**Описание базы данных (далее - БД)**

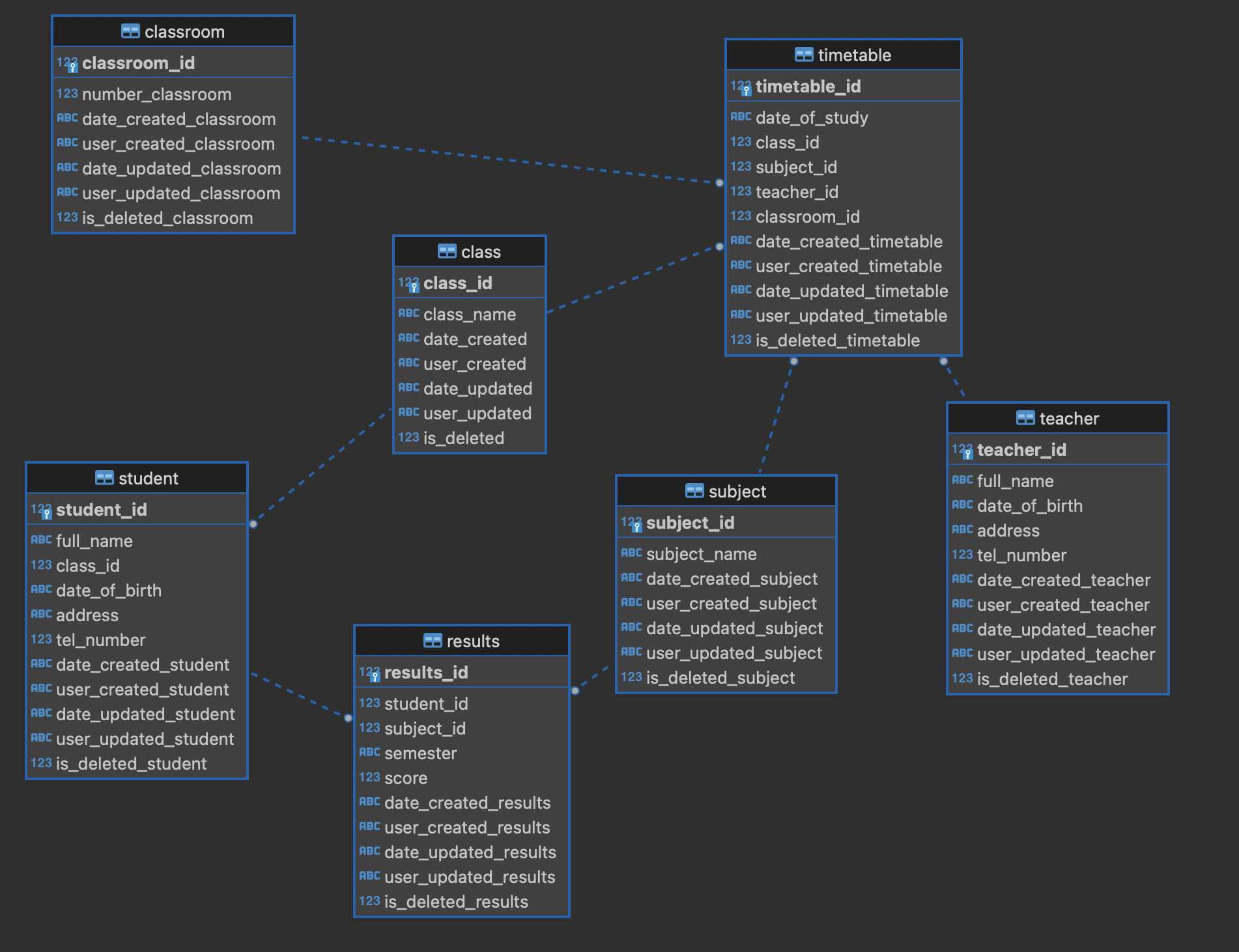
В данной БД раскрыта следующая информация:

* об учениках (их ФИО, дата рождения, класс, адрес проживания, номер телефона, успеваемость);
* об учителях (их ФИО, дата рождения, адрес проживания, номер телефона, предмет, который он ведет);
* актуальное расписание (дата, номер кабинета и т. д.).

В описании вы можете ознакомиться со структурированным описанием сущностей и атрибутов БД, ER-диаграммой и связями между таблицами. Так же, представлен код БД, код триггеров БД, а также запросы для проверки БД с кодами и скриншотами их отработки и отработки триггеров.

|  |  |  |  |
| --- | --- | --- | --- |
| **Структурированное описание атрибутов и сущностей** | | | |
| Class - класс | | | |
| Название | Ключ | Тип данных | Описание |
| Class\_id | PK | INTEGER | Уникальный ID класса |
| Class\_name |  | VARCHAR (10) | Название класса |
| Date\_created |  | DATETIME | Дата создания записи |
| User\_created |  | VARCHAR (50) | ФИО создателя записи |
| Date\_updated |  | DATETIME | Дата обновления записи |
| User\_updated |  | VARCHAR (50) | ФИО обновляющего запись |
| Is\_deleted |  | BOOLEAN | Актуальность записи |
|  |  |  |  |
| Student – ученик | | | |
| Название | Ключ | Тип данных | Описание |
| Student\_id | PK | INTEGER | Уникальный ID ученика школы |
| Full\_name |  | VARCHAR(30) | ФИО |
| Class\_id | FK | INTEGER | Уникальный ID класса |
| Date\_of\_birth |  | DATE | Дата рождения |
| Address |  | VARCHAR (100) | Адрес проживания |
| Tel\_number |  | INTEGER | Номер телефона |
| Date\_created\_student |  | DATETIME | Дата создания записи |
| User\_created\_student |  | VARCHAR (50) | ФИО создателя записи |
| Date\_update\_student |  | DATETIME | Дата обновления записи |
| User\_update\_student |  | VARCHAR (50) | ФИО обновляющего запись |
| Is\_deleted\_student |  | BOOLEAN | Актуальность записи |
|  |  |  |  |
|  |  |  |  |
| Subject – урок | | | |
| Название | Ключ | Тип данных | Описание |
| Subject\_id | PK | INTEGER | Уникальный ID урока |
| Subject\_name |  | VARCHAR (20) | Название урока |
| Date\_created\_subject |  | DATETIME | Дата создания записи |
| User\_created\_subject |  | VARCHAR (50) | ФИО создателя записи |
| Date\_updated\_subject |  | DATETIME | Дата обновления записи |
| User\_updated\_subject |  | VARCHAR (50) | ФИО обновляющего запись |
| Is\_deleted\_subject |  | BOOLEAN | Актуальность записи |
|  |  |  |  |
| Results – оценки | | | |
| Название | Ключ | Тип данных | Описание |
| Results\_id | PK | INTEGER | Уникальный ID оценки |
| Student\_id | FK | INTEGER | Уникальный ID ученика |
| Subject\_id | FK | INTEGER | Уникальный ID урока |
| Semester |  | VARCHAR (10) | Учебный семестр |
| Score |  | INTEGER | Оценка |
| Date\_created\_results |  | DATETIME | Дата создания записи |
| User\_created\_results |  | VARCHAR (50) | ФИО создателя записи |
| Date\_updated\_results |  | DATETIME | Дата обновления записи |
| User\_updated\_results |  | VARCHAR (50) | ФИО обновляющего запись |
| Is\_deleted\_results |  | BOOLEAN | Актуальность записи |
|  |  |  |  |
| Teacher - учитель | | | |
| Название | Ключ | Тип данных | Описание |
| Teacher\_id | PK | INTEGER | Уникальный ID учителя |
| Full\_name |  | VARCHAR (50) | ФИО |
| Date\_of\_Birth |  | DATE | Дата рождения |
| Adress |  | VARCHAR (100) | Адрес проживания |
| Tel\_number |  | INTEGER | Номер телефона |
| Date\_created\_teacher |  | DATETIME | Дата создания записи |
| User\_created\_teacher |  | VARCHAR (50) | ФИО создателя записи |
| Date\_updated\_teacher |  | DATETIME | Дата обновления записи |
| User\_updated\_teacher |  | VARCHAR (50) | ФИО обновляющего запись |
| Is\_deleted\_teacher |  | BOOLEAN | Актуальность записи |
|  |  |  |  |
| Classroom – кабинет | | | |
| Название | Ключ | Тип данных | Описание |
| Classroom\_id | PK | INTEGER | Уникальный ID кабинета |
| Numder\_classroom |  | INTEGER | Номер кабинета |
| Date\_created\_classroom |  | DATETIME | Дата создания записи |
| User\_created\_classroom |  | VARCHAR (50) | ФИО создателя записи |
| Date\_updated\_classroom |  | DATETIME | Дата обновления записи |
| User\_updated\_classroom |  | VARCHAR (50) | ФИО обновляющего запись |
| Is\_deleted\_classroom |  | BOOLEAN | Актуальность записи |
|  |  |  |  |
| Timetable - расписание | | | |
| Название | Ключ | Тип данных | Описание |
| Timetable\_id | PK | INTEGER | Уникальный ID расписания |
| Date\_of\_study |  | DATE | Дата расписания |
| Class\_id | FK | INTEGER | Уникальный ID класса |
| Subject\_id | FK | INTEGER | Уникальный ID урока |
| Teacher\_id | FK | INTEGER | Уникальный ID учителя |
| Classroom\_id | FK | INTEGER | Уникальный ID кабинета |
| Date\_created\_timetable |  | DATETIME | Дата создания записи |
| User\_created\_timetable |  | VARCHAR (50) | ФИО создателя записи |
| Date\_updated\_timetable |  | DATETIME | Дата обновления записи |
| User\_updated\_timetable |  | VARCHAR (50) | ФИО обновляющего запись |
| Is\_deleted\_timetable |  | BOOLEAN | Актуальность записи |

