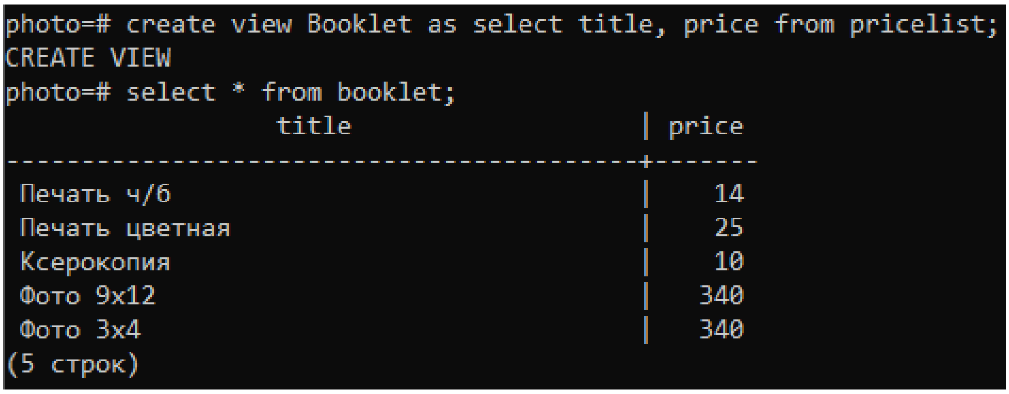
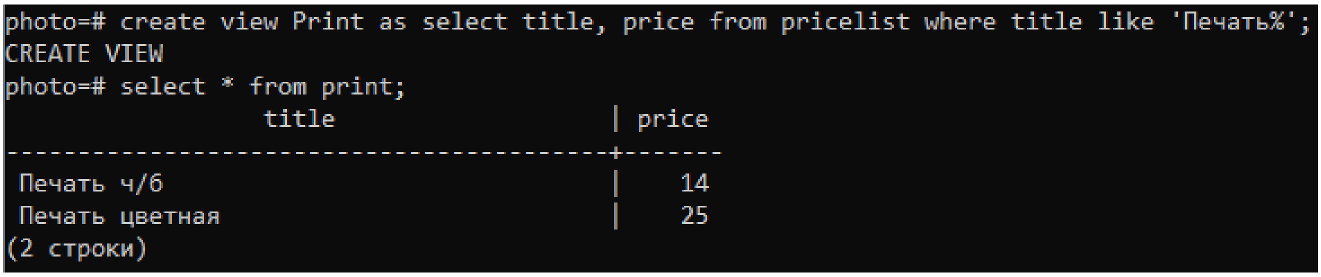
Используем представление для скрытия столбцов. Следующая команда будет содержать название и цену услуги.



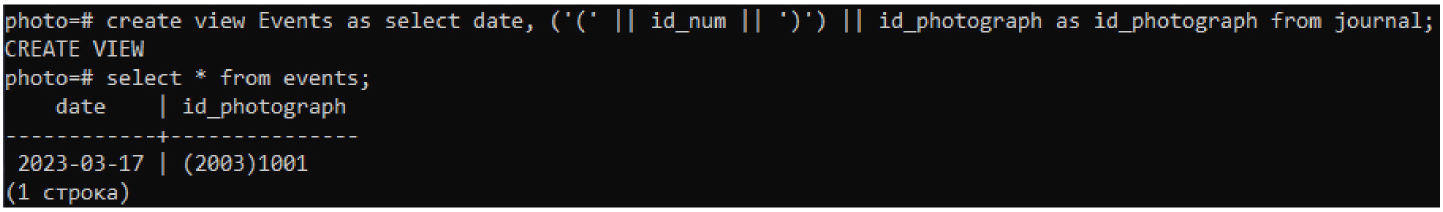
```
photo=# create view Booklet as select title, price from pricelist;
CREATE VIEW
photo=# select * from booklet;
                 title                  | price
----------------------------------------+-------
 Печать ч/б                             |    14
 Печать цветная                         |    25
 Ксерокопия                             |    10
 Фото 9x12                              |   340
 Фото 3x4                               |   340
(5 строк)
```

Теперь скроем строки. Следующая команда будет содержать название и цену услуг печати.



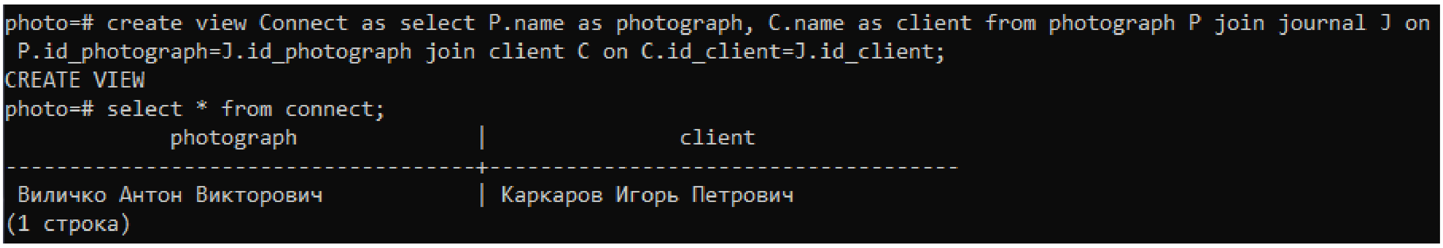
```
photo=# create view Print as select title, price from pricelist where title like 'Печать%';
CREATE VIEW
photo=# select * from print;
                 title                  | price
----------------------------------------+-------
 Печать ч/б                             |    14
 Печать цветная                         |    25
(2 строки)
```

Используем представление для отображения вычисляемых столбцов. Представление объединит столбцы date и id_photograph.



