments c
2               left join posts p on c.post_id = p.post_id where p.author_id = 2) AS foo
3               WHERE title LIKE 'New PC' AND date > '2021-07-10';

```

Data Output Explain Messages Notifications

	title character varying (128)	body text	date timestamp with time zone
1	New PC	Cool	2021-09-11 14:23:10.52437+03
2	New PC	Interesting	2021-10-31 16:24:14.031236+02

EXPLAIN ANALYZE

```

select * from (select p.title, c.body, c.date from comments c
               left join posts p on c.post_id = p.post_id where p.author_id = 2) AS foo
               WHERE title LIKE 'New PC' AND date > '2021-07-10';

```

Data Output Explain Messages Notifications

	QUERY PLAN text
1	Nested Loop (cost=0.00..1033.30 rows=1 width=31) (actual time=0.023..1.169 rows=2 loops=1)
2	[...] Join Filter: (c.post_id = p.post_id)
3	[...] Rows Removed by Join Filter: 5
4	[...] -> Seq Scan on posts p (cost=0.00..1.12 rows=1 width=18) (actual time=0.015..0.028 rows=1 loops=1)
5	[...] Filter: (((title)::text ~~ 'New PC'::text) AND (author_id = 2))
6	[...] Rows Removed by Filter: 7
7	[...] -> Seq Scan on comments c (cost=0.00..1032.09 rows=7 width=21) (actual time=0.005..1.135 rows=7 loops=1)
8	[...] Filter: (date > '2021-07-10 00:00:00+03'::timestamp with time zone)
9	Planning Time: 0.320 ms
10	Execution Time: 1.208 ms

Choose option:

Press: 1 or 2 or 3

2

Enter values following this sequence user_id, specific_title, date:

user_id: 6

specific_title : My last job

date: 2020-10-11

Time of request 3 ms

```

+-----+-----+-----+
| title | body | date |
+-----+-----+-----+
| My last job | Nice story | 2021-11-07 12:02:23.134112+02:00 |
| My last job | What is your plans for future? | 2021-11-07 12:02:43.693888+02:00 |
+-----+-----+-----+

```

```

1 select * from (select p.title, c.body, c.date from comments c
2               left join posts p on c.post_id = p.post_id where c.author_id = 5) AS foo
3               WHERE title LIKE 'My last job' AND date > '2021-10-11';

```

Data Output Explain Messages Notifications

	title character varying (128)	body text	date timestamp with time zone
1	My last job	Nice story	2021-11-07 12:02:23.134112+02
2	My last job	What is your plans for future?	2021-11-07 12:02:43.693888+02

Data Output Explain Messages Notifications

	QUERY PLAN text
1	Nested Loop (cost=0.00..1033.22 rows=1 width=31) (actual time=0.016..0.906 rows=2 loops=1)
2	[...] Join Filter: (c.post_id = p.post_id)
3	[...] -> Seq Scan on comments c (cost=0.00..1032.11 rows=1 width=21) (actual time=0.009..0.892 rows=2 loops=1)
4	[...] Filter: ((date > '2021-10-11 00:00:00+03'::timestamp with time zone) AND (author_id = 5))
5	[...] Rows Removed by Filter: 7
6	[...] -> Seq Scan on posts p (cost=0.00..1.10 rows=1 width=18) (actual time=0.003..0.003 rows=1 loops=2)
7	[...] Filter: ((title)::text ~~ 'My last job'::text)
8	[...] Rows Removed by Filter: 1
9	Planning Time: 0.228 ms
10	Execution Time: 0.954 ms

3

Choose option:

Press: 1 or 2 or 3

3

Enter values following this sequence post_value, date1, date2, comment_value

post_value: 1

date1: 2019-10-11

date2: 2021-11-10


comment_value: 0

Time of request 4 ms

```

+-----+-----+-----+
| user_id | f_name | email |
+-----+-----+-----+
| 1 | zero | fsdfsd |
| 2 | John | johndanes@gmail.com |
| 3 | Derek | darek@gmail.com |
+-----+-----+-----+

```


blog/postgres@LocalPG

Query Editor

Query History