ER диаграмма



Код БД:

**CREATE** **TABLE** class (

class\_id **INTEGER** **PRIMARY** **KEY** **AUTOINCREMENT**,

class\_name **VARCHAR** (10) **NOT** **NULL**

, date\_created **DATETIME**, user\_created **VARCHAR**(50), date\_updated **DATETIME**, user\_updated **VARCHAR**(50), is\_deleted **BOOLEAN**);

**CREATE** **TABLE** classroom (

classroom\_id **INTEGER** **PRIMARY** **KEY** **AUTOINCREMENT**,

number\_classroom **INTEGER** **NOT** **NULL**

, date\_created\_classroom **DATETIME**, user\_created\_classroom **VARCHAR**(50), date\_updated\_classroom **DATETIME**, user\_updated\_classroom **VARCHAR**(50), is\_deleted\_classroom **BOOLEAN**);

**CREATE** **TABLE** results (

results\_id **INTEGER** **PRIMARY** **KEY** **AUTOINCREMENT**,

student\_id **INTEGER** **NOT** **NULL**,

subject\_id **INTEGER** **NOT** **NULL**,

semester **VARCHAR** (10),

score **INTEGER**, date\_created\_results **DATETIME**, user\_created\_results **VARCHAR**(50), date\_updated\_results **DATETIME**, user\_updated\_results **VARCHAR**(50), is\_deleted\_results **BOOLEAN**,

**FOREIGN** **KEY** (student\_id) **REFERENCES** student(student\_id),

**FOREIGN** **KEY** (subject\_id) **REFERENCES** subject(subject\_id)

);

**CREATE** **TABLE** student (

student\_id **INTEGER** **PRIMARY** **KEY** **AUTOINCREMENT**,

full\_name **VARCHAR** (30) **NOT** **NULL**,

class\_id **INTEGER** **NOT** **NULL**,

date\_of\_birth **DATE** **NOT** **NULL**,

address **VARCHAR** (100) **NOT** **NULL**,

tel\_number **INTEGER** **NOT** **NULL**, date\_created\_student **DATETIME**, user\_created\_student **VARCHAR**(50), date\_updated\_student **DATETIME**, user\_updated\_student **VARCHAR**(50), is\_deleted\_student **BOOLEAN**,

**FOREIGN** **KEY** (class\_id) **REFERENCES** class(class\_id)

);

**CREATE** **TABLE** subject (

subject\_id **INTEGER** **PRIMARY** **KEY** **AUTOINCREMENT**,

subject\_name **VARCHAR** (50) **NOT** **NULL**

, date\_created\_subject **DATETIME**, user\_created\_subject **VARCHAR**(50), date\_updated\_subject **DATETIME**, user\_updated\_subject **VARCHAR**(50), is\_deleted\_subject **BOOLEAN**);

**CREATE** **TABLE** teacher (

teacher\_id **INTEGER** **PRIMARY** **KEY** **AUTOINCREMENT**,

full\_name **VARCHAR** (50) **NOT** **NULL**,

date\_of\_birth **DATE** **NOT** **NULL**,

address **VARCHAR** (100) **NOT** **NULL**,

tel\_number **INTEGER** **NOT** **NULL**

, date\_created\_teacher **DATETIME**, user\_created\_teacher **VARCHAR**(50), date\_updated\_teacher **DATETIME**, user\_updated\_teacher **VARCHAR**(50), is\_deleted\_teacher **BOOLEAN**);

**CREATE** **TABLE** timetable (

timetable\_id **INTEGER** **PRIMARY** **KEY** **AUTOINCREMENT**,

date\_of\_study **DATE** **NOT** **NULL**,

class\_id **INTEGER** **NOT** **NULL**,

subject\_id **INTEGER** **NOT** **NULL**,

teacher\_id **INTEGER** **NOT** **NULL**,

classroom\_id **INTEGER** **NOT** **NULL**, date\_created\_timetable **DATETIME**, user\_created\_timetable **VARCHAR**(50), date\_updated\_timetable **DATETIME**, user\_updated\_timetable **VARCHAR**(50), is\_deleted\_timetable **BOOLEAN**,

**FOREIGN** **KEY** (class\_id) **REFERENCES** class(class\_id),

**FOREIGN** **KEY** (subject\_id) **REFERENCES** subject(subject\_id)

**FOREIGN** **KEY** (teacher\_id) **REFERENCES** teacher(teacher\_id),

**FOREIGN** **KEY** (classroom\_id) **REFERENCES** classroom (classroom\_id)

);

Код триггеров БД:

**CREATE** **TRIGGER** set\_date\_created **AFTER** **INSERT**

**ON** class

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_created **IS** **NULL**)

**BEGIN**

**UPDATE** class **SET** date\_created = **DATETIME**('now') **WHERE** class\_id = **NEW**.class\_id;

**END**;

**CREATE** **TRIGGER** set\_date\_updated **AFTER** **UPDATE** **OF** class\_name

**ON** class

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_updated **IS** **NULL**)

**BEGIN**

**UPDATE** class **SET** date\_updated = **DATETIME**('now') **WHERE** class\_name = **NEW**.class\_name;

**END**;

**CREATE** **TRIGGER** set\_is\_deleted **AFTER** **DELETE**

**ON** class

**FOR** **EACH** **ROW**

**BEGIN**

**INSERT** **INTO** class (class\_id, class\_name, date\_created, user\_created, date\_updated, user\_updated, is\_deleted)

**VALUES** (**OLD**.class\_id, **OLD**.class\_name, **OLD**.date\_created, **OLD**.user\_created, **OLD**.date\_updated, **OLD**.user\_updated, **True**);

**END**;

**CREATE** **TRIGGER** set\_user\_created **AFTER** **INSERT**

**ON** class

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_created **IS** **NULL**)

**BEGIN**

**UPDATE** class **SET** user\_created = 'teacher' **WHERE** class\_id = **NEW**.class\_id;

**END**;

**CREATE** **TRIGGER** set\_user\_updated **AFTER** **UPDATE** **OF** class\_name

**ON** class

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_updated **IS** **NULL**)

**BEGIN**

**UPDATE** class **SET** user\_updated = 'expert' **WHERE** class\_name = **NEW**.class\_name;

**END**;

**CREATE** **TRIGGER** set\_date\_created\_classroom **AFTER** **INSERT**

**ON** classroom

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_created\_classroom **IS** **NULL**)

**BEGIN**

**UPDATE** classroom **SET** date\_created\_classroom = **DATETIME**('now') **WHERE** classroom\_id = **NEW**.classroom\_id;

**END**;

**CREATE** **TRIGGER** set\_date\_updated\_classroom **AFTER** **UPDATE** **OF** number\_classroom

**ON** classroom

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_updated\_classroom **IS** **NULL**)

**BEGIN**

**UPDATE** classroom **SET** date\_updated\_classroom = **DATETIME**('now') **WHERE** number\_classroom = **NEW**.number\_classroom;

**END**;

**CREATE** **TRIGGER** set\_is\_deleted\_classroom **AFTER** **DELETE**

**ON** classroom

**FOR** **EACH** **ROW**

**BEGIN**

**INSERT** **INTO** classroom (classroom\_id, number\_classroom, date\_created\_classroom, user\_created\_classroom, date\_updated\_classroom, user\_updated\_classroom, is\_deleted\_classroom)

**VALUES** (**OLD**.classroom\_id, **OLD**.number\_classroom, **OLD**.date\_created\_classroom, **OLD**.user\_created\_classroom, **OLD**.date\_updated\_classroom, **OLD**.user\_updated\_classroom, **True**);

**END**;

**CREATE** **TRIGGER** set\_user\_created\_classroom **AFTER** **INSERT**

**ON** classroom

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_created\_classroom **IS** **NULL**)