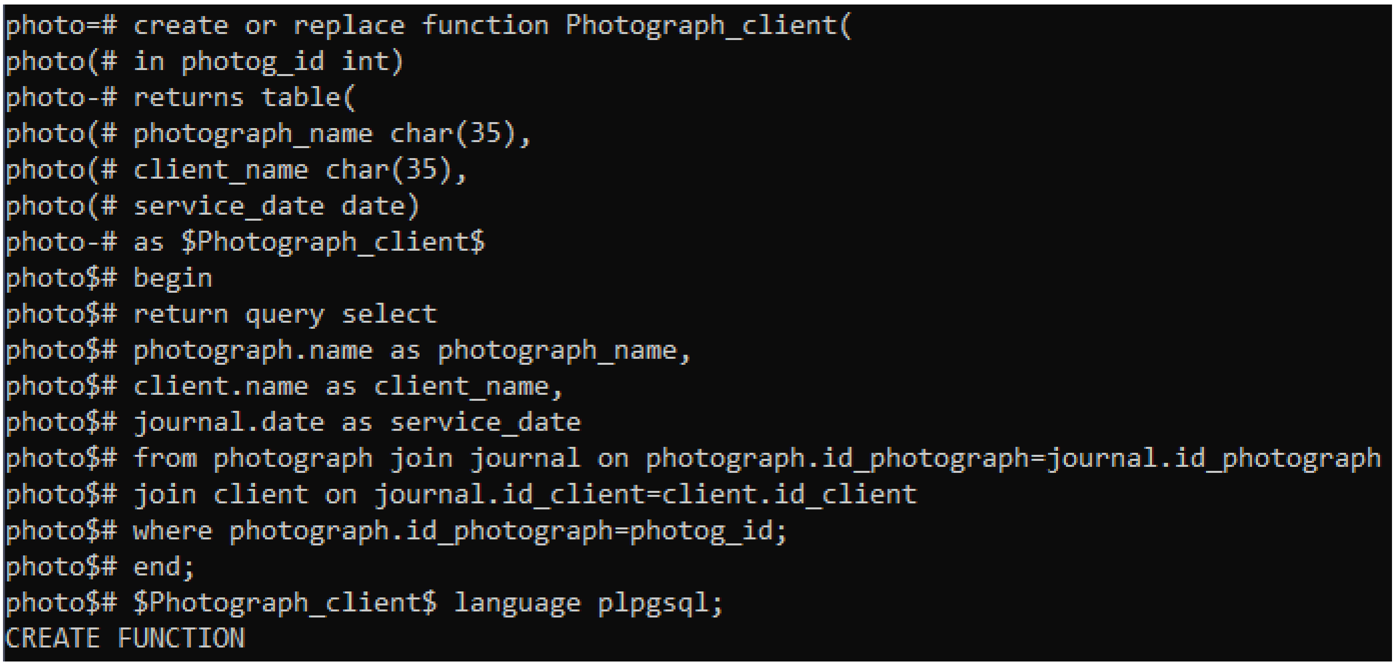
```
photo=# create view Events as select date, ('(' || id_num || ')') || id_photograph as id_photograph from journal;
CREATE VIEW
photo=# select * from events;
    date    | id_photograph
------------+---------------
 2023-03-17 | (2003)1001
(1 строка)
```

Используем представление для скрытия сложного синтаксиса. Отобразим сведения о том, какой фотограф обслужил клиента.

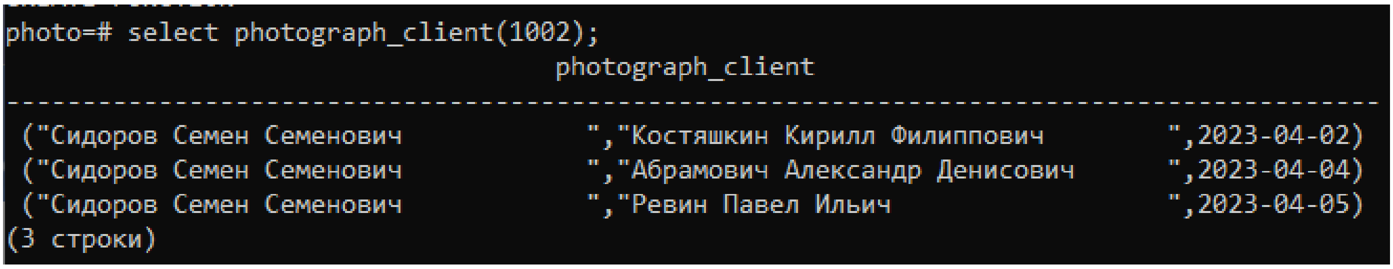


```
photo=# create view Connect as select P.name as photograph, C.name as client from photograph P join journal J on
 P.id_photograph=J.id_photograph join client C on C.id_client=J.id_client;
CREATE VIEW
photo=# select * from connect;
            photograph             |               client
-----------------------------------+-----------------------------------
 Виличко Антон Викторович          | Каркаров Игорь Петрович
(1 строка)
```

Создадим хранимую процедуру, которая будет выводить всех клиентов и дату обслуживания фотографа.

