

«Министерство образования и науки Российской Федерации  
Федеральное государственное бюджетное образовательное  
учреждение высшего образования «Алтайский государственный  
технический университет им. И.И. Ползунова»

Факультет информационных технологий  
Кафедра прикладной математики

Отчёт защищён с оценкой \_\_\_\_\_  
Преподаватель Ананьев П.И.

« \_\_\_\_\_ » \_\_\_\_\_ 2022 г.

Отчёт  
По лабораторной работе №4  
«Создание модели данных с помощью CASE-средства,  
поддерживающего ER-моделирование»

Студент группы ПИ-92 Шульпов В.М.

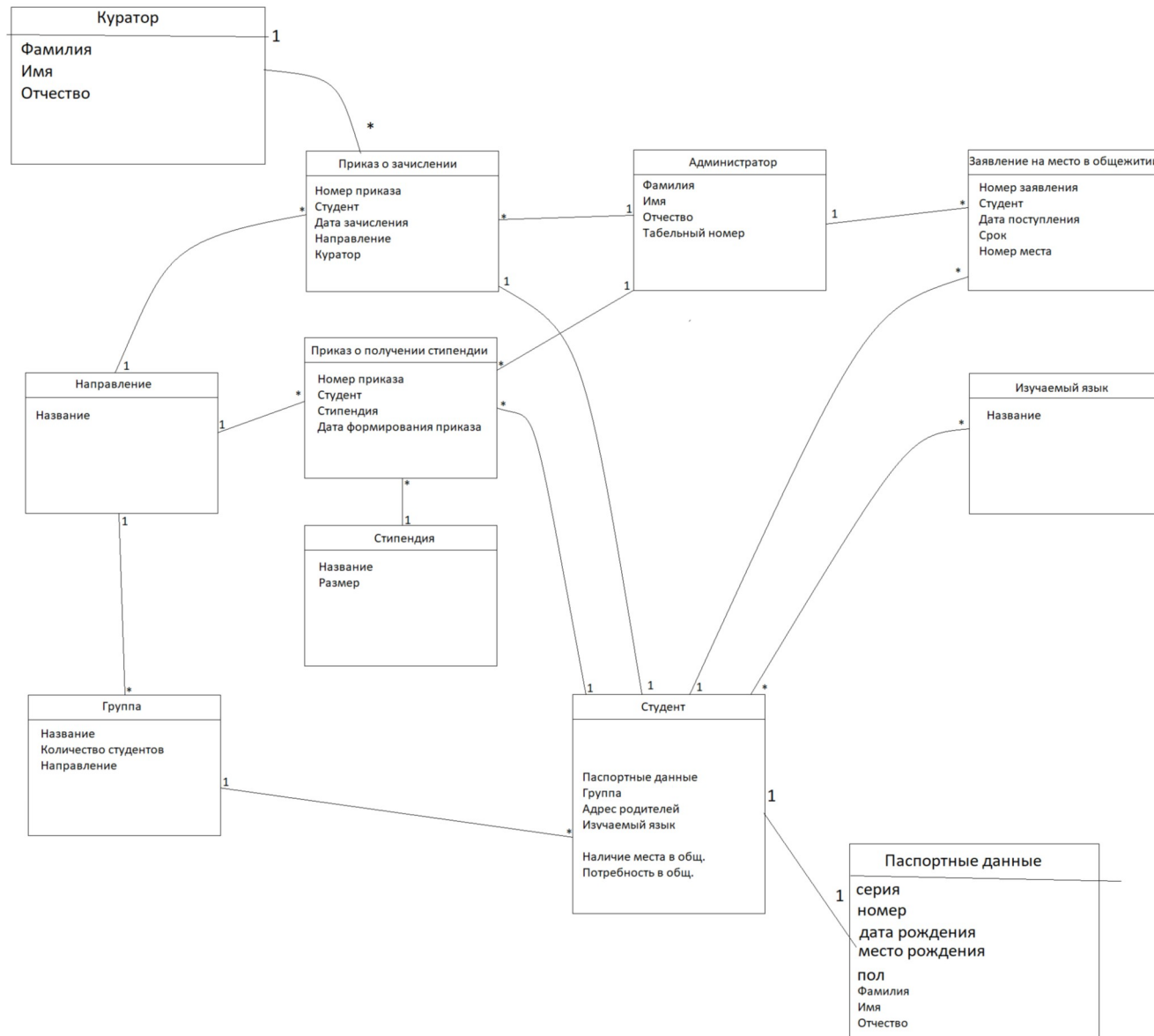
Преподаватель доцент Ананьев П.И.