**BEGIN**

**UPDATE** classroom **SET** user\_created\_classroom = 'teacher' **WHERE** classroom\_id = **NEW**.classroom\_id;

**END**;

**REATE** **TRIGGER** set\_user\_updated\_classroom **AFTER** **UPDATE** **OF** number\_classroom

**ON** classroom

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_updated\_classroom **IS** **NULL**)

**BEGIN**

**UPDATE** classroom **SET** user\_updated\_classroom = 'expert' **WHERE** number\_classroom = **NEW**.number\_classroom;

**END**;

**CREATE** **TRIGGER** set\_date\_created\_results **AFTER** **INSERT**

**ON** results

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_created\_results **IS** **NULL**)

**BEGIN**

**UPDATE** results **SET** date\_created\_results = **DATETIME**('now') **WHERE** results\_id = **NEW**.results\_id;

**END**;

**CREATE** **TRIGGER** set\_date\_updated\_results **AFTER** **UPDATE** **OF** student\_id, subject\_id, semester, score

**ON** results

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_updated\_results **IS** **NULL**)

**BEGIN**

**UPDATE** results **SET** date\_updated\_results = **DATETIME**('now') **WHERE** student\_id = **NEW**.student\_id **OR** subject\_id = **NEW**.subject\_id **OR** semester = **NEW**.semester **OR** score = **NEW**.score;

**END**;

**CREATE** **TRIGGER** set\_is\_deleted\_results **AFTER** **DELETE**

**ON** results

**FOR** **EACH** **ROW**

**BEGIN**

**INSERT** **INTO** results (results\_id, student\_id, subject\_id, semester, score, date\_created\_results, user\_created\_results, date\_updated\_results, user\_updated\_results, is\_deleted\_results)

**VALUES** (**OLD**.results\_id, **OLD**.student\_id, **OLD**.subject\_id, **OLD**.semester, **OLD**.score, **OLD**.date\_created\_results, **OLD**.user\_created\_results, **OLD**.date\_updated\_results, **OLD**.user\_updated\_results, **True**);

**END**;

**CREATE** **TRIGGER** set\_user\_created\_results **AFTER** **INSERT**

**ON** results

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_created\_results **IS** **NULL**)

**BEGIN**

**UPDATE** results **SET** user\_created\_results = 'teacher' **WHERE** results\_id = **NEW**.results\_id;

**END**;

**CREATE** **TRIGGER** set\_user\_updated\_results **AFTER** **UPDATE** **OF** semester, score

**ON** results

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_updated\_results **IS** **NULL**)

**BEGIN**

**UPDATE** results **SET** user\_updated\_results = 'expert' **WHERE** semester = **NEW**.semester **OR** score = **NEW**.score;

**END**;

**CREATE** **TRIGGER** set\_date\_created\_subject **AFTER** **INSERT**

**ON** subject

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_created\_subject **IS** **NULL**)

**BEGIN**

**UPDATE** subject **SET** date\_created\_subject = **DATETIME**('now') **WHERE** subject\_id = **NEW**.subject\_id;

**END**;

**CREATE** **TRIGGER** set\_date\_updated\_subject **AFTER** **UPDATE** **OF** subject\_name

**ON** subject

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_updated\_subject **IS** **NULL**)

**BEGIN**

**UPDATE** subject **SET** date\_updated\_subject = **DATETIME**('now') **WHERE** number\_subject = **NEW**.number\_subject;

**END**;

**CREATE** **TRIGGER** set\_is\_deleted\_subject **AFTER** **DELETE**

**ON** subject

**FOR** **EACH** **ROW**

**BEGIN**

**INSERT** **INTO** subject (subject\_id, subject\_name, date\_created\_subject, user\_created\_subject, date\_updated\_subject, user\_updated\_subject, is\_deleted\_subject)

**VALUES** (**OLD**.subject\_id, **OLD**.subject\_name, **OLD**.date\_created\_subject, **OLD**.user\_created\_subject, **OLD**.date\_updated\_subject, **OLD**.user\_updated\_subject, **True**);

**END**;

**CREATE** **TRIGGER** set\_user\_created\_subject **AFTER** **INSERT**

**ON** subject

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_created\_subject **IS** **NULL**)

**BEGIN**

**UPDATE** subject **SET** user\_created\_subject = 'teacher' **WHERE** subject\_id = **NEW**.subject\_id;

**END**;

**CREATE** **TRIGGER** set\_user\_updated\_subject **AFTER** **UPDATE** **OF** subject\_name

**ON** subject

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_updated\_subject **IS** **NULL**)

**BEGIN**

**UPDATE** subject **SET** user\_updated\_subject = 'expert' **WHERE** subject\_name = **NEW**.subject\_name;

**END**;

**CREATE** **TRIGGER** set\_date\_created\_teacher **AFTER** **INSERT**

**ON** teacher

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_created\_teacher **IS** **NULL**)

**BEGIN**

**UPDATE** teacher **SET** date\_created\_teacher = **DATETIME**('now') **WHERE** teacher\_id = **NEW**.teacher\_id;

**END**;

**CREATE** **TRIGGER** set\_date\_updated\_teacher **AFTER** **UPDATE** **OF** full\_name, date\_of\_birth, address, tel\_number

**ON** teacher

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_updated\_teacher **IS** **NULL**)

**BEGIN**

**UPDATE** teacher **SET** date\_updated\_teacher = **DATETIME**('now') **WHERE** full\_name = **NEW**.full\_name **OR** date\_of\_birth = **NEW**.date\_of\_birth **OR** address = **NEW**.address **OR** tel\_number = **NEW**.tel\_number;

**END**;

**CREATE** **TRIGGER** set\_is\_deleted\_teacher **AFTER** **DELETE**

**ON** teacher

**FOR** **EACH** **ROW**

**BEGIN**

**INSERT** **INTO** teacher (teacher\_id, full\_name, date\_of\_birth, address, tel\_number, date\_created\_teacher, user\_created\_teacher, date\_updated\_teacher, user\_updated\_teacher, is\_deleted\_teacher)

**VALUES** (**OLD**.teacher\_id, **OLD**.full\_name, **OLD**.date\_of\_birth, **OLD**.address, **OLD**.tel\_number, **OLD**.date\_created\_teacher, **OLD**.user\_created\_teacher, **OLD**.date\_updated\_teacher, **OLD**.user\_updated\_teacher, **True**);

**END**;

**CREATE** **TRIGGER** set\_user\_created\_teacher **AFTER** **INSERT**

**ON** teacher

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_created\_teacher **IS** **NULL**)

**BEGIN**

**UPDATE** teacher **SET** user\_created\_teacher = 'teacher' **WHERE** teacher\_id = **NEW**.teacher\_id;

**END**;

**CREATE** **TRIGGER** set\_user\_updated\_teacher **AFTER** **UPDATE** **OF** full\_name, date\_of\_birth, address, tel\_number

**ON** teacher

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_updated\_teacher **IS** **NULL**)

**BEGIN**

**UPDATE** teacher **SET** user\_updated\_teacher = 'expert' **WHERE** full\_name = **NEW**.full\_name **OR** date\_of\_birth = **NEW**.date\_of\_birth **OR** address = **NEW**.address **OR** tel\_number = **NEW**.tel\_number;

**END**;

**CREATE** **TRIGGER** set\_date\_created\_timetable **AFTER** **INSERT**

**ON** timetable

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_created\_timetable **IS** **NULL**)

**BEGIN**

**UPDATE** timetable **SET** date\_created\_timetable = **DATETIME**('now') **WHERE** timetable\_id = **NEW**.timetable\_id;

**END**;

**CREATE** **TRIGGER** set\_date\_updated\_timetable **AFTER** **UPDATE** **OF** date\_of\_study, class\_id, subject\_id, teacher\_id, classroom\_id

**ON** timetable

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_updated\_timetable **IS** **NULL**)

**BEGIN**

**UPDATE** timetable **SET** date\_updated\_timetable = **DATETIME**('now') **WHERE** date\_of\_study = **NEW**.date\_of\_study **OR** class\_id = **NEW**.class\_id **OR** subject\_id = **NEW**.subject\_id **OR** teacher\_id = **NEW**.teacher\_id **OR** classroom\_id = **NEW**.classroom\_id;

**END**;

**CREATE** **TRIGGER** set\_is\_deleted\_timetable **AFTER** **DELETE**

**ON** timetable

**FOR** **EACH** **ROW**

**BEGIN**

**INSERT** **INTO** timetable (timetable\_id, date\_of\_study, class\_id, subject\_id, teacher\_id, classroom\_id, date\_created\_timetable, user\_created\_timetable, date\_updated\_timetable, user\_updated\_timetable, is\_deleted\_timetable)