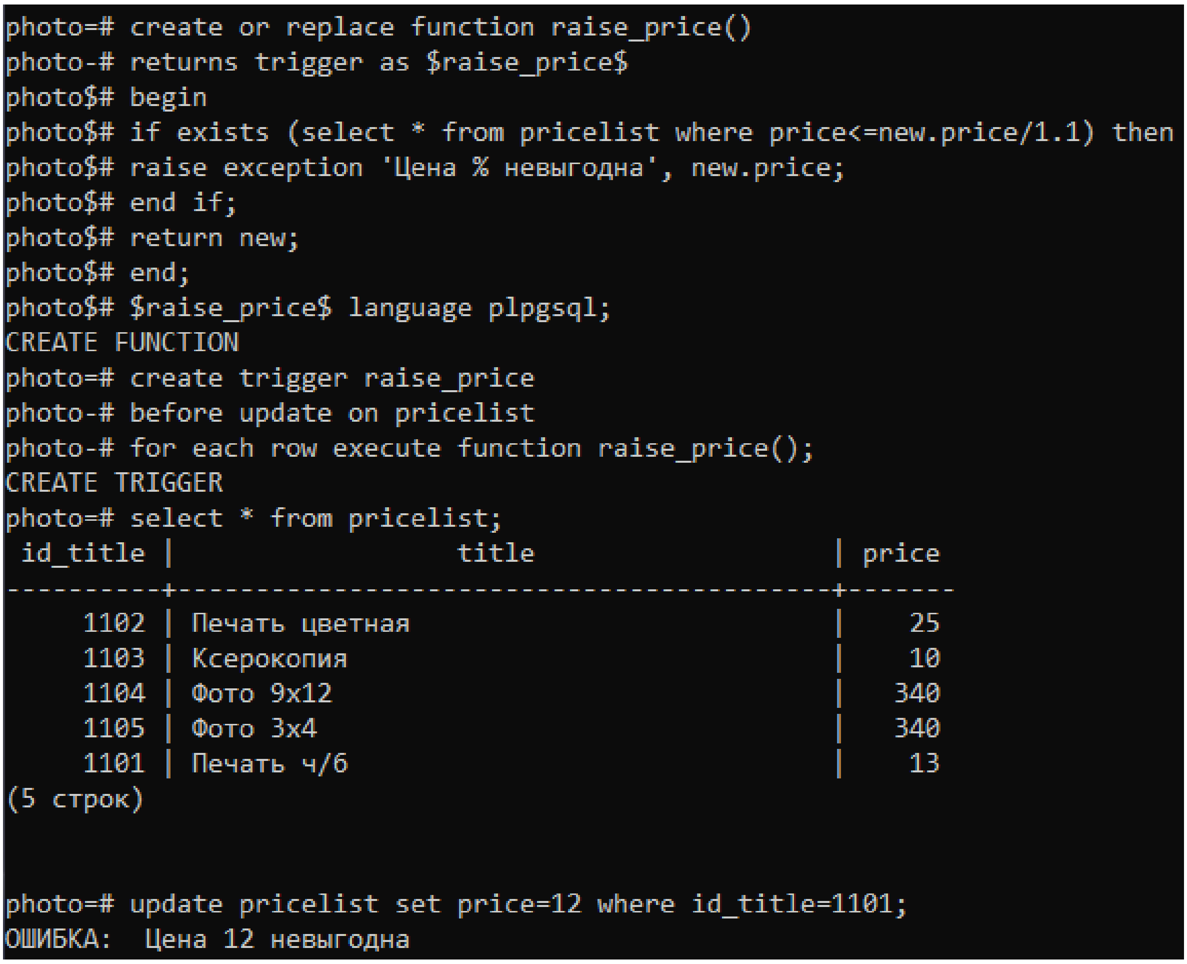


```
photo=# create or replace function Photograph_client(
photo(# in photog_id int)
photo-# returns table(
photo(# photograph_name char(35),
photo(# client_name char(35),
photo(# service_date date)
photo-# as $Photograph_client$
photo$# begin
photo$# return query select
photo$# photograph.name as photograph_name,
photo$# client.name as client_name,
photo$# journal.date as service_date
photo$# from photograph join journal on photograph.id_photograph=journal.id_photograph
photo$# join client on journal.id_client=client.id_client
photo$# where photograph.id_photograph=photog_id;
photo$# end;
photo$# $Photograph_client$ language plpgsql;
CREATE FUNCTION
```



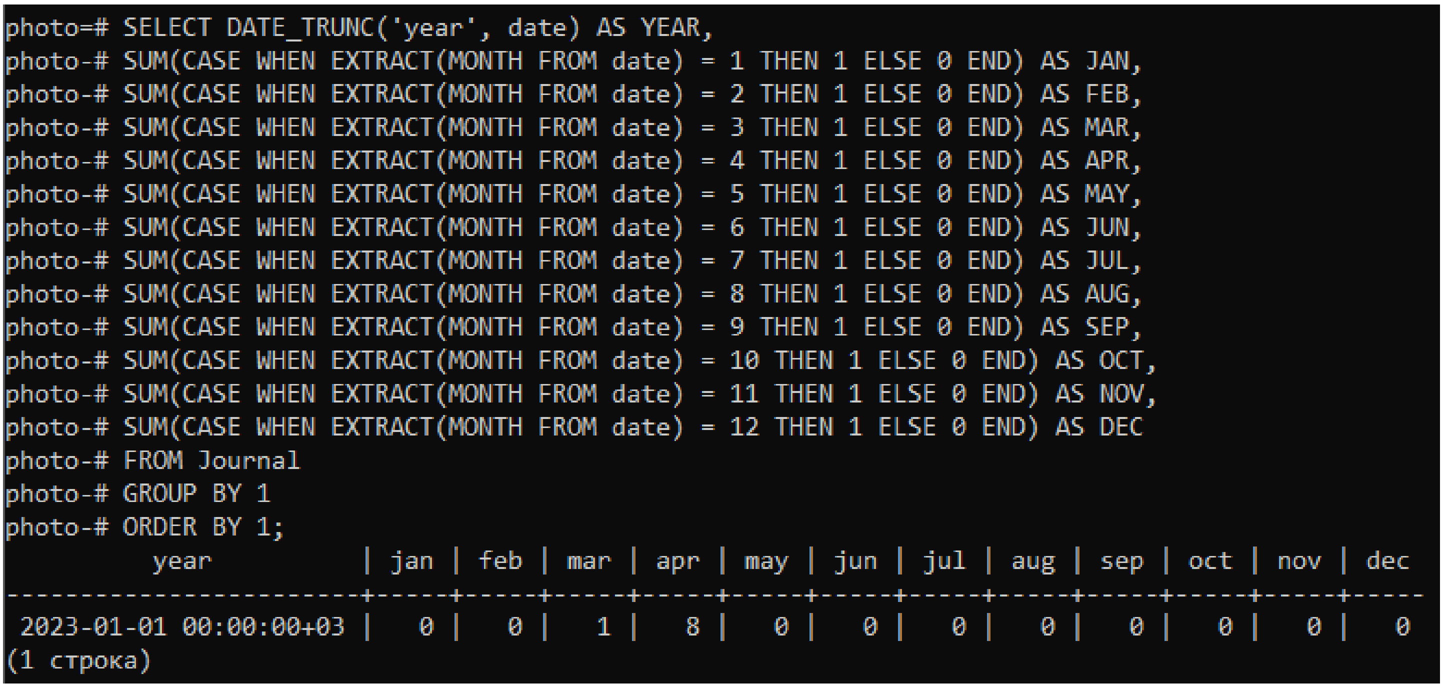
```
photo=# select photograph_client(1002);
                                    photograph_client
------------------------------------------------------------------------------------------
 ("Сидоров Семен Семенович            ","Костяшкин Кирилл Филиппович        ",2023-04-02)
 ("Сидоров Семен Семенович            ","Абрамович Александр Денисович      ",2023-04-04)
 ("Сидоров Семен Семенович            ","Ревин Павел Ильич                  ",2023-04-05)
(3 строки)
```