Барнаул 2022

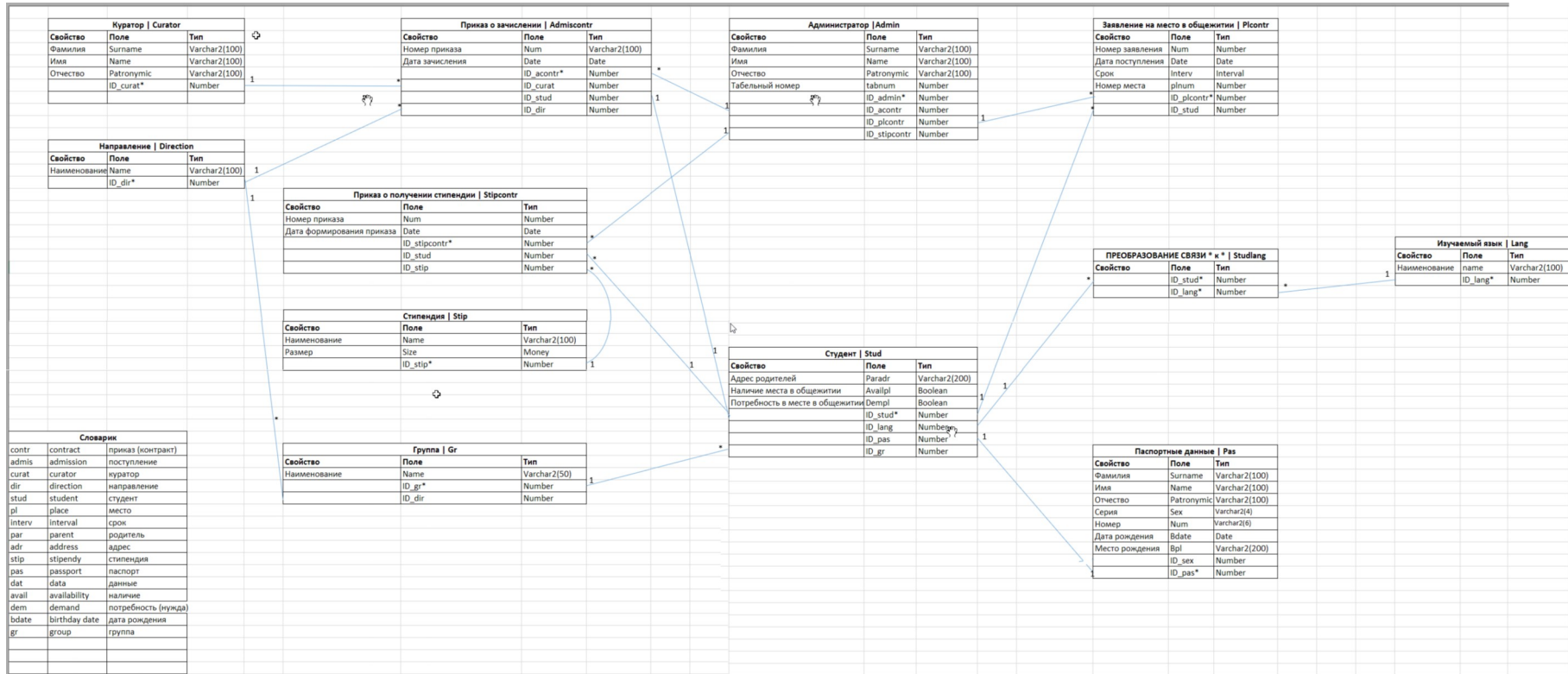
### **Вариант 34**

Кадры студентов. Паспортные данные, группа, адрес родителей, изучаемый язык, размер стипендии, наличие места в общежитии (или потребность в нем).