**VALUES** (**OLD**.timetable\_id, **OLD**.date\_of\_study, **OLD**.class\_id, **OLD**.subject\_id, **OLD**.teacher\_id, **OLD**.classroom\_id, **OLD**.date\_created\_timetable, **OLD**.user\_created\_timetable, **OLD**.date\_updated\_timetable, **OLD**.user\_updated\_timetable, **True**);

**END**;

**CREATE** **TRIGGER** set\_user\_created\_timetable **AFTER** **INSERT**

**ON** timetable

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_created\_timetable **IS** **NULL**)

**BEGIN**

**UPDATE** timetable **SET** user\_created\_timetable = 'teacher' **WHERE** timetable\_id = **NEW**.timetable\_id;

**END**;

**CREATE** **TRIGGER** set\_user\_updated\_timetable **AFTER** **UPDATE** **OF** date\_of\_study, class\_id, subject\_id, teacher\_id, classroom\_id

**ON** timetable

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_updated\_timetable **IS** **NULL**)

**BEGIN**

**UPDATE** timetable **SET** user\_updated\_timetable = 'expert' **WHERE** date\_of\_study = **NEW**.date\_of\_study **OR** class\_id = **NEW**.class\_id **OR** subject\_id = **NEW**.subject\_id **OR** teacher\_id = **NEW**.teacher\_id **OR** classroom\_id = **NEW**.classroom\_id;

**END**;

**CREATE** **TRIGGER** set\_date\_created\_student **AFTER** **INSERT**

**ON** student

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_created\_student **IS** **NULL**)

**BEGIN**

**UPDATE** student **SET** date\_created\_student = **DATETIME**('now') **WHERE** student\_id = **NEW**.student\_id;

**END**;

**CREATE** **TRIGGER** set\_date\_updated\_student **AFTER** **UPDATE** **OF** full\_name, class\_id, date\_of\_birth, address, tel\_number

**ON** student

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_updated\_student **IS** **NULL**)

**BEGIN**

**UPDATE** student **SET** date\_updated\_student = **DATETIME**('now') **WHERE** full\_name = **NEW**.full\_name **OR** class\_id = **NEW**.class\_id **OR** date\_of\_birth = **NEW**.date\_of\_birth **OR** address = **NEW**.address **OR** tel\_number = **NEW**.tel\_number;

**END**;

**CREATE** **TRIGGER** set\_is\_deleted\_student **AFTER** **DELETE**

**ON** student

**FOR** **EACH** **ROW**

**BEGIN**

**INSERT** **INTO** student (student\_id, full\_name, class\_id, date\_of\_birth, address, tel\_number, date\_created\_student, user\_created\_student, date\_updated\_student, user\_updated\_student, is\_deleted\_student)

**VALUES** (**OLD**.student\_id, **OLD**.full\_name, **OLD**.class\_id, **OLD**.date\_of\_birth, **OLD**.address, **OLD**.tel\_number, **OLD**.date\_created\_student, **OLD**.user\_created\_student, **OLD**.date\_updated\_student, **OLD**.user\_updated\_student, **True**);

**END**;

**CREATE** **TRIGGER** set\_user\_created\_student **AFTER** **INSERT**

**ON** student

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.date\_created\_student **IS** **NULL**)

**BEGIN**

**UPDATE** student **SET** user\_created\_student = 'teacher' **WHERE** student\_id = **NEW**.student\_id;

**END**;

**CREATE** **TRIGGER** set\_user\_updated\_student **AFTER** **UPDATE** **OF** full\_name, class\_id, date\_of\_birth, address, tel\_number

**ON** student

**FOR** **EACH** **ROW**

**WHEN** (**NEW**.user\_updated\_student **IS** **NULL**)

**BEGIN**

**UPDATE** student **SET** user\_updated\_student= 'expert' **WHERE** full\_name = **NEW**.full\_name **OR** class\_id = **NEW**.class\_id **OR** date\_of\_birth = **NEW**.date\_of\_birth **OR** address = **NEW**.address **OR** tel\_number = **NEW**.tel\_number;

**END**;

**Связи между таблицами:**

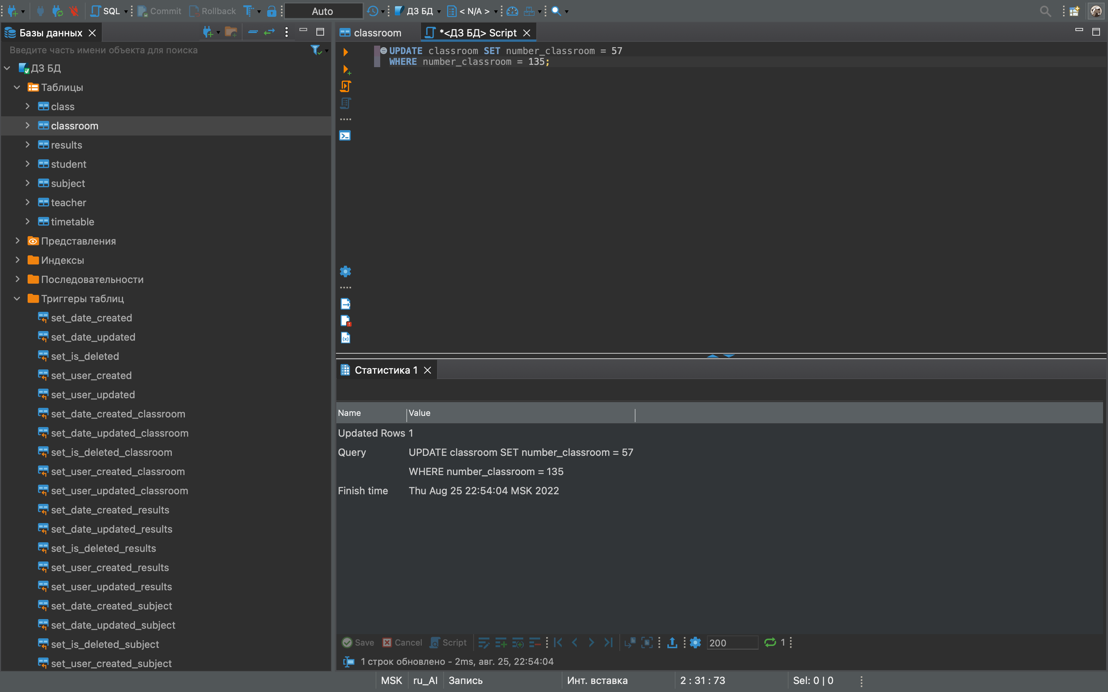
* Classroom-Timetable (1 к 1);
* Class-Timetable (1 к 1);
* Class-Student (1 ко многим);
* Student-Results (многие ко многим);
* Results-Subject (многие ко многим);
* Teacher-Timetable (многие ко многим).