Создадим триггер, который относится к типу предваряющего триггера обновления данных. Триггер позволит повысить цену услуги, услуги она больше предыдущей в 1.1.



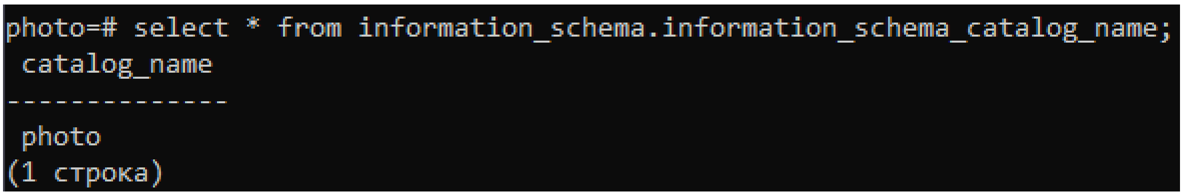
```
photo=# create or replace function raise_price()
photo-# returns trigger as $raise_price$
photo$# begin
photo$# if exists (select * from pricelist where price<=new.price/1.1) then
photo$# raise exception 'Цена % невыгодна', new.price;
photo$# end if;
photo$# return new;
photo$# end;
photo$# $raise_price$ language plpgsql;
CREATE FUNCTION
photo=# create trigger raise_price
photo-# before update on pricelist
photo-# for each row execute function raise_price();
CREATE TRIGGER
photo=# select * from pricelist;
 id_title |                  title                           | price
----------+-------------------------------------------------+-------
     1102 | Печать цветная                                  |    25
     1103 | Ксерокопия                                      |    10
     1104 | Фото 9x12                                       |   340
     1105 | Фото 3x4                                        |   340
     1101 | Печать ч/6                                      |    13
(5 строк)


photo=# update pricelist set price=12 where id_title=1101;
ОШИБКА:  Цена 12 невыгодна
```

Создадим сводную таблицу, которая выведет количество услуг в каждом месяце.



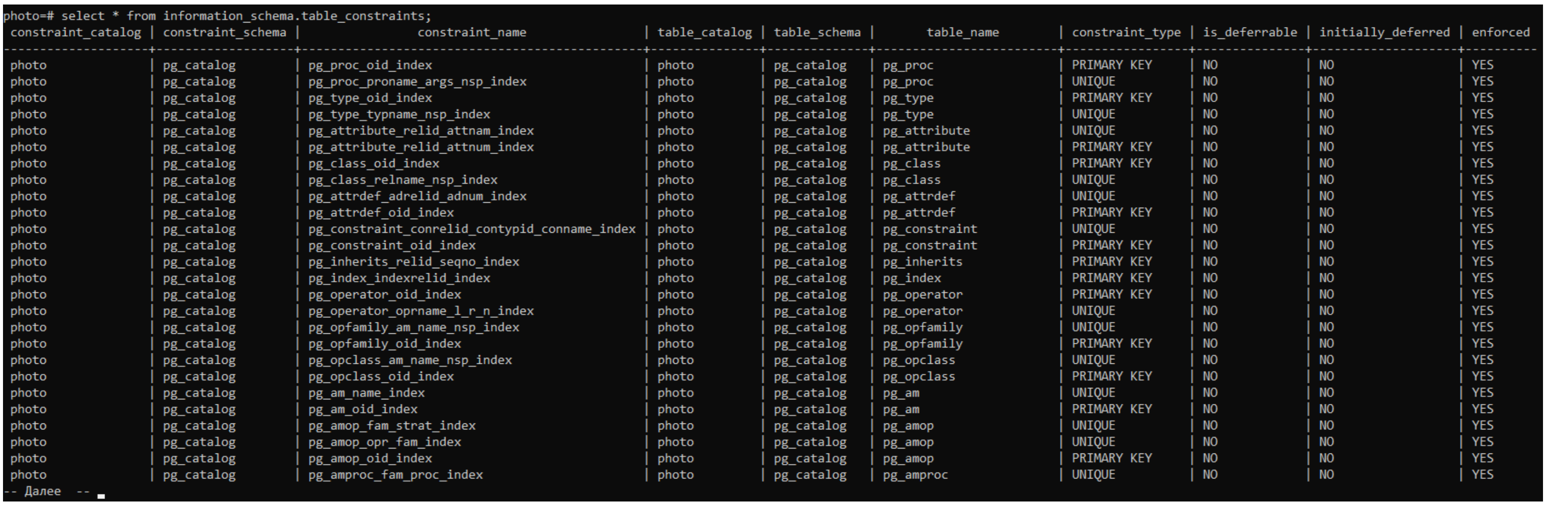
```
photo=# SELECT DATE_TRUNC('year', date) AS YEAR,
photo-# SUM(CASE WHEN EXTRACT(MONTH FROM date) = 1 THEN 1 ELSE 0 END) AS JAN,
photo-# SUM(CASE WHEN EXTRACT(MONTH FROM date) = 2 THEN 1 ELSE 0 END) AS FEB,
photo-# SUM(CASE WHEN EXTRACT(MONTH FROM date) = 3 THEN 1 ELSE 0 END) AS MAR,
photo-# SUM(CASE WHEN EXTRACT(MONTH FROM date) = 4 THEN 1 ELSE 0 END) AS APR,
photo-# SUM(CASE WHEN EXTRACT(MONTH FROM date) = 5 THEN 1 ELSE 0 END) AS MAY,
photo-# SUM(CASE WHEN EXTRACT(MONTH FROM date) = 6 THEN 1 ELSE 0 END) AS JUN,
photo-# SUM(CASE WHEN EXTRACT(MONTH FROM date) = 7 THEN 1 ELSE 0 END) AS JUL,
photo-# SUM(CASE WHEN EXTRACT(MONTH FROM date) = 8 THEN 1 ELSE 0 END) AS AUG,
photo-# SUM(CASE WHEN EXTRACT(MONTH FROM date) = 9 THEN 1 ELSE 0 END) AS SEP,
photo-# SUM(CASE WHEN EXTRACT(MONTH FROM date) = 10 THEN 1 ELSE 0 END) AS OCT,
photo-# SUM(CASE WHEN EXTRACT(MONTH FROM date) = 11 THEN 1 ELSE 0 END) AS NOV,
photo-# SUM(CASE WHEN EXTRACT(MONTH FROM date) = 12 THEN 1 ELSE 0 END) AS DEC
photo-# FROM Journal
photo-# GROUP BY 1
photo-# ORDER BY 1;
          year          | jan | feb | mar | apr | may | jun | jul | aug | sep | oct | nov | dec
------------------------+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
 2023-01-01 00:00:00+03 |   0 |   0 |   1 |   8 |   0 |   0 |   0 |   0 |   0 |   0 |   0 |   0
(1 строка)
```