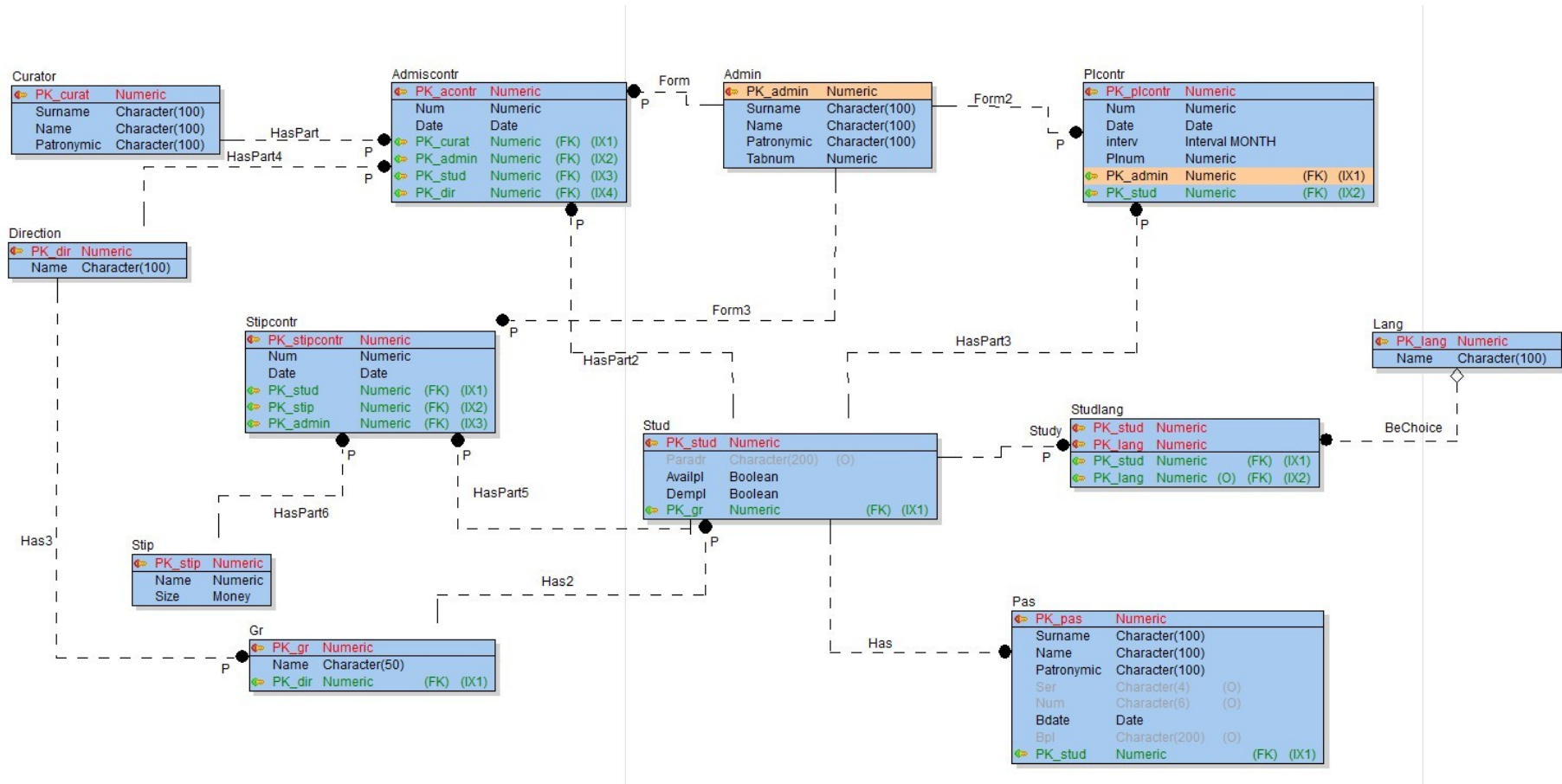
## Концептуальная модель



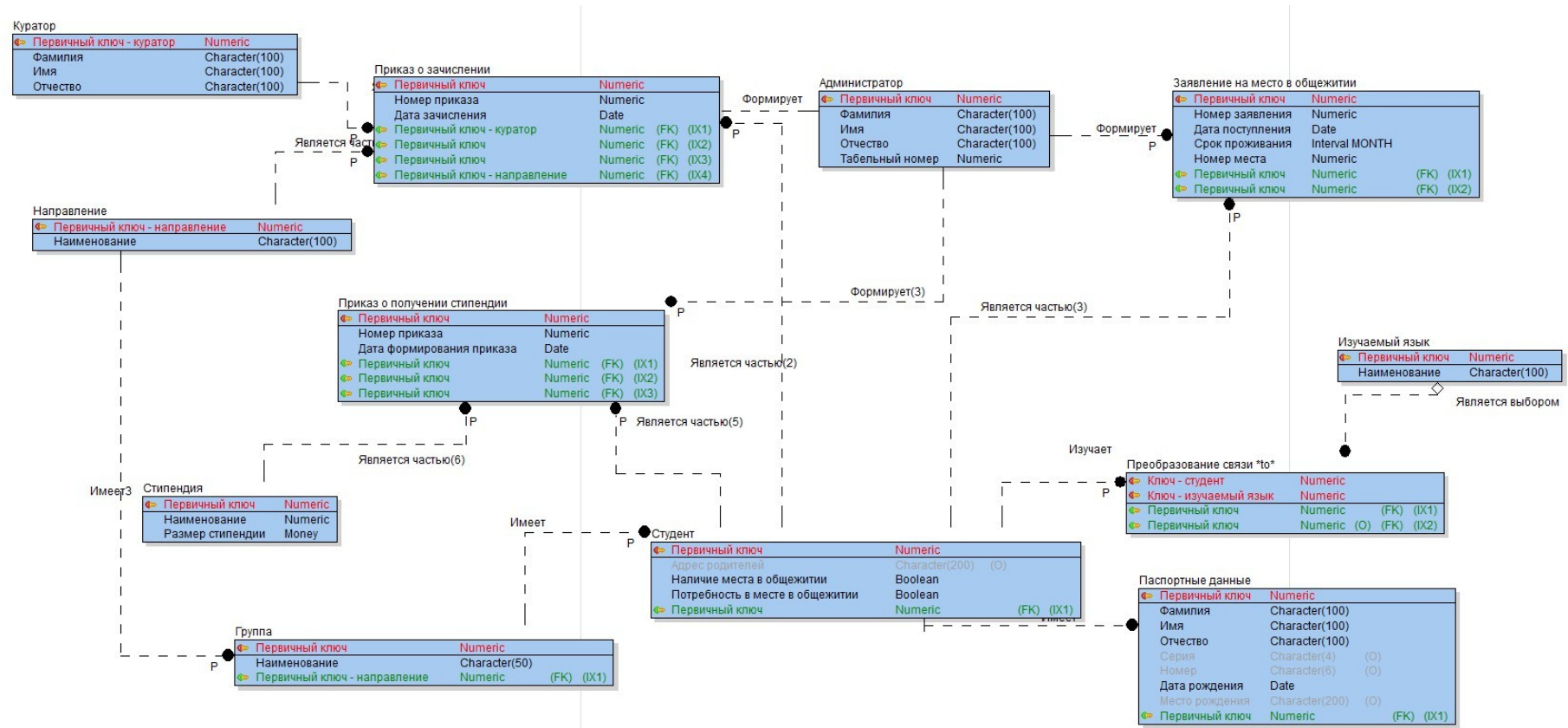
# Реляционная модель



## Логическая модель в технологии IDEF1X



## Логическая модель в технологии IDEF1X (captions)



**Ссылочная целостность не нарушается** благодаря методу обработки restrict

The screenshot shows a 'Relationship' dialog box with a diagram at the top showing a one-to-one relationship between 'Entity1' and 'Entity2'. Below the diagram are tabs for 'Comments', 'Notes', 'Generate', 'DDL', 'Type', 'Referential Integrity', 'Advanced', and 'Keys'. The 'Referential Integrity' tab is selected, showing settings for 'Parent' and 'Child' operations. All four operations (Update, Delete, Insert, Update) are set to 'Restrict'. At the bottom, there is a 'Constraint Name' field with the text '%relname%'.

Parent	Child
Update: Restrict	Insert: Restrict
Delete: Restrict	Update: Restrict

Constraint Name: %relname%

*Restrict – проверяет, имеются ли в подчиненной таблице записи, удовлетворяющие значению текущего первичного ключа, и при их наличии запрещает изменение первичного ключа ( запрещает добавление записи к подчиненной таблице, если в главной таблице отсутствует запись с подходящим значением ключа)*