**Запросы:**

1.UPDATE

**UPDATE** classroom **SET** number\_classroom = 57

**WHERE** number\_classroom = 135;



Работа триггера на UPDATE

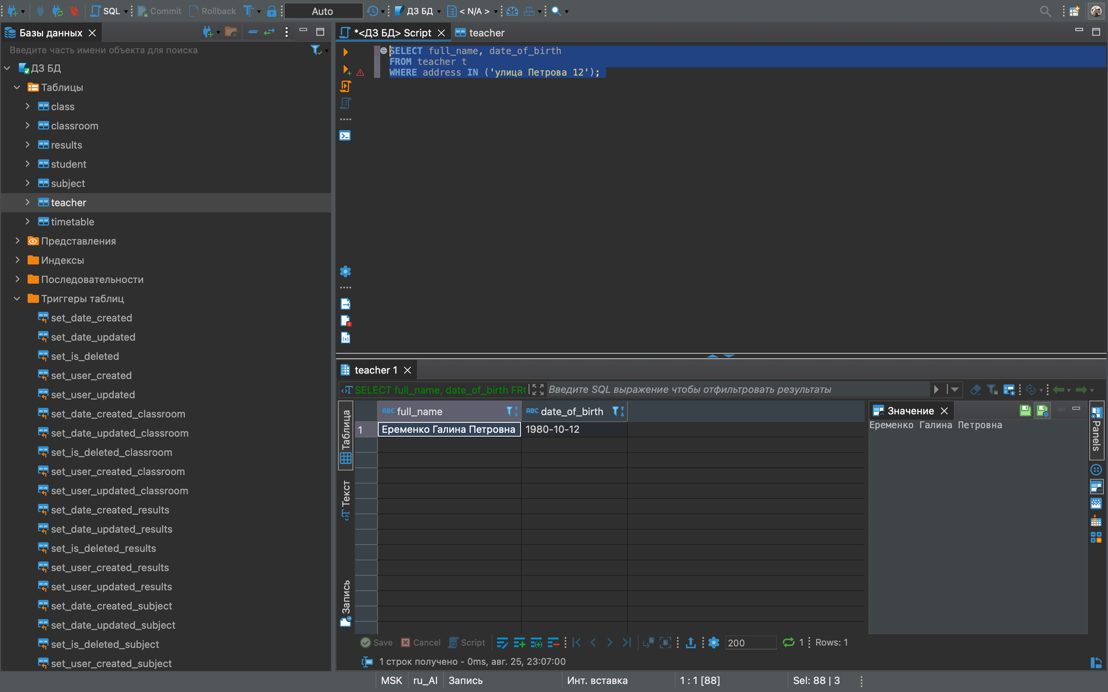


2. WHERE + IN

**SELECT** full\_name, date\_of\_birth

**FROM** teacher t

**WHERE** address **IN** ('улица Петрова 12');

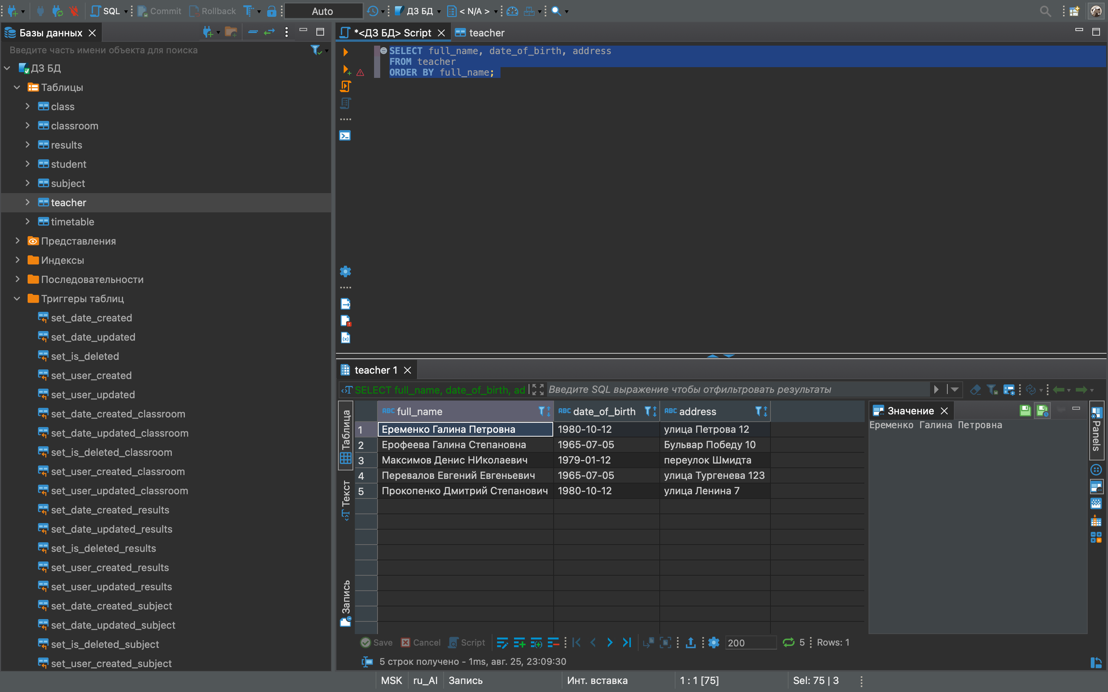


3. ORDER BY

**SELECT** full\_name, date\_of\_birth, address

**FROM** teacher

**ORDER** **BY** full\_name;

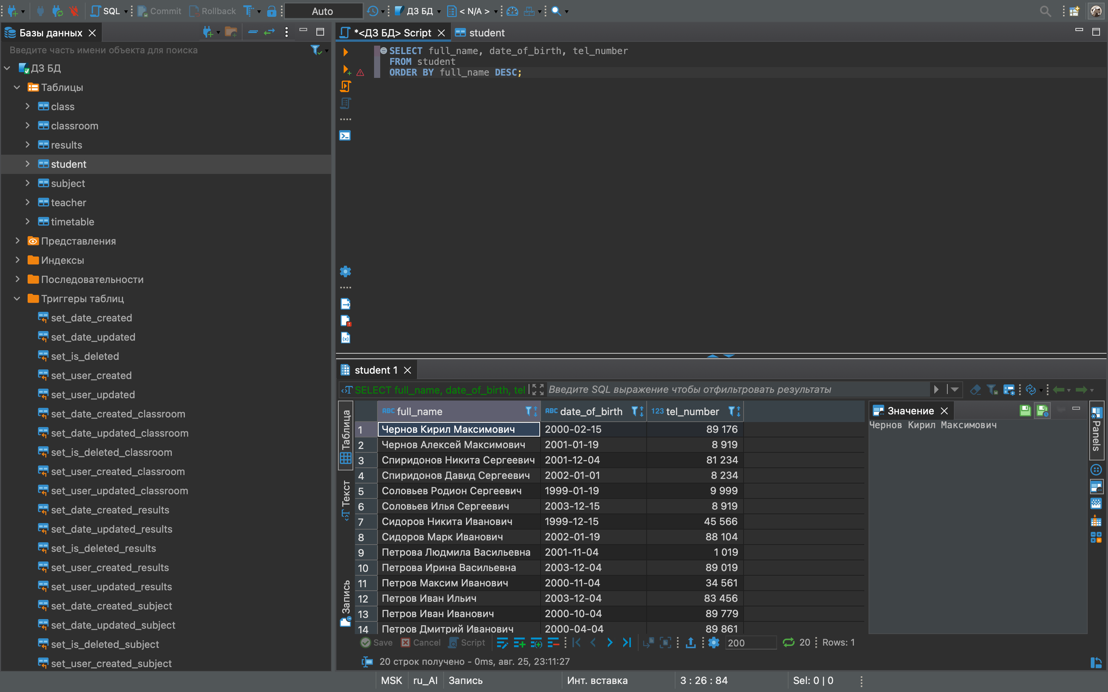


4. ORDER BY DESC

**SELECT** full\_name, date\_of\_birth, tel\_number

**FROM** student

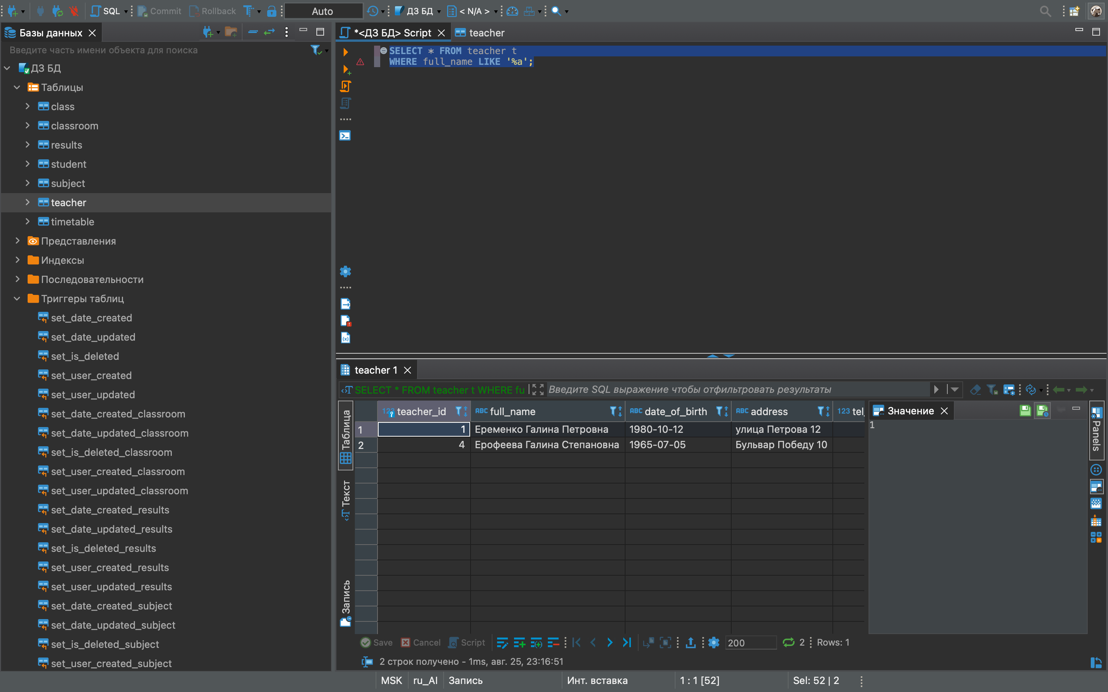
**ORDER** **BY** full\_name **DESC**;