Получим имя текущей базы данных.



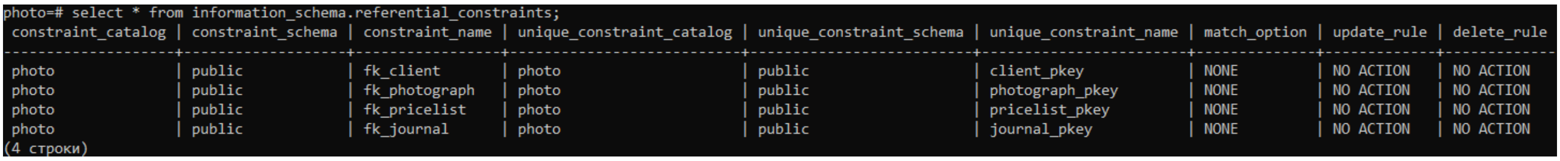
```
photo=# select * from information_schema.information_schema_catalog_name;
 catalog_name
--------------
 photo
(1 строка)
```

Получим список ограничений.



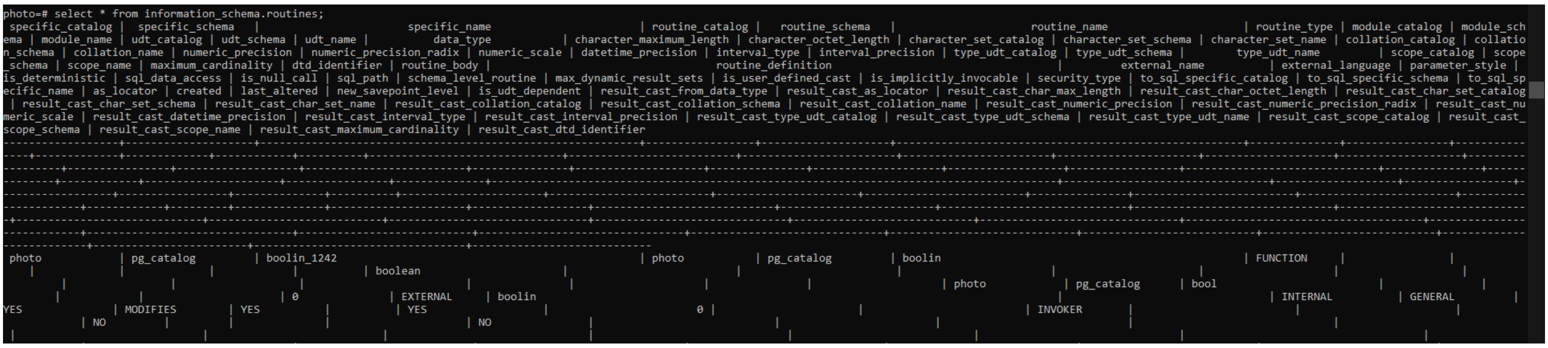
```
photo=# select * from information_schema.table_constraints;
 constraint_catalog | constraint_schema |                constraint_name                | table_catalog | table_schema |       table_name       | constraint_type | is_deferrable | initially_deferred | enforced
--------------------+-------------------+-----------------------------------------------+---------------+--------------+------------------------+-----------------+---------------+--------------------+----------
 photo              | pg_catalog        | pg_proc_oid_index                             | photo         | pg_catalog   | pg_proc                | PRIMARY KEY     | NO            | NO                 | YES
 photo              | pg_catalog        | pg_proc_proname_args_nsp_index                | photo         | pg_catalog   | pg_proc                | UNIQUE          | NO            | NO                 | YES
 photo              | pg_catalog        | pg_type_oid_index                             | photo         | pg_catalog   | pg_type                | PRIMARY KEY     | NO            | NO                 | YES
 photo              | pg_catalog        | pg_type_typname_nsp_index                     | photo         | pg_catalog   | pg_type                | UNIQUE          | NO            | NO                 | YES
 photo              | pg_catalog        | pg_attribute_relid_attnam_index               | photo         | pg_catalog   | pg_attribute           | UNIQUE          | NO            | NO                 | YES
 photo              | pg_catalog        | pg_attribute_relid_attnum_index               | photo         | pg_catalog   | pg_attribute           | PRIMARY KEY     | NO            | NO                 | YES
 photo              | pg_catalog        | pg_class_oid_index                            | photo         | pg_catalog   | pg_class               | PRIMARY KEY     | NO            | NO                 | YES
 photo              | pg_catalog        | pg_class_relname_nsp_index                    | photo         | pg_catalog   | pg_class               | UNIQUE          | NO            | NO                 | YES
 photo              | pg_catalog        | pg_attrdef_adrelid_adnum_index                | photo         | pg_catalog   | pg_attrdef             | UNIQUE          | NO            | NO                 | YES
 photo              | pg_catalog        | pg_attrdef_oid_index                          | photo         | pg_catalog   | pg_attrdef             | PRIMARY KEY     | NO            | NO                 | YES
 photo              | pg_catalog        | pg_constraint_conrelid_contypid_conname_index | photo         | pg_catalog   | pg_constraint          | UNIQUE          | NO            | NO                 | YES
 photo              | pg_catalog        | pg_constraint_oid_index                       | photo         | pg_catalog   | pg_constraint          | PRIMARY KEY     | NO            | NO                 | YES
 photo              | pg_catalog        | pg_inherits_relid_seqno_index                 | photo         | pg_catalog   | pg_inherits            | PRIMARY KEY     | NO            | NO                 | YES
 photo              | pg_catalog        | pg_index_indexrelid_index                     | photo         | pg_catalog   | pg_index               | PRIMARY KEY     | NO            | NO                 | YES
