Министерство науки и высшего образования Российской Федерации

федеральное государственное автономное образовательное учреждение высшего образования

«НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ ИТМО»

Отчет

по лабораторной работе №5 «Процедуры, функции, триггеры в PostgreSQL» по дисциплине «Проектирование и реализация баз данных»

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Цель работы: овладеть практическими создания и использования процедур, функций и триггеров в базе данных PostgreSQL.

Оборудование: компьютерный класс.

Программное обеспечение: СУБД PostgreSQL, SQL Shell (psql).

Практическое задание:

Вариант 2 (тах - 8 баллов)

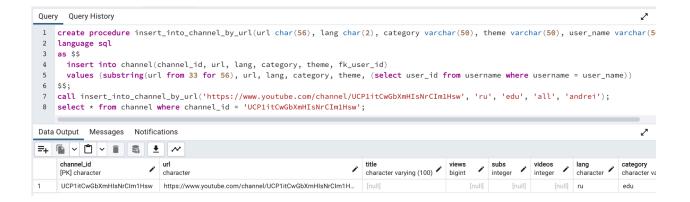
- 1. Создать процедуры/функции.
- 2. Создать авторский триггер.

Выполнение

Создание хранимых процедур:

Процедура добавления канала с преобразованием url в id канала

```
create procedure insert_into_channel_by_url(url char(56), lang
char(2), category varchar(50), theme varchar(50), user_name
varchar(50))
language sql
as $$
  insert into channel(channel_id, url, lang, category, theme,
  fk_user_id)
  values (substring(url from 33 for 56), url, lang, category,
  theme, (select user_id from username where username =
  user_name))
$$
;
call
insert_into_channel_by_url('https://www.youtube.com/channel/UCP1
itCwGbXmHIsNrCImlHsw', 'ru', 'edu', 'all', 'andrei');
select * from channel where channel_id =
  'UCP1itCwGbXmHIsNrCImlHsw';
```



Процедура добавления канала с преобразованием id канала в url

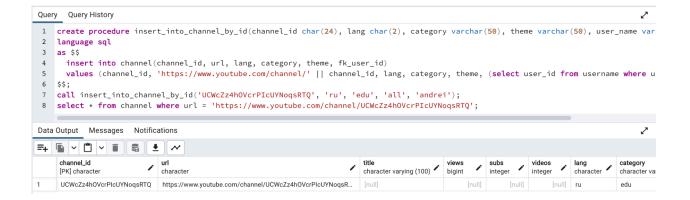
```
create procedure insert_into_channel_by_id(channel_id char(24),
lang char(2), category varchar(50), theme varchar(50), user_name
varchar(50))
language sql
as $$
  insert into channel(channel_id, url, lang, category, theme,
  fk_user_id)

values (channel_id, 'https://www.youtube.com/channel/' ||
channel_id, lang, category, theme, (select user_id from username
where username = user_name))

$$$

call insert_into_channel_by_id('UCWcZz4hOVcrPIcUYNoqsRTQ', 'ru',
  'edu', 'all', 'andrei');

select * from channel where url =
  'https://www.youtube.com/channel/UCWcZz4hOVcrPIcUYNoqsRTQ';
```



Процедура добавления канала с преобразованием url в id канала, а id канала в url

```
create procedure insert into channel(channel id or url
varchar(56), lang char(2), category varchar(50), theme
varchar(50), user name varchar(50))
language plpgsql
as $$ begin
if length(channel id or url) = 24 then
  insert into channel (channel id, url, lang, category, theme,
fk user id)
  values (channel id or url, 'https://www.youtube.com/channel/'
|| channel id or url, lang, category, theme, (select user id
from username where username = user name));
elsif length(channel id or url) = 56 then
  insert into channel (channel id, url, lang, category, theme,
fk user id)
  values (substring(channel id or url from 33 for 56),
channel id or url, lang, category, theme, (select user id from
username where username = user name));
  raise exception 'wrong length of channel id or url';
end if;
```

