

МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РФ
ФГБОУ ВО «ВОРОНЕЖСКИЙ ГОСУДАРСТВЕННЫЙ
УНИВЕРСИТЕТ ИНЖЕНЕРНЫХ ТЕХНОЛОГИЙ»
БЕЗОПАСНОСТЬ СИСТЕМ БАЗ ДАННЫХ

ПРАКТИЧЕСКАЯ РАБОТА №4
ВАРИАНТ 8

ВЫПОЛНИЛА: КАНАРЯН АННА НИКОЛАЕВНА
ГРУППА: УБ-01
НОМЕР ЗАЧЕТНОЙ КНИЖКИ: 207367

ВОРОНЕЖ 2023

1. Создадим представление, которое будет выводить список имен студентов:

Scratch Pad × Query Query History ↗

```
1 CREATE VIEW StudentNameView AS
2 SELECT name AS StudentName
3 FROM students;
```

Scratch Pad × Query Query History

1
2

```
SELECT * FROM StudentNameView;
```

Data Output Messages Notifications

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	studentname character varying (100) 🔒
1	Katerina
2	Katerina
3	Marina

- Создадим представление, которое скроет все столбцы таблицы teachers, кроме фамилии, имени и номера телефона:

Scratch Pad × Query Query History



```
1 CREATE VIEW BasicTeacherData AS
2 SELECT surname, name, phone
3 FROM teachers;
4
5
6
7
8
```

Data Output Messages Notifications



CREATE VIEW

Query returned successfully in 315 msec.

Scratch Pad × Query Query History

1
2
3
4
5
6

SELECT * **FROM** BasicTeacherData;

Data Output Messages Notifications

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	surname character varying (100) 🔒	name character varying (100) 🔒	phone character varying (11) 🔒
1	Ivanova	Ivanka	88005553535
2	Ivanova	Ivanka	88005553535
3	Sidorova	Elena	89220001188

3. Отредактируем данное представление, чтобы оно выводило только учителей с фамилией Иванова:

Scratch Pad × Query Query History

```
1 CREATE VIEW BasicTeacherDataIvanova AS
2 SELECT surname, name, phone
3 FROM teachers
4 WHERE surname = 'Ivanova';
5
6
7
8
9
```

Data Output Messages Notifications

CREATE VIEW

Query returned successfully in 45 msec.

Scratch Pad × Query Query History

```
1 SELECT * FROM BasicTeacherDataIvanova;
2
3
4
5
```

Data Output Messages Notifications

	surname character varying (100) 🔒	name character varying (100) 🔒	phone character varying (11) 🔒
1	Ivanova	Ivanka	88005553535
2	Ivanova	Ivanka	88005553535

4. Создадим представление, которое выведет полное имя учителя:

Scratch Pad × Query Query History

```
1 CREATE VIEW TeacherName AS
2 SELECT (surname || ' ' || name AS FullName
3 FROM teachers;
```

Data Output Messages Notifications

CREATE VIEW

Query returned successfully in 95 msec.

Scratch Pad × Query Query History

```
1 SELECT * FROM TeacherName;
2
```

Data Output Messages Notifications

	fullname text
1	Ivanova Ivanka
2	Ivanova Ivanka
3	Sidorova Elena

5. Создадим хранимую процедуру, которая подсчитывает средний балл ученика по заданному предмету:

```

1 CREATE OR REPLACE FUNCTION avg_grade(
2   newstudent in int,
3   newsubject in int,
4   newsurname out char,
5   newname out char,
6   newsubject_name out char,
7   newgrade out int
8 )
9 as $avg_grade$
10 declare new_record record;
11 begin
12   for new_record in select students.surname, students.name, subjects.subjects_name, grades.grade
13   FROM students JOIN grades ON students.id = grades.student JOIN subjects ON grades.subject = subjects.id
14   WHERE students.id = newstudent AND subjects.id = newsubject
15 loop
16   newsurname := new_record.surname;
17   newname := new_record.name;
18   newsubject_name := new_record.subjects_name;
19   newgrade := new_record.grade;
20   raise notice '% % has % average score on the subject %', newsurname, newname, newgrade, newsubject_name;
21 end loop;
22 end;
23 $avg_grade$ language plpgsql;
24