 photo              | pg_catalog        | pg_operator_oid_index                         | photo         | pg_catalog   | pg_operator            | PRIMARY KEY     | NO            | NO                 | YES
 photo              | pg_catalog        | pg_operator_oprname_l_r_n_index               | photo         | pg_catalog   | pg_operator            | UNIQUE          | NO            | NO                 | YES
 photo              | pg_catalog        | pg_opfamily_am_name_nsp_index                 | photo         | pg_catalog   | pg_opfamily            | UNIQUE          | NO            | NO                 | YES
 photo              | pg_catalog        | pg_opfamily_oid_index                         | photo         | pg_catalog   | pg_opfamily            | PRIMARY KEY     | NO            | NO                 | YES
 photo              | pg_catalog        | pg_opclass_am_name_nsp_index                  | photo         | pg_catalog   | pg_opclass             | UNIQUE          | NO            | NO                 | YES
 photo              | pg_catalog        | pg_opclass_oid_index                          | photo         | pg_catalog   | pg_opclass             | PRIMARY KEY     | NO            | NO                 | YES
 photo              | pg_catalog        | pg_am_name_index                              | photo         | pg_catalog   | pg_am                  | UNIQUE          | NO            | NO                 | YES
 photo              | pg_catalog        | pg_am_oid_index                               | photo         | pg_catalog   | pg_am                  | PRIMARY KEY     | NO            | NO                 | YES
 photo              | pg_catalog        | pg_amop_fam_strat_index                       | photo         | pg_catalog   | pg_amop                | UNIQUE          | NO            | NO                 | YES
 photo              | pg_catalog        | pg_amop_opr_fam_index                         | photo         | pg_catalog   | pg_amop                | UNIQUE          | NO            | NO                 | YES
 photo              | pg_catalog        | pg_amop_oid_index                             | photo         | pg_catalog   | pg_amop                | PRIMARY KEY     | NO            | NO                 | YES
 photo              | pg_catalog        | pg_amproc_fam_proc_index                      | photo         | pg_catalog   | pg_amproc              | UNIQUE          | NO            | NO                 | YES
-- Далее  --
```

Получим список внешних ключей.



```
photo=# select * from information_schema.referential_constraints;
 constraint_catalog | constraint_schema | constraint_name | unique_constraint_catalog | unique_constraint_schema | unique_constraint_name | match_option | update_rule | delete_rule
--------------------+-------------------+-----------------+---------------------------+--------------------------+------------------------+--------------+-------------+-------------
 photo              | public            | fk_client       | photo                     | public                   | client_pkey            | NONE         | NO ACTION   | NO ACTION
 photo              | public            | fk_photograph   | photo                     | public                   | photograph_pkey        | NONE         | NO ACTION   | NO ACTION
 photo              | public            | fk_pricelist    | photo                     | public                   | pricelist_pkey         | NONE         | NO ACTION   | NO ACTION
 photo              | public            | fk_journal      | photo                     | public                   | journal_pkey           | NONE         | NO ACTION   | NO ACTION
(4 строки)
```

