

ФГБОУ ВО

«Заполярный государственный университет им. Н.М. Федоровского»

Кафедра __ИСиТ__

Специальность __ИЭ-21__

ОТЧЕТ

о выполнении лабораторной работы

Выполнил:

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Лабораторная работа №4

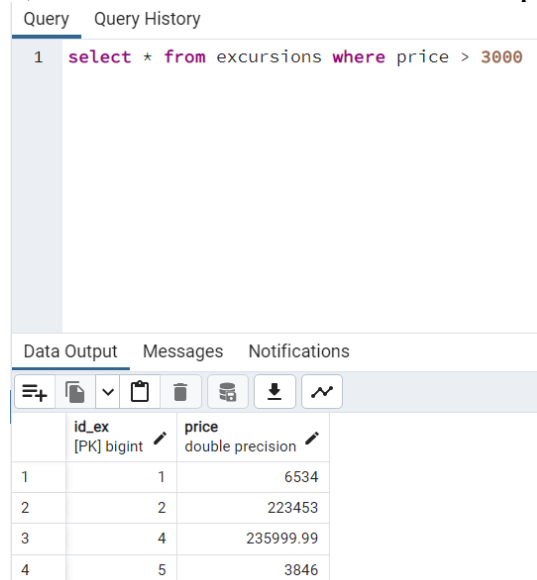
Тема: проектирование реляционной базы данных PostgreSQL

Тема: SQL. Запросы. Цель работы: Получение практических навыков работы с СУБД и языком SQL (оператор SELECT). Задание: Разработать запросы к базе данных, созданной и заполненной на предыдущих лабораторных работах, следующих видов:

- a. запрос с условием на числовые данные (>, <, =, between);
- b. запрос с условием на текстовые данные (LIKE, IN);
- c. запрос с вычисляемым полем;
- d. запрос к нескольким таблицам (без явного указания JOIN);
- e. запрос с агрегирующей функцией (AVG, SUM, COUNT, MIN, MAX);
- f. запрос с группировкой (GROUP BY);
- g. запрос с сортировкой (ORDER BY);
- h. запрос с вложенным подзапросом (не менее 3 видов);
- i. запрос с оператором UNION;
- j. запрос с оператором INTERSECT;
- k. запрос с оператором EXCEPT;
- l. запрос с выражением CASE;
- m. запрос с оператором JOIN (пять видов);
- n. иерархический запрос.

a.

1) select * from excursions where price > 3000



The screenshot shows a PostgreSQL query editor interface. At the top, there are tabs for 'Query' and 'Query History'. The 'Query' tab is active, displaying the SQL query: `1 select * from excursions where price > 3000`. Below the query editor, there are tabs for 'Data Output', 'Messages', and 'Notifications'. The 'Data Output' tab is active, showing a table with 4 rows and 2 columns. The columns are 'id_ex' (type: [PK] bigint) and 'price' (type: double precision). The rows contain the following data: (1, 6534), (2, 223453), (3, 235999.99), and (4, 3846).

	id_ex [PK] bigint	price double precision
1	1	6534
2	2	223453
3	4	235999.99
4	5	3846

2) select * from excursions where price between 2000 and 4000

Query

Query History

1

select * from excursions where price between 2000 and 4000

Data Output

Messages

Notifications

id_ex

[PK] bigint

price

double precision

1

3

2984.2

2

5

3846

b.

1)select * from hotel where city like 'B%'

Query

Query History









1

select * from hotel where city like 'B%'

Data Output

Messages

Notifications



	id_hotel [PK] bigint	country character varying (50)	city character varying (100)	stars integer
1	1	Russia	Bryansk	3
2	6	China	Beijing	5

2) select * from hotel where country in ('Belarus', 'Russia', 'China')

Query

Query History









1

select * from hotel where country in ('Belarus', 'Russia', 'China')