```

1 select uid, fn, em from (select user_id as uid, f_name as fn, email as em, count(title)
2     from (select * from (select foo.user_id, foo.f_name, foo.email, count(c.body), foo.title, foo.date
3     from (select u.user_id, u.f_name, u.email, p.title, p.date, p.post_id
4     from users u inner join posts p on p.author_id = u.user_id) as foo
5     left join comments c on c.post_id = foo.post_id group by user_id, foo.f_name, foo.email, foo.title, foo.date) As foo3
6     where count > 1 AND foo3.date between '2019-10-11' and '2021-11-10') as foo4 group by user_id, f_name, email) as foo5 where count

```

Data Output

Explain

Messages

Notifications

	uid integer	fn character varying (30)	em character varying (128)
1	1	zero	fsdfsd
2	2	John	johndanes@gmail.com
3	3	Derek	darek@gmail.com

	Data Output	Explain	Messages	Notifications
	QUERY PLAN text			
19	[...] Join Filter: (c.post_id = p.post_id)			
20	[...] Rows Removed by Join Filter: 63			
21	[...] -> Merge Join (cost=3.41..3.55 rows=8 width=48) (actual time=0.027..0.034 rows=8 loops=1)			
22	[...] Merge Cond: (u.user_id = p.author_id)			
23	[...] -> Sort (cost=2.17..2.19 rows=7 width=22) (actual time=0.013..0.014 rows=5 loops=1)			
24	[...] Sort Key: u.user_id			
25	[...] Sort Method: quicksort Memory: 25kB			
26	[...] -> Seq Scan on users u (cost=0.00..2.07 rows=7 width=22) (actual time=0.006..0.008 rows=7 loops=1)			
27	[...] -> Sort (cost=1.24..1.26 rows=8 width=30) (actual time=0.008..0.010 rows=8 loops=1)			
28	[...] Sort Key: p.author_id			
29	[...] Sort Method: quicksort Memory: 25kB			
30	[...] -> Seq Scan on posts p (cost=0.00..1.12 rows=8 width=30) (actual time=0.004..0.005 rows=8 loops=1)			
31	[...] Filter: ((date >= '2019-10-11 00:00:00+03':timestamp with time zone) AND (date <= '2021-11-10 00:00:00+02':timestamp with time zone))			
32	[...] -> Materialize (cost=0.00..1032.11 rows=7 width=13) (actual time=0.001..0.071 rows=9 loops=8)			
33	[...] -> Seq Scan on comments c (cost=0.00..1032.07 rows=7 width=13) (actual time=0.004..0.556 rows=9 loops=1)			

Choose option:

Press: 1 or 2 or 3

3

Enter values following this sequence post_value, date1, date2, comment_value

post_value: 0

date1: 2010-02-22

date2: 2022-01-20

comment_value: 1

Time of request 5 ms

```

+-----+-----+-----+
| user_id | f_name | email |
+-----+-----+-----+
| 1 | zero | fsdfs |
| 3 | Derek | darek@gmail.com |
+-----+-----+-----+

```


	Query Editor	Query History
1	select uid, fn, em from (select user_id as uid, f_name as fn, email as em, count(title)	
2	from (select * from (select foo.user_id, foo.f_name, foo.email, count(c.body), foo.title, foo.date	
3	from (select u.user_id, u.f_name, u.email, p.title, p.date, p.post_id	
4	from users u inner join posts p on p.author_id = u.user_id) as foo	
5	left join comments c on c.post_id = foo.post_id group by user_id, foo.f_name, foo.email, foo.title, foo.date) as foo3	
6	where count > 0 AND foo3.date between '2010-02-22' and '2022-01-20') as foo4 group by user_id, f_name, email) as foo5 where count > 1;	

	Data Output	Explain	Messages	Notifications
	<div>uid</div> <div>integer</div> <div></div>	<div>fn</div> <div>character varying (30)</div> <div></div>	<div>em</div> <div>character varying (128)</div> <div></div>	
1	1	zero	fsdfs	
2	3	Derek	darek@gmail.com	

EXPLAIN ANALYZE

```
select uid, fn, em from (select user_id as uid, f_name as fn, email as em, count(title)
from (select * from (select foo.user_id, foo.f_name, foo.email, count(c.body), foo.title, foo.date
from (select u.user_id, u.f_name, u.email, p.title, p.date, p.post_id
from users u inner join posts p on p.author_id = u.user_id) as foo
left join comments c on c.post_id = foo.post_id group by user_id, foo.f_name, foo.email, foo.title, foo.date) As foo3
where count > 0 AND foo3.date between '2010-02-22' and '2022-01-20') as foo4 group by user_id, f_name, email) as foo5 where count > 1;
```

[Data Output](#) [Explain](#) [Messages](#) [Notifications](#)

	QUERY PLAN	
	text	
1	Subquery Scan on foo5 (cost=520.13..1037.18 rows=1 width=22) (actual time=1.083..1.088 rows=2 loops=1)	
2	[...] -> GroupAggregate (cost=520.13..1037.17 rows=1 width=30) (actual time=1.082..1.086 rows=2 loops=1)	
3	[...] Group Key: foo3.user_id, foo3.f_name, foo3.email	
4	[...] Filter: (count(foo3.title) > 1)	
5	[...] Rows Removed by Filter: 1	
6	[...] -> Incremental Sort (cost=520.13..1037.11 rows=3 width=36) (actual time=1.076..1.079 rows=5 loops=1)	
7	[...] Sort Key: foo3.user_id, foo3.f_name, foo3.email	
8	[...] Presorted Key: foo3.user_id	
9	[...] Full-sort Groups: 1 Sort Method: quicksort Average Memory: 25kB Peak Memory: 25kB	
10	[...] -> Subquery Scan on foo3 (cost=261.70..1036.97 rows=3 width=36) (actual time=1.058..1.070 rows=5 loops=1)	
11	[...] -> GroupAggregate (cost=261.70..1036.94 rows=3 width=52) (actual time=1.057..1.068 rows=5 loops=1)	
12	[...] Group Key: u.user_id, p.title, p.date	
13	[...] Filter: (count(c.body) > 0)	
14	[...] Rows Removed by Filter: 3	
15	[...] -> Incremental Sort (cost=261.70..1036.76 rows=8 width=53) (actual time=1.047..1.050 rows=12 loops=1)	
20	[...] Join Filter: (c.post_id = p.post_id)	
21	[...] Rows Removed by Join Filter: 63	
22	[...] -> Merge Join (cost=3.41..3.55 rows=8 width=48) (actual time=0.036..0.047 rows=8 loops=1)	
23	[...] Merge Cond: (u.user_id = p.author_id)	
24	[...] -> Sort (cost=2.17..2.19 rows=7 width=22) (actual time=0.021..0.022 rows=5 loops=1)	
25	[...] Sort Key: u.user_id	
26	[...] Sort Method: quicksort Memory: 25kB	
27	[...] -> Seq Scan on users u (cost=0.00..2.07 rows=7 width=22) (actual time=0.011..0.015 rows=7 loops=1)	
28	[...] -> Sort (cost=1.24..1.26 rows=8 width=30) (actual time=0.011..0.013 rows=8 loops=1)	
29	[...] Sort Key: p.author_id	
30	[...] Sort Method: quicksort Memory: 25kB	
31	[...] -> Seq Scan on posts p (cost=0.00..1.12 rows=8 width=30) (actual time=0.005..0.007 rows=8 loops=1)	
32	[...] Filter: ((date >= '2010-02-22 00:00:00+02':timestamp with time zone) AND (date <= '2022-01-20 00:00:00+02':timestamp with time zone))	
33	[...] -> Materialize (cost=0.00..1032.11 rows=7 width=13) (actual time=0.001..0.121 rows=9 loops=8)	
34	[...] -> Seq Scan on comments c (cost=0.00..1032.07 rows=7 width=13) (actual time=0.004..0.961 rows=9 loops=1)	

Завдання 4