5. LIKE

**SELECT** \* **FROM** teacher t

**WHERE** full\_name **LIKE** '%а';

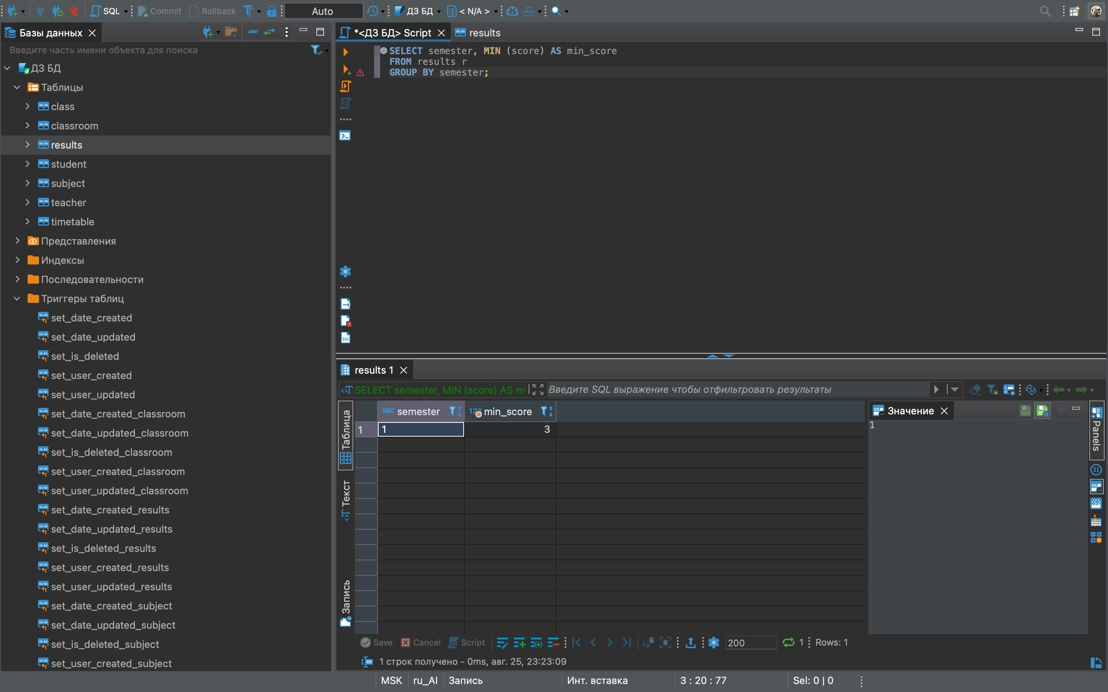


6. MIN

**SELECT** semester, **MIN** (score) **AS** min\_score

**FROM** results r

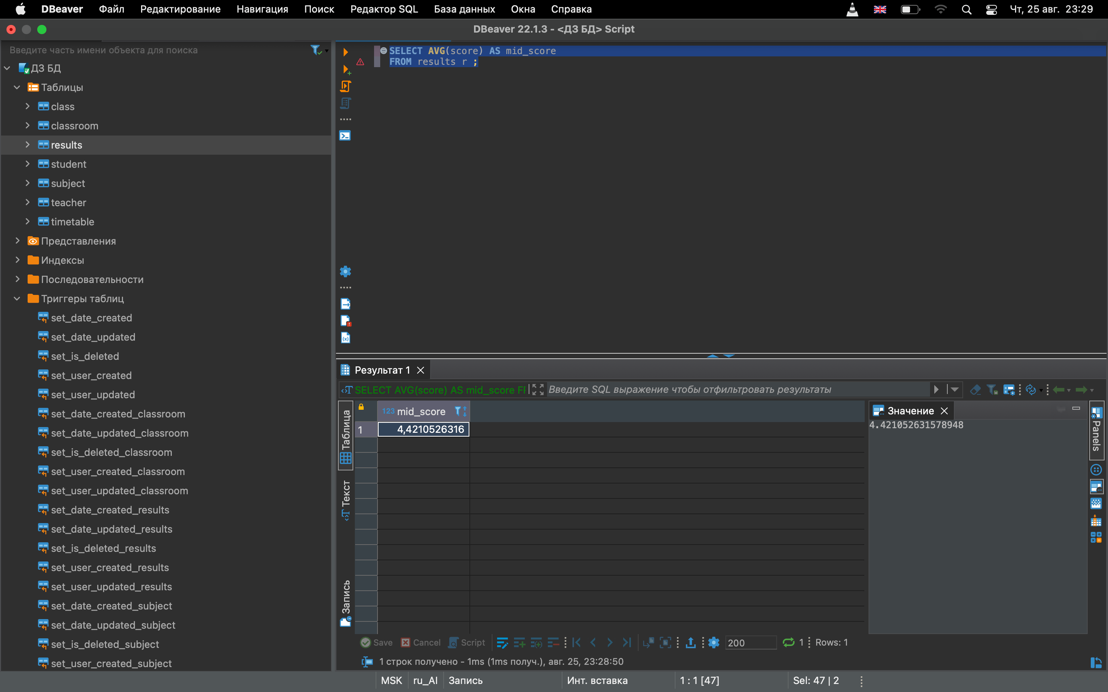
**GROUP** **BY** semester;



7. AVG

**SELECT** **AVG**(score) **AS** mid\_score

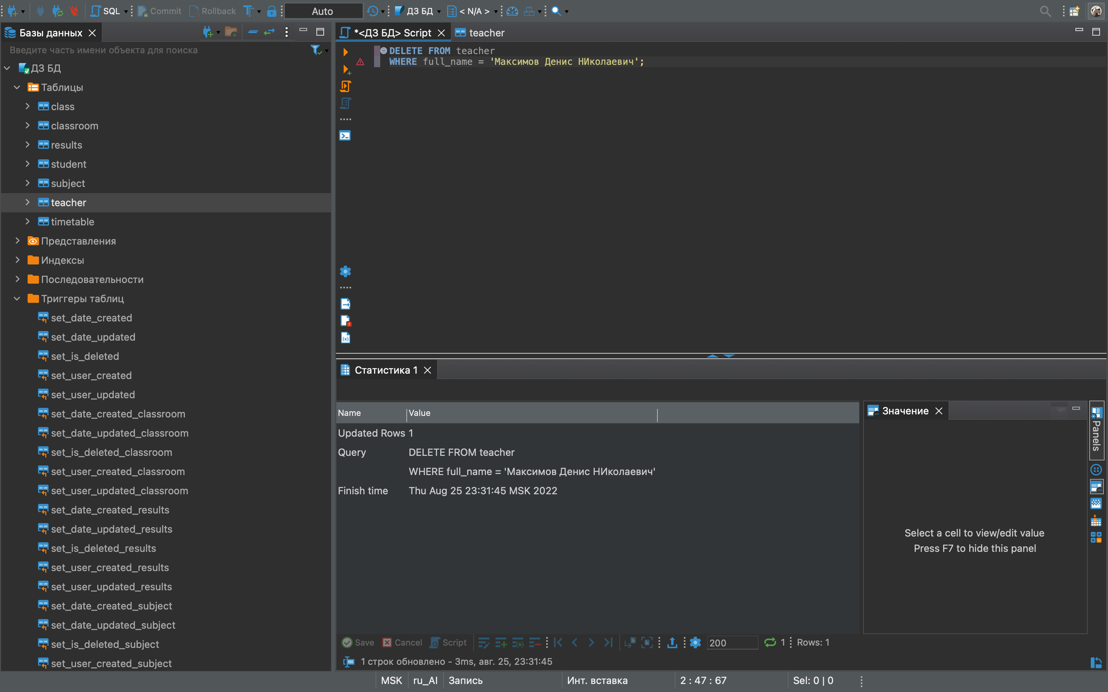
**FROM** results r ;



