

The background is a light gray color, decorated with various abstract geometric shapes and patterns. These include: a black wavy line at the top left; a black circle with a red outline on the left; a large cyan diamond in the center-left; a small black diamond below it; a black wavy line at the bottom left; a red wavy line on the right; a black circle with a cyan outline at the bottom right; a black dotted line at the top right; a red dotted line at the bottom right; a black 'X' shape with a cyan outline at the top center; a red 'X' shape with a black outline at the bottom center; a black 'X' shape with a red outline at the top right; and a cyan 'X' shape with a black outline at the bottom left.

Политика защиты строк

Выполнил студент 2ИСиП-19-1

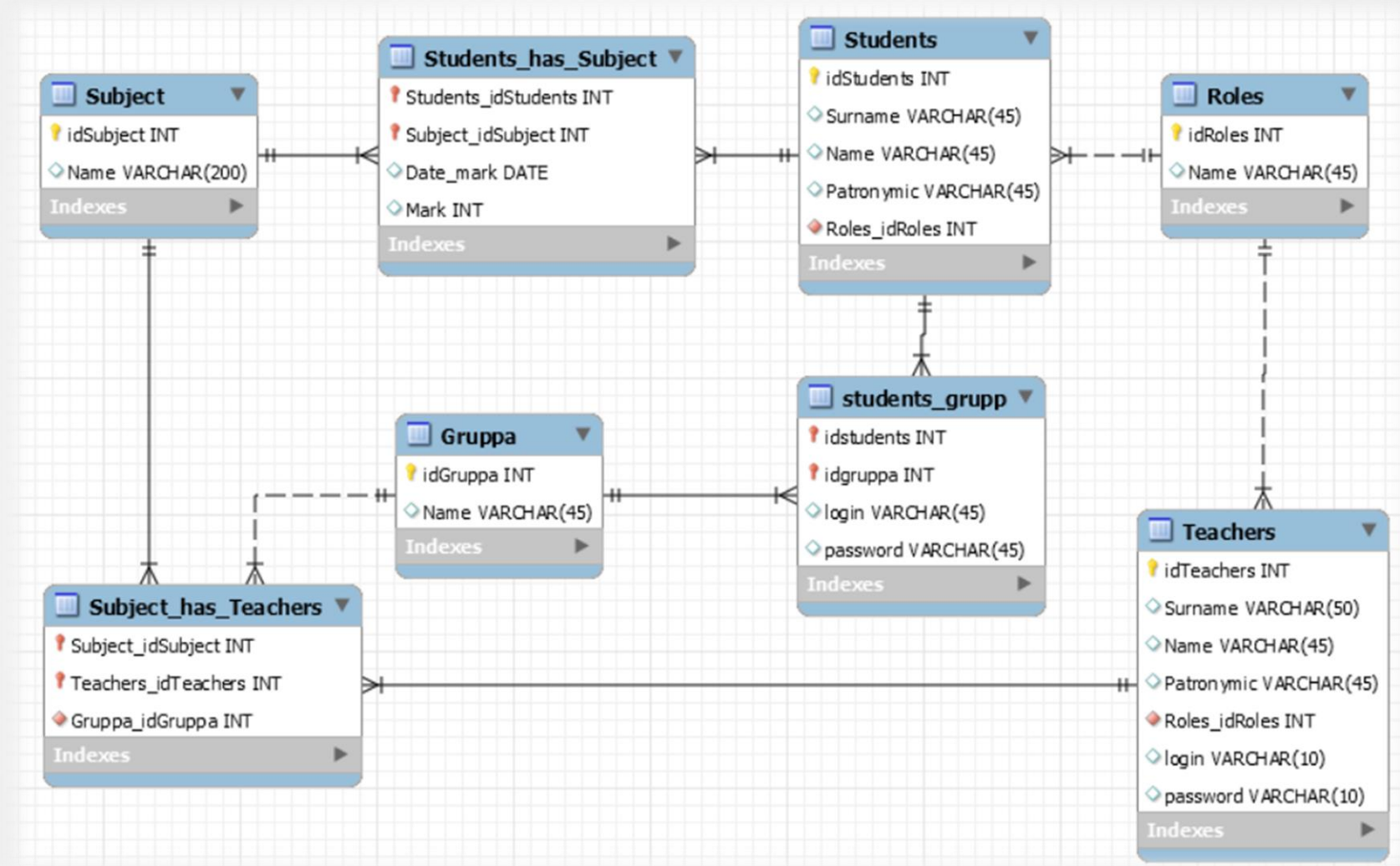
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Задача работы:

Применить на практике изученные возможности ограничений прав на уровне строк и познакомиться с их особенностями.