Получим список хранимых процедур.



```
photo=# select * from information_schema.routines;
 specific_catalog |  specific_schema   |                       specific_name                       | routine_catalog |   routine_schema   |                       routine_name                       | routine_type | module_catalog | module_sch
ema | module_name | udt_catalog | udt_schema | udt_name |          data_type          | character_maximum_length | character_octet_length | character_set_catalog | character_set_schema | character_set_name | collation_catalog | collatio
n_schema | collation_name | numeric_precision | numeric_precision_radix | numeric_scale | datetime_precision | interval_type | interval_precision | type_udt_catalog | type_udt_schema |        type_udt_name         | scope_catalog | scope
_schema | scope_name | maximum_cardinality | dtd_identifier | routine_body |                                routine_definition                                |         external_name         | external_language | parameter_style |
is_deterministic | sql_data_access | is_null_call | sql_path | schema_level_routine | max_dynamic_result_sets | is_user_defined_cast | is_implicitly_invocable | security_type | to_sql_specific_catalog | to_sql_specific_schema | to_sql_sp
ecific_name | as_locator | created | last_altered | new_savepoint_level | is_udt_dependent | result_cast_from_data_type | result_cast_as_locator | result_cast_char_max_length | result_cast_char_octet_length | result_cast_char_set_catalog
 | result_cast_char_set_schema | result_cast_char_set_name | result_cast_collation_catalog | result_cast_collation_schema | result_cast_collation_name | result_cast_numeric_precision | result_cast_numeric_precision_radix | result_cast_nu
meric_scale | result_cast_datetime_precision | result_cast_interval_type | result_cast_interval_precision | result_cast_type_udt_catalog | result_cast_type_udt_schema | result_cast_type_udt_name | result_cast_scope_catalog | result_cast_
scope_schema | result_cast_scope_name | result_cast_maximum_cardinality | result_cast_dtd_identifier
------------------+--------------------+-----------------------------------------------------------+-----------------+--------------------+----------------------------------------------------------+--------------+----------------+-----------
----+-------------+-------------+------------+----------+-----------------------------+--------------------------+------------------------+-----------------------+----------------------+--------------------+-------------------+----------
---------+----------------+-------------------+-------------------------+---------------+--------------------+---------------+--------------------+------------------+-----------------+------------------------------+---------------+------
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------------+------------+---------+--------------+---------------------+------------------+----------------------------+------------------------+-----------------------------+-------------------------------+------------------------------
-+-----------------------------+---------------------------+-------------------------------+------------------------------+----------------------------+-------------------------------+-------------------------------------+---------------
-----------+--------------------------------+---------------------------+--------------------------------+------------------------------+-----------------------------+---------------------------+---------------------------+-------------
------------+------------------------+---------------------------------+----------------------------
 photo            | pg_catalog         | boolin_1242                                               | photo           | pg_catalog         | boolin                                                   | FUNCTION     |                |
    |             |             |            |          | boolean                     |                          |                        |                       |                      |                    |                   |
         |                |                   |                         |               |                    |               |                    | photo            | pg_catalog      | bool                         |               |
        |            |                     | 0              | EXTERNAL     | boolin                                                                           |                               | INTERNAL          | GENERAL         |
YES              | MODIFIES        | YES          |          | YES                  |                       0 |                      |                         | INVOKER       |                         |                        |
           | NO         |         |              |                     | NO               |                            |                        |                             |                               |
 |                           |                           |                               |                              |                            |                               |                                     |
```
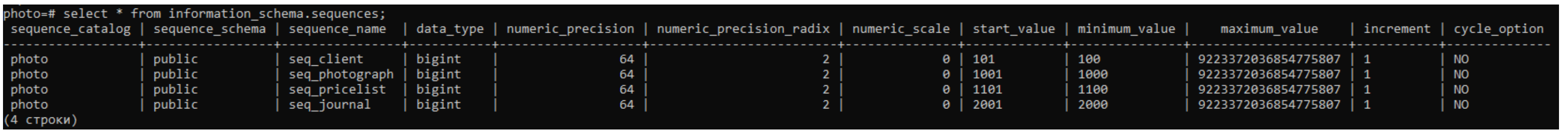
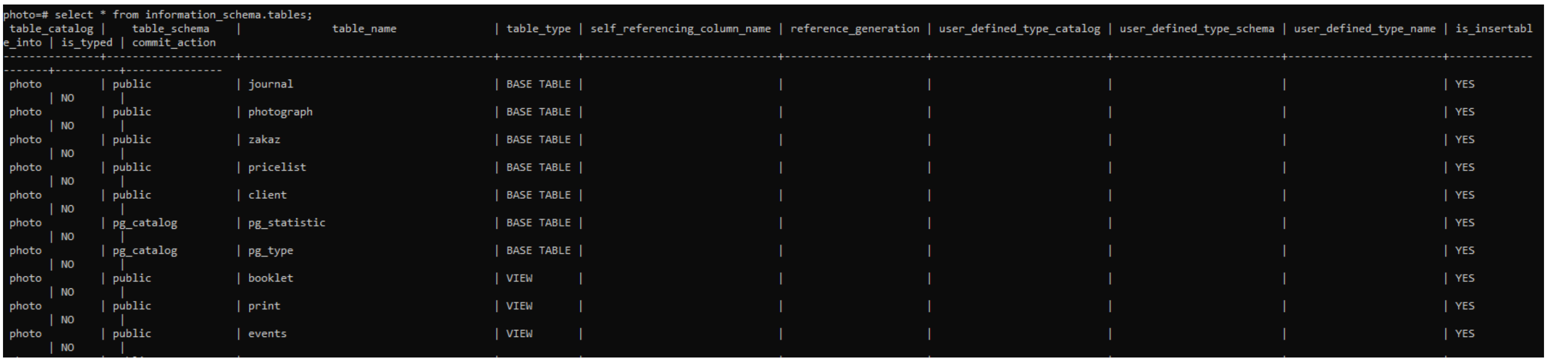

Получим список последовательностей.



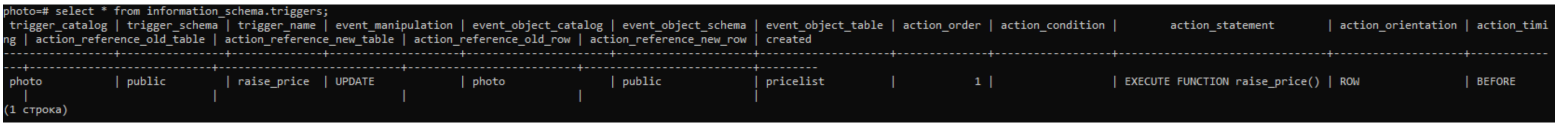
```
photo=# select * from information_schema.sequences;
 sequence_catalog | sequence_schema | sequence_name  | data_type | numeric_precision | numeric_precision_radix | numeric_scale | start_value | minimum_value |    maximum_value    | increment | cycle_option
------------------+-----------------+----------------+-----------+-------------------+-------------------------+---------------+-------------+---------------+---------------------+-----------+--------------
 photo            | public          | seq_client     | bigint    |                64 |                       2 |             0 | 101         | 100           | 9223372036854775807 | 1         | NO
 photo            | public          | seq_photograph | bigint    |                64 |                       2 |             0 | 1001        | 1000          | 9223372036854775807 | 1         | NO
 photo            | public          | seq_pricelist  | bigint    |                64 |                       2 |             0 | 1101        | 1100          | 9223372036854775807 | 1         | NO
 photo            | public          | seq_journal    | bigint    |                64 |                       2 |             0 | 2001        | 2000          | 9223372036854775807 | 1         | NO
(4 строки)
```

Получим список таблиц.