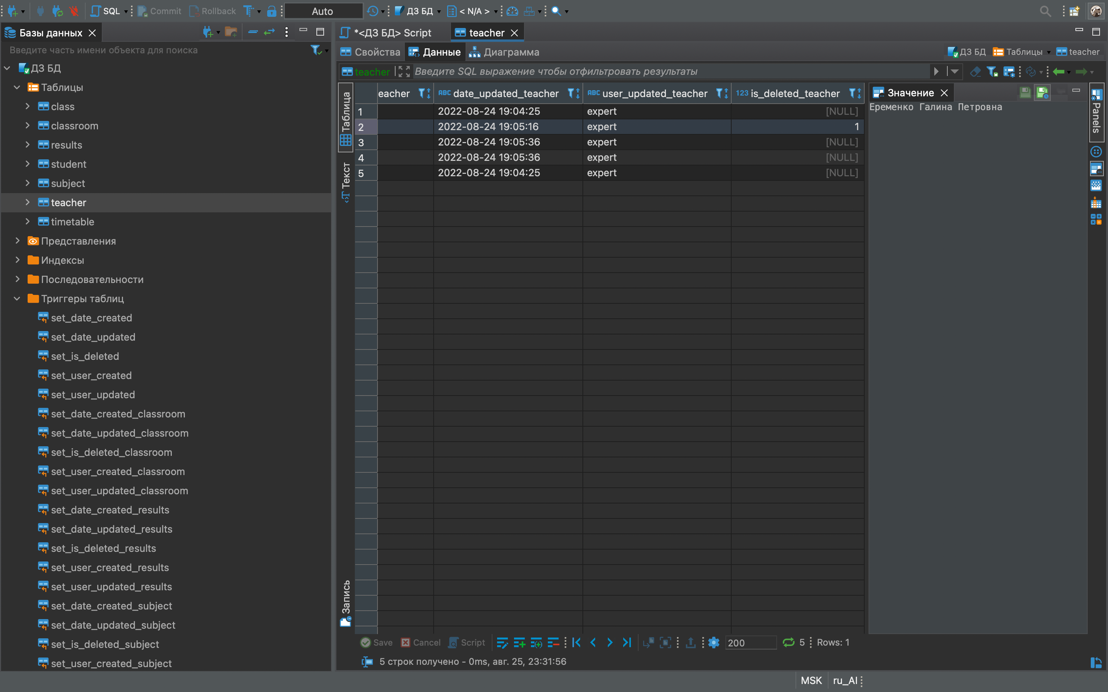
8. DELETE

**DELETE** **FROM** teacher

**WHERE** full\_name = 'Максимов Денис НИколаевич';



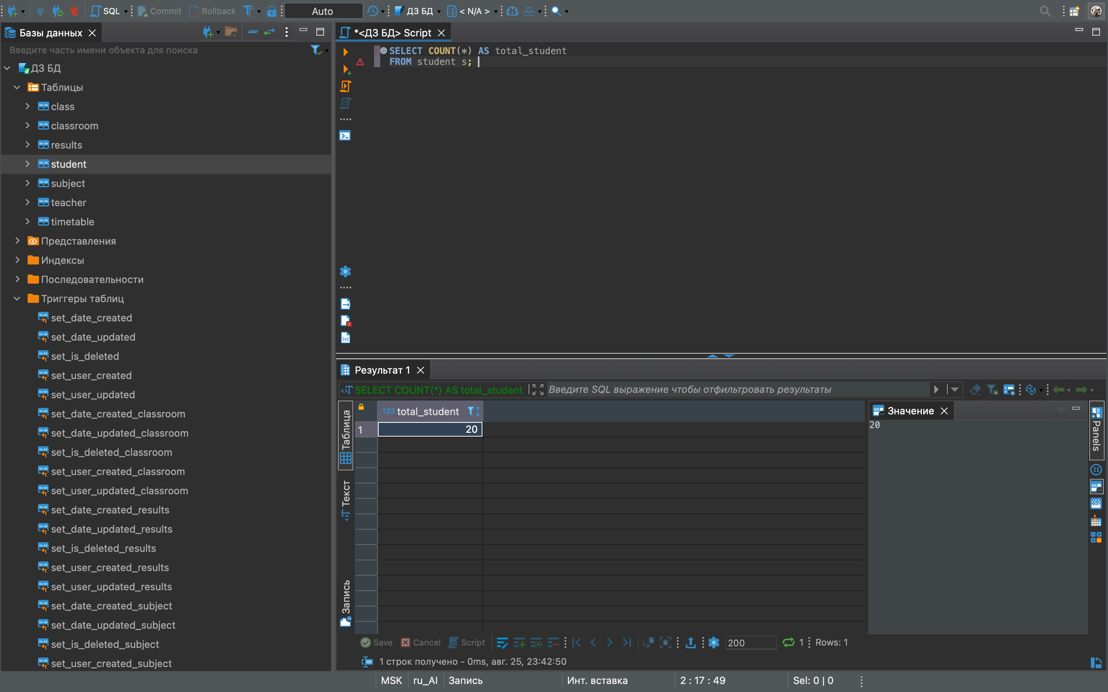
Работа триггера на DELETE



9. COUNT (\*)

**SELECT** **COUNT**(\*) **AS** total\_student

**FROM** student s;



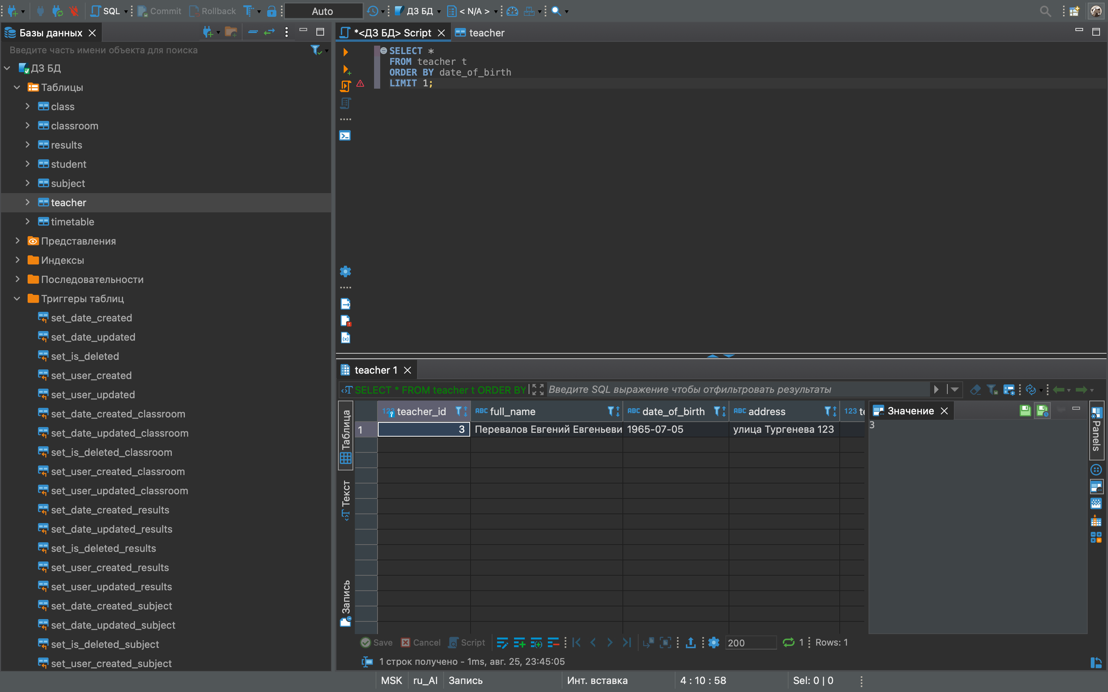
10. ORDER BY + LIMIT

**SELECT** \*

**FROM** teacher t

**ORDER** **BY** date\_of\_birth

**LIMIT** 1;

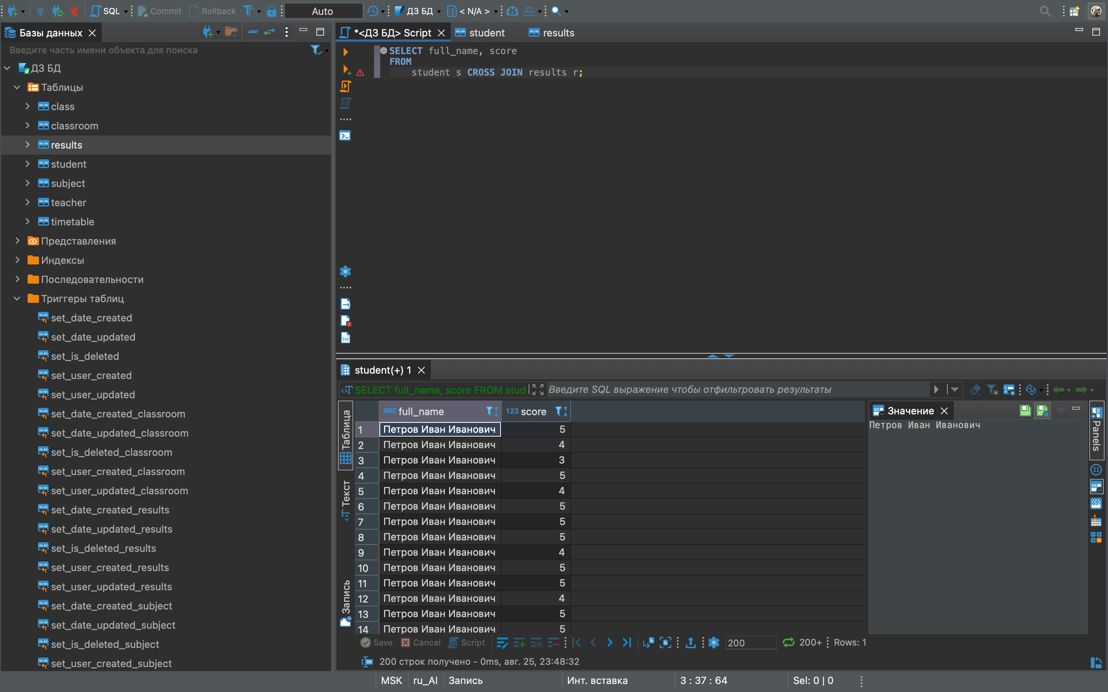


11. CROSS JOIN

**SELECT** full\_name, score

**FROM**

student s **CROSS** **JOIN** results r;