Структура базы данных



Создание ролей и выдача прав

```
postgres=# create role student;  
postgres=# grant select on students_has_subject, students, subject, teachers, gruppa to student;  
GRANT  
postgres=# create role teacher;  
CREATE ROLE  
postgres=# grant insert, update, delete on students_has_subject to teacher;  
GRANT  
postgres=# grant select on students, teachers, gruppa, roles, students_grupp,  
students_has_subject, subject, subject_has_teachers to teacher;  
GRANT
```

Создание пользователей

```
postgres=# create role mish_gal with login password '123' in role student;  
CREATE ROLE  
postgres=# create role reve with login password 'qwerty' in role student;  
CREATE ROLE  
postgres=# create role elena with login password 'elodin' in role teacher;  
CREATE ROLE  
postgres=# create role marina with login password '0987' in role teacher;  
CREATE ROLE  
postgres=#
```

Политика для student

```
create policy stud_mark on students_has_subject to
student using (students_idstudents in (select
idstudents from students_grupp where login =
current_user));
```

```
postgres=# create policy stud_mark on students_has_subject to student using (students_idstudents
in (select idstudents from students_grupp where login = current_user));
CREATE POLICY
```

Политика для student

create policy grup_check on students to student
using (idstudents in (select idstudents from
students_grupp where idgruppa = (select idgruppa
from students_grupp where login = current_user)));

```
postgres=# create policy grup_check on students to student using (idstudents in  
(select idstudents from students_grupp where idgruppa = (select idgruppa from  
students_grupp where login = current_user)));  
CREATE POLICY
```


Политика для teachers

create policy teach_mark on students_has_subject to teacher using
(subject_idsubject in (select subject_idsubject from subject_has_teachers s,
teachers te where te.login = current_user and s.teachers_idteachers =
te.idteachers) and students_idstudents in (select idstudents from students_grupp
where idgruppa in (select idgruppa from gruppa where idgruppa in (select
gruppa_idgruppa from subject_has_teachers sht, teachers te where
sht.teachers_idteachers = te.idteachers and te.login = current_user))));

```
postgres=# create policy teach_mark on students_has_subject to teacher using (subject_idsubject in  
(select subject_idsubject from subject_has_teachers s, teachers te where te.login = current_user  
and s.teachers_idteachers = te.idteachers) and students_idstudents in (select idstudents from stud  
ents_grupp where idgruppa in (select idgruppa from gruppa where idgruppa in (select gruppa_idgrup  
pa from subject_has_teachers sht, teachers te where sht.teachers_idteachers = te.idteachers and te  
.login = current_user))));  
CREATE POLICY
```


Заполнение базы данных

```
postgres=# insert into roles
postgres-# values (1, 'Student'), (2, 'Teacher')
postgres-# ;
INSERT 0 2
```

```
postgres=# insert into gruppa
postgres-# values (1, '1ИСиП-19-1'), (2, '2ИСиП-19-1');
INSERT 0 2
```

```
postgres=# insert into students
postgres-# values (1, 'Галустян', 'Михаил', 'Петрович', 1, 1, 'mish_gal', '123'),
postgres-#      (2, 'Рева', 'Алексадр', 'Николаевич', 1, 2, 'reva', 'qwerty');
INSERT 0 2
```

```
postgres=# insert into subject
postgres-# values (1, 'Математика'), (2, 'Физика'), (3, 'Информатика');
INSERT 0 3
```

```
postgres=# insert into teachers
postgres-# values (1, 'Одинцова', 'Елена', 'Сергеевна', 2, 'elena', 'elodin'),
postgres-#      (2, 'Рябова', 'Марина', 'Николаевна', 2, 'marina', '0987');
INSERT 0 2
```

```
postgres=# insert into students_has_subject
postgres-# values (1, 1, '2021-04-01', 3), (1, 2, '2021-04-02', 5), (2, 1, '2021-04-03', 4),
postgres-#      (2, 2, '2021-04-04', 5);
INSERT 0 4
```

```
postgres=# insert into subject_has_teachers
postgres-# values (1, 1, 1), (2,2,1), (3,1,2), (1,2,2);
INSERT 0 4
```

Включение защиты на уровне строк

```
postgres=# alter table students enable row level security;  
ALTER TABLE  
postgres=# alter table students_has_subject enable row level security;  
ALTER TABLE
```