Data Output

Messages

Notifications



	id_hotel [PK] bigint	country character varying (50)	city character varying (100)	stars integer
1	1	Russia	Bryansk	3
2	4	Belarus	Minsk	5
3	6	China	Beijing	5

c. select *, price * 10 as megaprice from excursions

Query








Query History

1 select *, price * 10 as megaprice from excursions

Data Output

Messages

Notifications



	id_ex [PK] bigint	price double precision	megaprice double precision
1	1	6534	65340
2	2	223453	2234530
3	3	2984.2	29842
4	4	235999.99	2359999.9
5	5	3846	38460
6	6	28	280

d. `select distinct excursions.price, tour.price from excursions, tour`

Query

Query History

1

select distinct excursions.price, tour.price from excursions, tour

Data Output

Messages

Notifications

	price double precision	price double precision
1	235999.99	2843.324
2	6534	2843.324
3	3846	3524.34
4	28	392846
5	28	3524.34
6	235999.99	999999.99
7	6534	29842
8	2984.2	392846
9	235999.99	214.3534

e. `select max(price) as "Макс. стоимость" from excursions`

Query Query History

1 select max(price) as "Макс. стоимость" from excursions

Data Output Messages Notifications

Макс. стоимость
double precision

1235999.99

f. `select tour, count(*) from flights group by tour;`

Query

Query History

1 select tour, count(*) from flights group by tour;

Data Output

Messages

Notifications

g. select num, f_name, l_name from pilots order by l_name;

Query Query History			
1 select num, f_name, l_name from pilots order by l_name;			
Data Output Messages Notifications			
	num integer	f_name character varying (50)	Lname character varying (50)
1	328	Николай	Архипов
2	161	Олег	Гвоздев
3	128	Михаил	Ефимов
4	112	Алексей	Киров
5	190	Артём	Киров
6	137	Иван	Лебедев
7	212	Марина	Лучева
8	144	Александр	Назаров
9	157	Варвара	Некрасова

h.

1) select * from tour where price > (select avg(price) from tour)

Query Query History			
1 select * from tour where price > (select avg(price) from tour)			
Data Output Messages Notifications			
	id_tour [PK] bigint	price double precision	id_hotel bigint
1	4	999999.99	6
2	5	392846	3

2) select * from tour where id_hotel = (select id_hotel from hotel where city like 'Ak%');

Query Query History			
1 select * from tour where id_hotel = (select id_hotel from hotel where city like 'Ak%');			
Data Output Messages Notifications			
	id_tour [PK] bigint	price double precision	id_hotel bigint
1	2	214.3534	3
2	5	392846	3

3) select * from hotel where id_hotel = (select id_hotel from tour where price = (select max(price) from tour));

Query

Query History

```
1 select * from hotel where id_hotel = (select id_hotel from tour where price = (select max(price) from tour))
```

Data Output

Messages

Notifications

	id_hotel [PK] bigint	country character varying (50)	city character varying (100)	stars integer
1	6	China	Beijing	5

i. select * from excursions UNION select id_tour, price from tour

Query

Query History

```

1  (select * from excursions)
2  UNION
3  (select id_tour, price from tour)

```

Data Output

Messages

Notifications

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	id_ex bigint	price double precision
1	6	2843.324
2	1	6534
3	5	3846
4	3	29842
5	1	3524.34
6	2	214.3534
7	2	223453
8	6	28
9	4	235999.99
10	5	392846
11	3	2984.2
12	4	999999.99

j. select f_name from customers INTERSECT select f_name from employees;

Query		Query History	
<pre>1 select f_name from customers 2 INTERSECT 3 select f_name from employees;</pre>			
Data Output		Messages	Notifications
<div><div></div></div>			
	f_name character varying (20) 		
1	Boris		

k. select f_name from customers except select f_name from employees;

Query		Query History
1	select f_name from customers	
2	except	
3	select f_name from employees;	

Data Output		Messages	Notifications
	f_name character varying (20)		
1	Veronika		
2	Ekaterina		
3	Artem		
4	Margo		
5	Ilya		

l. select price, case when price <3000 then 'дёшево' when price between 3000 and 7000 then 'дорого' when price >200000 then 'оверпрайс' end lvl_price from excursions

Query		Query History
1	select price, case	
2	when price <3000 then 'дёшево'	
3	when price between 3000 and 7000 then 'дорого'	
4	when price >200000 then 'оверпрайс'	
5	end lvl_price	
6	from excursions	

Data Output		Messages	Notifications
	price double precision	lvl_price text	
1	6534	дорого	
2	223453	оверпрайс	
3	2984.2	дёшево	
4	235999.99	оверпрайс	
5	3846	дорого	
6	28	дёшево	

m.