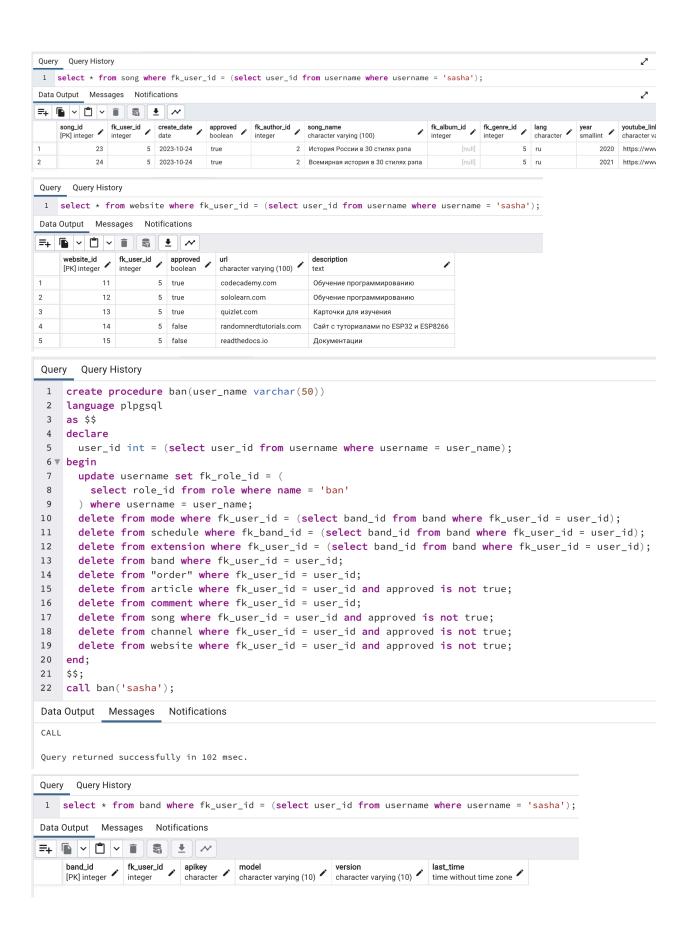
```
end $$;
insert into channel('https://www.youtube.com/channel/UCz9tNkbNLP
select * from channel where channel id =
'UCz9tNkbNLP8HoZipU6KX7NA';
call insert into channel('UCaDZLsDEEBBJESXmmi-9m5w', 'en',
 edu', 'it', 'andrei');
select * from channel where url =
https://www.youtube.com/channel/UCaDZLsDEEBBJESXmmi-9m5w';
call insert into channel('itsmorethanuniversity', 'en', 'edu',
  it', 'andrei');
 Query Query History
  1 create procedure insert_into_channel(channel_id_or_url varchar(56), lang char(2), category varchar(50), theme varchar(50), user_name
     language plpgsql
        if length(channel_id_or_url) = 24 then
          insert into channel(channel_id, url, lang, category, theme, fk_user_id)
           values (channel_id_or_url, 'https://www.youtube.com/channel/' || channel_id_or_url, lang, category, theme, (select user_id from
        elsif length(channel_id_or_url) = 56 then
           insert into channel(channel_id, url, lang, category, theme, fk_user_id)
           values (substring(channel_id_or_url from 33 for 56), channel_id_or_url, lang, category, theme, (select user_id from username whe
 10
 11
          raise exception 'wrong length of channel id or url';
 12
        end if;
 13 end $$;
     call insert_into_channel('https://www.youtube.com/channel/UCz9tNkbNLP8HoZipU6KX7NA', 'en', 'edu', 'it', 'andrei');
     select * from channel where channel_id = 'UCz9tNkbNLP8HoZipU6KX7NA';
 Data Output Messages Notifications
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                             r url character
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                                                                                                                                                       edu
 Query Query History
  call insert_into_channel('UCaDZLsDEEBBJESXmmi-9m5w', 'en', 'edu', 'it', 'andrei');
      select * from channel where url = 'https://www.youtube.com/channel/UCaDZLsDEEBBJESXmmi-9m5w';
 Data Output Messages Notifications
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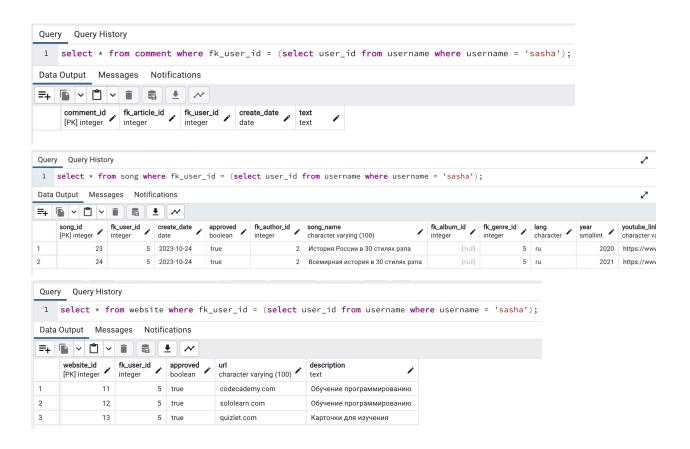
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                                                                                                                           [null]
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                                                                                                                                                        edu
  Query Query History
   1 call insert_into_channel('itsmorethanuniversity', 'en', 'edu', 'it', 'andrei');
  Data Output Messages Notifications
  ERROR: wrong length of channel id or url
  CONTEXT: PL/pgSQL function insert_into_channel(character varying,character,character varying,character varying,character varying) line 9 at RAISE
  SOL state: P0001
```