Проверка student

```
postgres=# \c - reve
Пароль пользователя reve:
Вы подключены к базе данных "postgres" как пользователь "reve".
postgres=> select * from students_has_subject;
 students_idstudents | subject_idsubject | date_mark | mark
-----+-----+-----+-----
                2 |                1 | 2021-04-03 |    4
                2 |                2 | 2021-04-04 |    5
(2 строки)
```

```
postgres=> \c - baskov
Пароль пользователя baskov:
Вы подключены к базе данных "postgres" как пользователь "baskov".
postgres=> select * from students_has_subject;
 students_idstudents | subject_idsubject | date_mark | mark
-----+-----+-----+-----
(0 строк)
```

Проверка student

```
postgres=# \c - reve
Пароль пользователя reve:
Вы подключены к базе данных "postgres" как пользователь "reve".
postgres=> select * from students;
 idstudents | surname | name   | patronymic | roles_idroles
-----+-----+-----+-----+-----
          1 | Галустян | Михаил | Андреевич |          1
          2 | Рева    | Александр | Николаевич |          1
(2 строки)
```



```
postgres=> \c - baskov
Пароль пользователя baskov:
Вы подключены к базе данных "postgres" как пользователь "baskov".
postgres=> select * from students;
 idstudents | surname | name   | patronymic | roles_idroles
-----+-----+-----+-----+-----
          3 | Басков  | Николай | Денисович |          1
(1 строка)
```

Проверка teacher

```
postgres=> \c - elena
Пароль пользователя elena:
Вы подключены к базе данных "postgres" как пользователь "elena".
postgres=> select * from students_has_subject;
 students_idstudents | subject_idsubject | date_mark | mark
-----+-----+-----+-----
                3 |                3 | 2021-04-07 |    2
(1 строка)
```



```
postgres=> \c - marina
Пароль пользователя marina:
Вы подключены к базе данных "postgres" как пользователь "marina".
postgres=> select * from students_has_subject;
 students_idstudents | subject_idsubject | date_mark | mark
-----+-----+-----+-----
                1 |                2 | 2021-04-02 |    5
                2 |                2 | 2021-04-04 |    5
(2 строки)
```

Таблица прав доступа

Схема	Имя	Тип	Права доступа	Права для столбцов	Права доступа	Политики
public	gruppa	таблица	postgres=arwdDxt/postgres+			
public	roles	таблица	postgres=arwdDxt/postgres+			
public	students	таблица	postgres=arwdDxt/postgres+		grup_check:	
			student=r/postgres	+	(u): (idstudents IN (SELECT students_grupp.idstudents	
			teacher=r/postgres	+	FROM students_grupp	
				+	WHERE (students_grupp.idgruppa = (SELECT students_grupp_1.idgruppa	
				+	FROM students_grupp students_grupp_1	
				+	WHERE ((students_grupp_1.login)::text = CURRENT_USER))))	
				+	to: student	
public	students_grupp	таблица	postgres=arwdDxt/postgres+			
			student=r/postgres	+		
			teacher=r/postgres			
public	students_has_subject	таблица	student=r/postgres	+	stud_mark:	
			teacher=arwd/postgres		(u): (students_idstudents IN (SELECT students_grupp.idstudents	
				+	FROM students_grupp	
				+	WHERE ((students_grupp.login)::text = CURRENT_USER)))	
				+	to: student	

Таблица прав доступа

				teach_mark:
			+	
			+	(u): ((subject_idsubject IN (SELECT s.subject_idsubject
			+	FROM subject_has_teachers s,
			+	teachers te
students_idstudents IN (SELECT students_grupp.idstudents+				WHERE (((te.login)::text = CURRENT_USER) AND (s.teachers_idteachers = te.idteachers)))) AND (st
			+	FROM students_grupp
			+	WHERE (students_grupp.idgruppa IN (SELECT gruppa.idgruppa
			+	FROM gruppa
			+	WHERE (gruppa.idgruppa IN (SELECT sht.gruppa_idgruppa
			+	FROM subject_has_teachers sht,
			+	teachers te
			+	WHERE ((sht.teachers_idteachers = te.idteachers) AND ((te.login)::text = CURREN
T_USER))))))))			+	
public	subject	таблица	postgres=arwdDxt/postgres+ student=r/postgres +	to: teacher
public	subject_has_teachers	таблица	postgres=arwdDxt/postgres+ teacher=r/postgres	
public	teachers	таблица	postgres=arwdDxt/postgres+ student=r/postgres + teacher=r/postgres	
(8 строк)				