```

Data Output Messages Notifications

CREATE FUNCTION

Query returned successfully in 97 msec.

```

1 select avg_grade(1,2);
2

```

Data Output Messages Notifications

ЗАМЕЧАНИЕ: Lavskaya Katerina has 5 average score on the subject Math

6. Создадим триггер, который будет выполняться при удалении ученика из таблицы students и удалять все его оценки из таблицы grades.


```
Scratch Pad × Query Query History
1 CREATE OR REPLACE FUNCTION delete_student_grades() RETURNS TRIGGER AS $$
2 BEGIN
3     DELETE FROM grades WHERE student = OLD.id;
4     RETURN OLD;
5 END;
6 $$ LANGUAGE plpgsql;
7
8 CREATE TRIGGER student_delete_trigger
9     AFTER DELETE ON students
10    FOR EACH ROW
11    EXECUTE FUNCTION delete_student_grades();

Data Output Messages Notifications
CREATE TRIGGER
Query returned successfully in 113 msec.
```

Триггер запускается автоматически.

7. Получим имя текущей базы данных

```
1 SELECT * FROM information_schema.information_schema_catalog_name;
```

Data Output Messages Notifications

	catalog_name name
1	the_school

8. Получим список ограничений

1 **SELECT** * **FROM** information_schema.table_constraints;

Data Output Messages Notifications

	constraint_catalog name	constraint_schema name	constraint_name name	table_catalog name	table_schema name	table_name name
1	the_school	pg_catalog	pg_proc_oid_index	the_school	pg_catalog	pg_proc
2	the_school	pg_catalog	pg_proc_proname_args_nsp_index	the_school	pg_catalog	pg_proc
3	the_school	pg_catalog	pg_type_oid_index	the_school	pg_catalog	pg_type
4	the_school	pg_catalog	pg_type_typname_nsp_index	the_school	pg_catalog	pg_type
5	the_school	pg_catalog	pg_attribute_relid_attnam_index	the_school	pg_catalog	pg_attribute
6	the_school	pg_catalog	pg_attribute_relid_attnum_index	the_school	pg_catalog	pg_attribute
7	the_school	pg_catalog	pg_class_oid_index	the_school	pg_catalog	pg_class
8	the_school	pg_catalog	pg_class_relname_nsp_index	the_school	pg_catalog	pg_class
9	the_school	pg_catalog	pg_attrdef_adrelid_adnum_index	the_school	pg_catalog	pg_attrdef
10	the_school	pg_catalog	pg_attrdef_oid_index	the_school	pg_catalog	pg_attrdef
11	the_school	pg_catalog	pg_constraint_conrelid_contypid_conname_index	the_school	pg_catalog	pg_constraint
12	the_school	pg_catalog	pg_constraint_oid_index	the_school	pg_catalog	pg_constraint
13	the_school	pg_catalog	pg_index_relid_scan_index	the_school	pg_catalog	pg_index

9. Получим список последовательностей

1

SELECT * FROM information_schema.sequences;

Data Output

Messages

Notifications

	sequence_catalog name	sequence_schema name	sequence_name name	data_type character varying	numeric_precision integer	numeric_precision_radix integer	numeric_scale integer	start_value character varying	minimum_value character varying	maximum_value character varying	increment character
1	the_school	public	seq_teachers_id	bigint	64	2	0 1	1	1	9223372036854775807	1
2	the_school	public	seq_subjects_id	bigint	64	2	0 1	1	1	9223372036854775807	1
3	the_school	public	seq_students_id	bigint	64	2	0 1	1	1	9223372036854775807	1
4	the_school	public	seq_grades_id	bigint	64	2	0 1	1	1	9223372036854775807	1
5	the_school	public	seq_classes_id	bigint	64	2	0 1	1	1	9223372036854775807	1

10. Получим список таблиц

1

SELECT * FROM information_schema.tables;

Data Output

Messages

Notifications

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	table_catalog name	table_schema name	table_name name	table_type character varying
1	the_school	public	subjects	BASE TABLE
2	the_school	public	teachers	BASE TABLE
3	the_school	public	students	BASE TABLE
4	the_school	public	grades	BASE TABLE
5	the_school	public	classes	BASE TABLE
6	the_school	public	studentnameview	VIEW