Процедура бана пользователя по нику. Замена роли на 'ban', удаление браслетов, заказов, статей (не подтверждённых), комментариев, песен (не подтверждённых), каналов (не подтверждённых), сайтов (не подтверждённых) пользователя

```
create procedure ban(user name varchar(50))
language plpgsql
as $$
declare
user id int = (select user id from username where username =
user name);
begin
update username set fk role id = (
  select role id from role where name = 'ban'
) where username = user name;
delete from mode where fk user id = (select band id from band
where fk user id = user id);
delete from schedule where fk band id = (select band id from
band where fk user id = user id);
delete from extension where fk user id = (select band id from
band where fk user id = user id);
delete from band where fk user id = user id;
delete from "order" where fk user id = user id;
delete from article where fk user id = user id and approved is
not true;
delete from comment where fk user id = user id;
delete from song where fk user id = user id and approved is not
true;
```

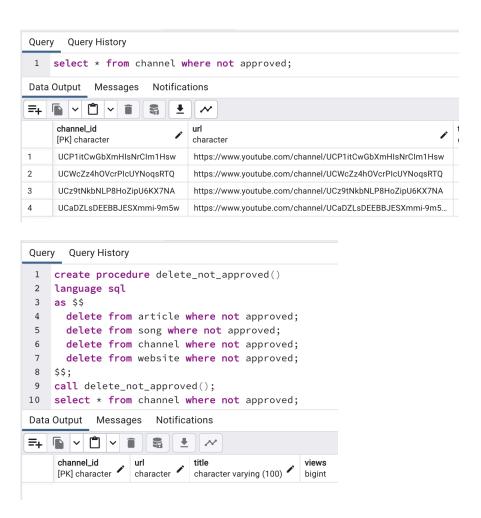
```
delete from channel where fk user id = user id and approved is
not true;
  delete from website where fk user id = user id and approved is
not true;
end;
$$;
call ban('sasha');
select * from band where fk user id = (select user id from
username where username = 'sasha');
select * from comment where fk user id = (select user id from
username where username = 'sasha');
select * from song where fk user id = (select user id from
username where username = 'sasha');
select * from website where fk user id = (select user id from
username where username = 'sasha');
  Query Query History
    1 select * from band where fk_user_id = (select user_id from username where username = 'sasha');
   Data Output Messages Notifications
   =+ 6 ∨ 1 ∨ 1 8 ± *
           band_id | fk_user_id | apikey | character | model | character varying (10) | character varying (
                                           5 ICb0OlyAN9x35t8AdM9j 2.2
                                                                                                                     0.2
                                                                                                                                                 [null]
                          5
   Query Query History
    1 select * from comment where fk_user_id = (select user_id from username where username = 'sasha');
   Data Output Messages Notifications
   =+ ( v ( 1 v ( 1 1 3 1 2 2 2
           comment_id | fk_article_id | fk_user_id | create_date | text | text |
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                                                                                             Кринж
                                                                  5 2023-12-24
                               3 5 2023-12-25
4 5 2023-12-25
5 5 2023-12-26
                           6
                                                                                             Кринж
                                                                                            Кринжовый кринж
                                                                                            Кринж
                                                                   5 2023-12-26 Кринжовый кринж
```