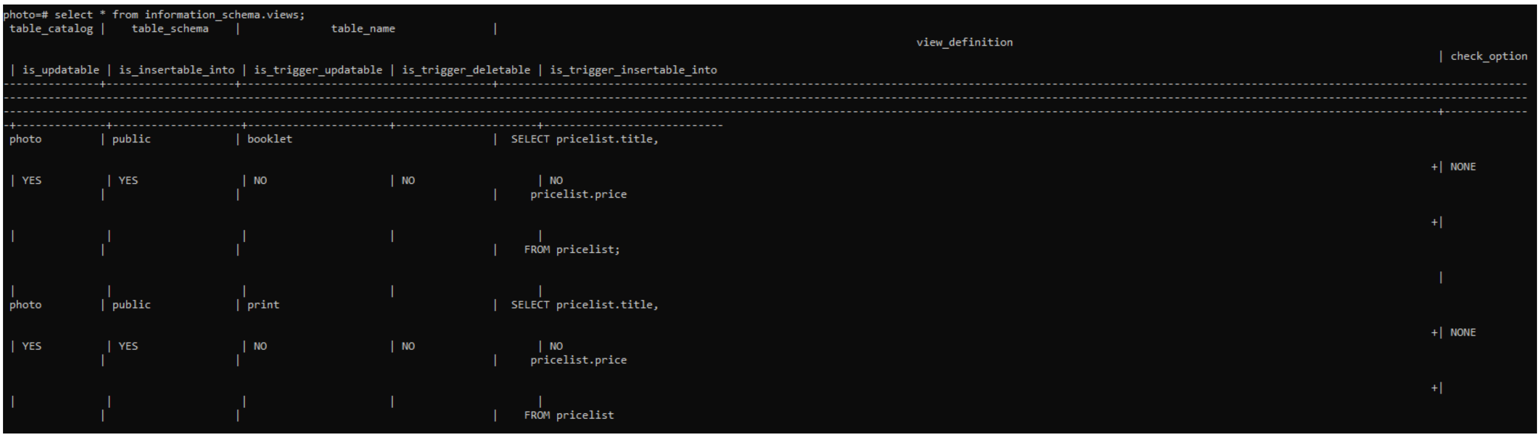
```
photo=# select * from information_schema.tables;
 table_catalog |    table_schema    |              table_name               | table_type | self_referencing_column_name | reference_generation | user_defined_type_catalog | user_defined_type_schema | user_defined_type_name | is_insertabl
e_into | is_typed | commit_action
---------------+--------------------+---------------------------------------+------------+------------------------------+----------------------+---------------------------+--------------------------+------------------------+-------------
-------+----------+---------------
 photo         | public             | journal                               | BASE TABLE |                              |                      |                           |                          |                        | YES
       | NO       |
 photo         | public             | photograph                            | BASE TABLE |                              |                      |                           |                          |                        | YES
       | NO       |
 photo         | public             | zakaz                                 | BASE TABLE |                              |                      |                           |                          |                        | YES
       | NO       |
 photo         | public             | pricelist                             | BASE TABLE |                              |                      |                           |                          |                        | YES
       | NO       |
 photo         | public             | client                                | BASE TABLE |                              |                      |                           |                          |                        | YES
       | NO       |
 photo         | pg_catalog         | pg_statistic                          | BASE TABLE |                              |                      |                           |                          |                        | YES
       | NO       |
 photo         | pg_catalog         | pg_type                               | BASE TABLE |                              |                      |                           |                          |                        | YES
       | NO       |
 photo         | public             | booklet                               | VIEW       |                              |                      |                           |                          |                        | YES
       | NO       |
 photo         | public             | print                                 | VIEW       |                              |                      |                           |                          |                        | YES
       | NO       |
 photo         | public             | events                                | VIEW       |                              |                      |                           |                          |                        | YES
       | NO       |
```

Получим список триггеров.



```
photo=# select * from information_schema.triggers;
 trigger_catalog | trigger_schema | trigger_name | event_manipulation | event_object_catalog | event_object_schema | event_object_table | action_order | action_condition |        action_statement        | action_orientation | action_timi
ng | action_reference_old_table | action_reference_new_table | action_reference_old_row | action_reference_new_row | created
-----------------+----------------+--------------+--------------------+----------------------+---------------------+--------------------+--------------+------------------+--------------------------------+--------------------+------------
---+----------------------------+----------------------------+--------------------------+--------------------------+---------
 photo           | public         | raise_price  | UPDATE             | photo                | public              | pricelist          |            1 |                  | EXECUTE FUNCTION raise_price() | ROW                | BEFORE
   |                            |                            |                          |                          |
(1 строка)
```

Получим список представлений.



```
photo=# select * from information_schema.views;
 table_catalog |    table_schema    |              table_name               |
                                                                                   view_definition
                                                                                                                                                              | check_option
 | is_updatable | is_insertable_into | is_trigger_updatable | is_trigger_deletable | is_trigger_insertable_into
---------------+--------------------+---------------------------------------+-----------------------------------------------------------------------------------------------------------------------------------------------------------------
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
-----------------------------------------------------------------------------------------------------------------------------------------------------------------+--------------
-+--------------+--------------------+----------------------+----------------------+----------------------------
 photo         | public             | booklet                               |  SELECT pricelist.title,
                                                                                                                                                             +| NONE
 | YES          | YES                | NO                   | NO                   | NO
               |                    |                                       |     pricelist.price
                                                                                                                                                             +|
 |              |                    |                      |                      |
               |                    |                                       |    FROM pricelist;
                                                                                                                                                              |
 |              |                    |                      |                      |
 photo         | public             | print                                 |  SELECT pricelist.title,
                                                                                                                                                             +| NONE
 | YES          | YES                | NO                   | NO                   | NO
               |                    |                                       |     pricelist.price
                                                                                                                                                             +|
 |              |                    |                      |                      |
               |                    |                                       |    FROM pricelist
```