```
import time
from middleware.sqlmiddle import origin_type
import psycopg2

class Model:
    def __init__(self):
        try:
            self.connection = psycopg2.connect(
                user="postgres",
                password="root",
                host="localhost",
                port=5432,
                database="blog",
            )
            self.cursor = self.connection.cursor()
        except:
            print('Error connection to db')

    def add_table(self, records, sql_insert_query):
        try:
            cursor = self.connection.cursor()
            cursor.executemany(sql_insert_query, records)
            self.connection.commit()
            print(cursor.rowcount, "Record successfully inserted")
        except (Exception, psycopg2.Error) as error:
            print("Failed inserting record into table {}".format(error))
            self.connection.rollback()
        finally:
            if self.connection:
                cursor.close()
```

```

def only_possible(self, val, num, err_func):
    try:
        rec = [(val,)]
        sql_origin = self.origin_type(num)
        curs = self.connection.cursor()
        curs.execute(sql_origin, rec)
        records = curs.fetchall()
        if records[0] is None:
            for row in records:
                print("There is row with id: ", row[0])
    except (Exception, psycopg2.Error) as error:
        print("Failed, there are no records with such id: {}".format(error))
        err_func()
    finally:
        if self.connection:
            curs.close()

def update_table(self, records, sql_update_query):
    try:
        cursor = self.connection.cursor()
        cursor.executemany(sql_update_query, records)
        self.connection.commit()
        row_count = cursor.rowcount
        print(row_count, "Records Updated")
    except (Exception, psycopg2.Error) as error:
        print("Failed updating record of the table {}", error)
        self.connection.rollback()
    finally:
        if self.connection:
            cursor.close()

```



```

def del_table(self, records, sql_delete_query):
    try:
        cursor = self.connection.cursor()
        cursor.executemany(sql_delete_query, records)
        self.connection.commit()
        print(cursor.rowcount, "Record deleted")
    except (Exception, psycopg2.Error) as error:
        print("Failed deleting record into table {}".format(error))
        self.connection.rollback()
    finally:
        if self.connection:
            cursor.close()

def show_table(self, sql_select_query, tab, record, bool):
    try:
        self.cursor = self.connection.cursor()
        if bool:
            beg = int(time.time() * 1000)
            self.cursor.execute(sql_select_query, record)
            if bool:
                end = int(time.time() * 1000) - beg
                print("Time of request", end, " ms")
            records = self.cursor.fetchall()
            #print_table(records, tab)
        except (Exception, psycopg2.Error) as error:
            print("Error while fetching data from PostgreSQL", error)
            self.connection.rollback()
        finally:
            if self.connection:
                self.cursor.close()
            return records

```

Короткий опис функцій

1. Сам клас Model має конструктор, тобто при створенні об'єкту даного класу, відбувається з'єднання з базою даних.
2. add_table застосовується для операції додавання значень до бд.
- 3 only_possible функція яка перевіряє чи є у бд у конкретній таблиці, об'єкт з даним id.
4. update_table дозволяє редагувати значення з бд.

5. `del_table` дозволяє видалити з бд дані.

6. `show_table` - дозволяє виконати запити `select` до бд, і повертає значення які були отримані після запиту. При цьому вимірює час запиту.