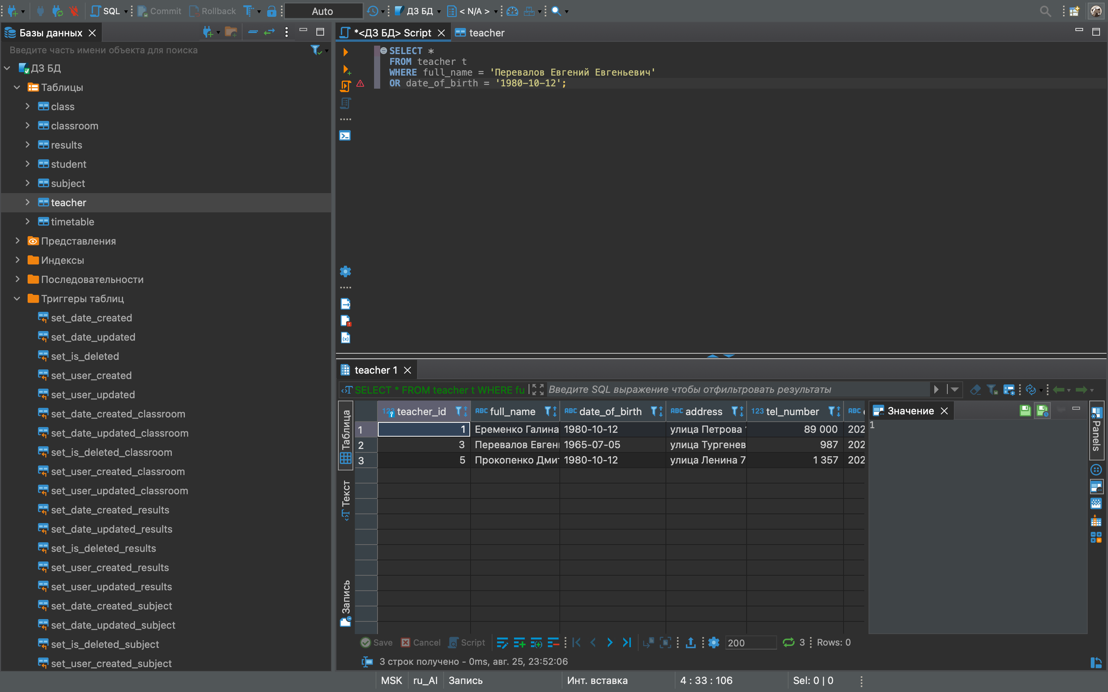
12. WHERE + OR

**SELECT** \*

**FROM** teacher t

**WHERE** full\_name = 'Перевалов Евгений Евгеньевич'

**OR** date\_of\_birth = '1980-10-12';

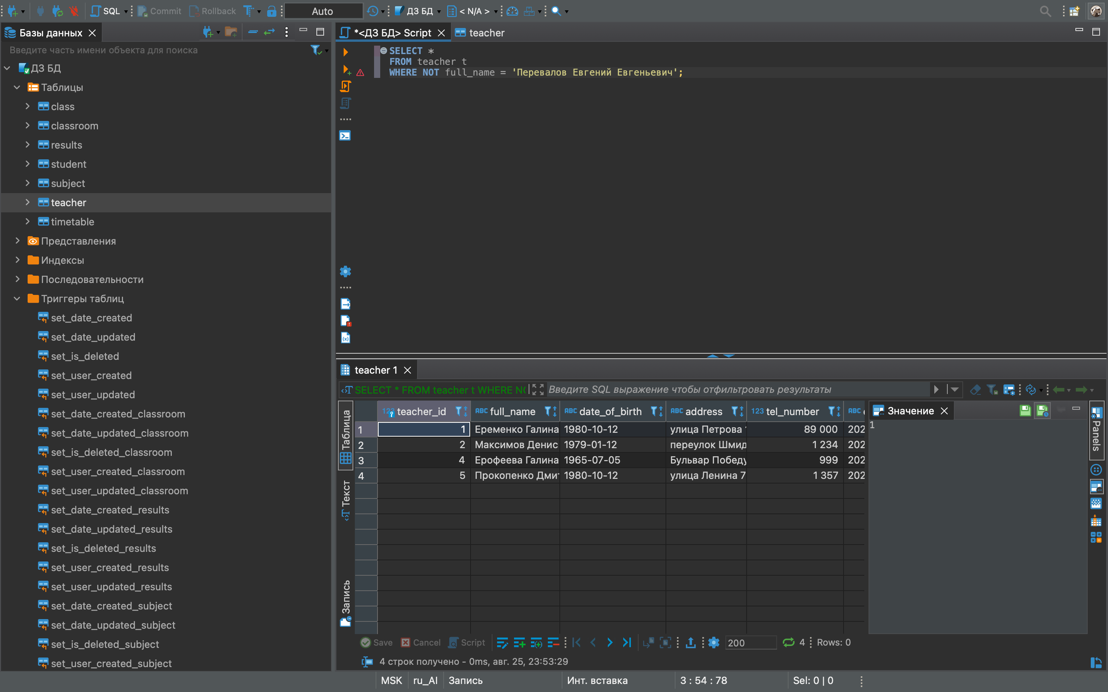


13. WHERE + NOT

**SELECT** \*

**FROM** teacher t

**WHERE** **NOT** full\_name = 'Перевалов Евгений Евгеньевич';



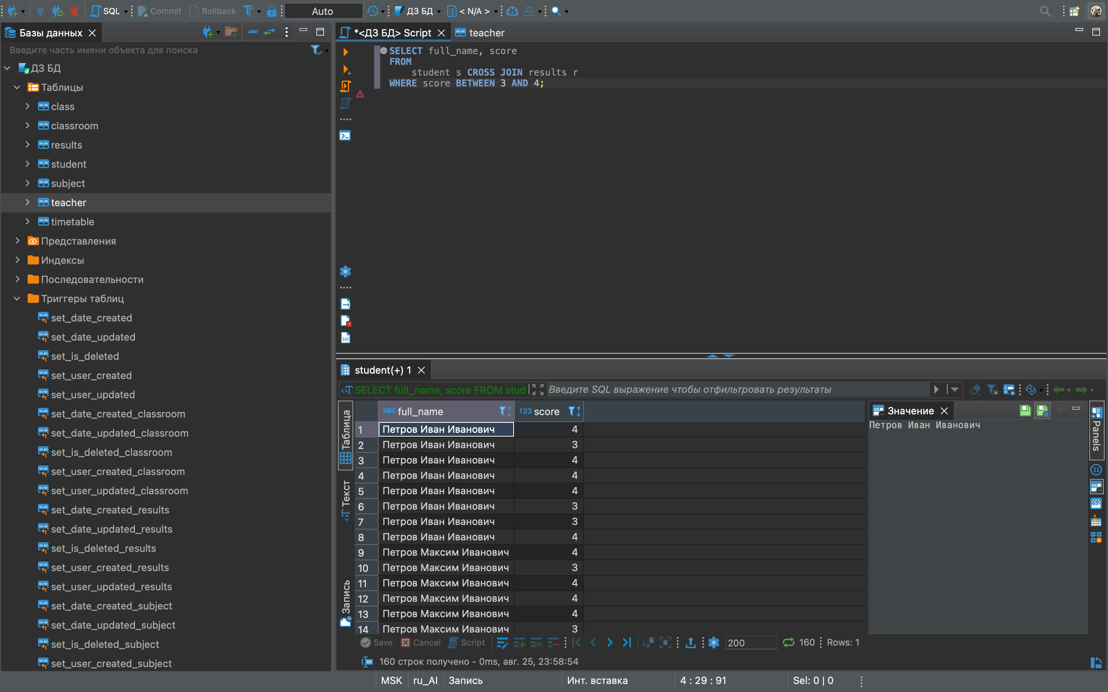
14. BETWEEN

**SELECT** full\_name, score

**FROM**

student s **CROSS** **JOIN** results r

**WHERE** score **BETWEEN** 3 **AND** 4;



15. MIN, MAX

**SELECT** full\_name, **MIN** (score) **AS** min\_score, **MAX** (score) **AS** max\_score

**FROM**

student s **CROSS** **JOIN** results r

**GROUP** **BY** full\_name;