1) select * from tour left join hotel on hotel.id_hotel = tour.id_hotel where stars = 4

Query		Query History
1	select * from tour left join hotel on hotel.id_hotel = tour.id_hotel where stars = 4	

Data Output		Messages	Notifications
	id_tour bigint	price double precision	id_hotel bigint
1	1	3524.34	5
2	2	214.3534	3
3	5	392846	3

2) select * from tour right join hotel on hotel.id_hotel = tour.id_hotel where stars=4

Query

Query History

```
1 select * from tour right join hotel on hotel.id_hotel = tour.id_hotel where stars = 4
```

Data Output

Messages

Notifications

	id_tour bigint	price double precision	id_hotel bigint	id_hotel bigint	country character varying (50)	city character varying (100)	stars integer
1	1	3524.34	5	5	Greece	Athens	4
2	2	214.3534	3	3	Island	Akureyri	4
3	5	392846	3	3	Island	Akureyri	4
4	[null]	[null]	[null]	2	USA	Columbus	4

3) select * from employees inner join orders on employees.id_emp = orders.id_emp

Query

Query History

1

select * from employees inner join orders on employees.id_emp = orders.id_emp

2

Data Output

Messages

Notifications

	id_emp bigint	f_name character varying (20)	sec_name character varying (20)	id_order bigint	id_emp bigint	passport_num bigint	id_tour bigint
1	2	Ruslan	Borisov		1	2	832643
2	3	Diana	Kopkova		2	3	328464
3	2	Ruslan	Borisov		3	2	239465
4	4	Maria	Kuznetsova		4	4	233325
5	5	Aleksandr	Mironov		5	5	238453

4) select * from excursions natural join hotel

Query

Query History

1

select * from excursions natural join hotel

Data Output

Messages

Notifications

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	id_ex bigint	price double precision	id_hotel bigint	country character varying (50)	city character varying (100)	stars integer
1	1	7034	1	Russia	Bryansk	3
2	1	7034	2	USA	Columbus	4
3	1	7034	3	Island	Akureyri	4
4	1	7034	4	Belarus	Minsk	5
5	1	7034	5	Greece	Athens	4
6	1	7034	6	China	Beijing	5
7	2	223953	1	Russia	Bryansk	3
8	2	223953	2	USA	Columbus	4
9	2	223953	3	Island	Akureyri	4
10	2	223953	4	Belarus	Minsk	5
11	2	223953	5	Greece	Athens	4
12	2	223953	6	China	Beijing	5
13	3	3484.2	1	Russia	Bryansk	3
14	3	3484.2	2	USA	Columbus	4
15	3	3484.2	3	Island	Akureyri	4
16	3	3484.2	4	Belarus	Minsk	5
17	3	3484.2	5	Greece	Athens	4
18	3	3484.2	6	China	Beijing	5

5) select * from employees full outer join orders on employees.id_emp = orders.id_emp

Query

Query History

1

select * from employees full outer join orders on employees.id_emp = orders.id_emp

Data Output

Messages

Notifications

	id_emp bigint	f_name character varying (20)	sec_name character varying (20)	id_order bigint	id_emp bigint	passport_num bigint	id_tour bigint	
1		2 Ruslan	Borisov		1	2	832643	[null]
2		3 Diana	Kopkova		2	3	328464	[null]
3		2 Ruslan	Borisov		3	2	239465	[null]
4		4 Maria	Kuznetsova		4	4	233325	[null]
5		5 Aleksandr	Mironov		5	5	238453	[null]
6		6 Varvara	Kovaleva	[null]	[null]	[null]	[null]	[null]
7		1 Boris	Surikov	[null]	[null]	[null]	[null]	[null]

n.

```
with recursive g (id, rank_name, rank, path) as (
    select t1.id, t1.rank_name, t1.rank, cast (t1.rank_name as varchar) as path
    from ranked t1 where t1.rank_name = 'Бортрадист'
union
    select t2.id, t2.rank_name, t2.rank, cast (g.path || '->' || t2.rank_name as varchar)
    from ranked t2 join g on (g.rank = t2.id))
select id, rank_name, path from g
```

Query

Query History

```
1 with recursive g (id, rank_name, rank, path) as (  
2     select t1.id, t1.rank_name, t1.rank, cast (t1.rank_name as varchar) as path  
3     from ranked t1 where t1.rank_name = 'Бортрадист'  
4     union  
5     select t2.id, t2.rank_name, t2.rank, cast (g.path || '->' || t2.rank_name as varchar)  
6     from ranked t2 join g on (g.rank = t2.id))  
7     select id, rank_name, path from g
```

Data Output

Messages

Notifications

	id integer	rank_name character varying	path character varying
1	4	Бортрадист	Бортрадист
2	3	Штурман	Бортрадист->Штурман
3	2	Второй пилот	Бортрадист->Штурман->Второй пилот
4	1	Капитан	Бортрадист->Штурман->Второй пилот->Капитан