Удалить все неподтверждённые статьи, песни, каналы, сайты

```
create procedure delete_not_approved()
language sql
as $$
delete from article where not approved;
delete from song where not approved;
delete from channel where not approved;
delete from website where not approved;
$$;
call delete_not_approved();
select * from channel where not approved;
```



Триггер, который автоматически повышает пользователя до vip, если он набрал 15 баллов. По 1 баллу за одобренный канал, сайт, песню; 5 баллов за статью.

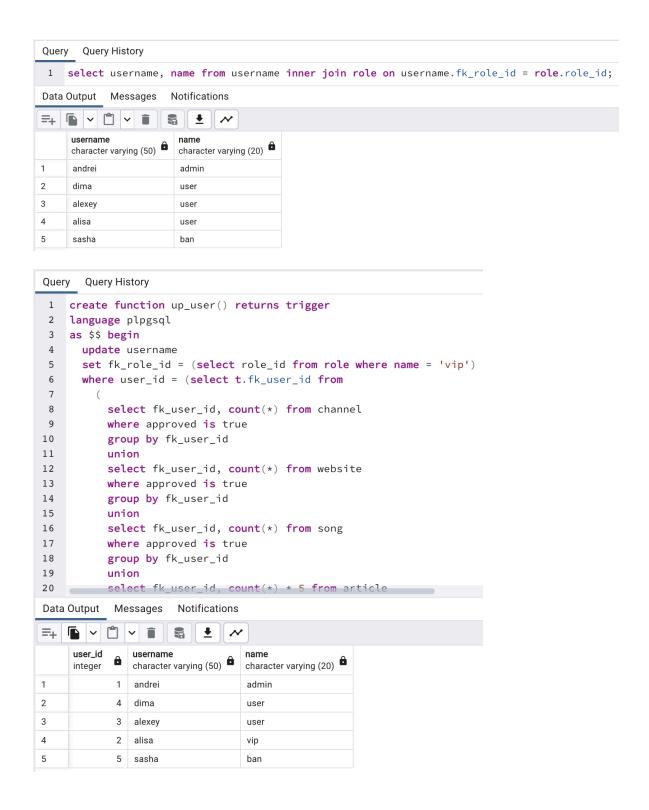
```
create procedure up_user()
language plpgsql
as $$

update username
set fk_role_id = (select role_id from role where name = 'vip')
where user_id = (select t.fk_user_id from

(
    select fk_user_id, count(*) from channel
    where approved is true
    group by fk_user_id
...
```

```
select fk user id, count(*) from website
    where approved is true
    group by fk_user_id
    select fk user id, count(*) from song
    where approved is true
    group by fk user id
    select fk_user_id, count(*) * 5 from article
    where approved is true
    group by fk_user_id
  inner join username on t.fk user id = username.user id
  inner join role on username.fk role id = role.role id
  where role.name = 'user'
  group by fk_user_id
  having sum(t.count) >= 15
);
$$;
create trigger up_user_channel
after update on channel
for each row
```

```
execute procedure up user();
create trigger up user website
after update on website
execute procedure up user();
create trigger up user song
after update on song
execute procedure up user();
create trigger up user article
after update on article
execute procedure up user();
select username, name from username inner join role on
username.fk role id = role.role id;
insert into article(fk user id, title, create date, approved,
text)
values (2, 'Процедуры, функции, триггеры в PostgreSQL',
'2024-01-01', true, 'Цель работы: овладеть практическими
создания и использования процедур, функций и триггеров в базе
данных PostgreSQL.\nОборудование: компьютерный
класс.\nПрограммное обеспечение: СУБД PostgreSQL, SQL Shell
```



Вывод

В ходе лабораторной работы освоена работа с процедурами, функциями и триггерами.