## Сгенерированный DDL скрипт

/\*

Created: 09.04.2022

Modified: 10.04.2022

Model: PostgreSQL 12

Database: PostgreSQL 12

\*/

-- Create tables section -----

-- Table Curator

CREATE TABLE "Curator"

(

  "Surname" Character(100) NOT NULL,

  "Name" Character(100) NOT NULL,

  "Patronymic" Character(100) NOT NULL,

  "PK\_curat" Numeric NOT NULL

)

WITH (

  autovacuum\_enabled=true)

;

ALTER TABLE "Curator" ADD CONSTRAINT "PK\_Curator" PRIMARY KEY ("PK\_curat")

;

-- Table Direction

CREATE TABLE "Direction"

(



```

    "Name" Character(100) NOT NULL,
    "PK_dir" Numeric NOT NULL
)
WITH (
    autovacuum_enabled=true)
;

ALTER TABLE "Direction" ADD CONSTRAINT "PK_Direction" PRIMARY KEY ("PK_dir")
;

-- Table Admiscontr

CREATE TABLE "Admiscontr"
(
    "Num" Numeric NOT NULL,
    "Date" Date NOT NULL,
    "PK_acontr" Numeric NOT NULL,
    "PK_curat" Numeric NOT NULL,
    "PK_admin" Numeric NOT NULL,
    "PK_stud" Numeric NOT NULL,
    "PK_dir" Numeric NOT NULL
)
WITH (
    autovacuum_enabled=true)
;

CREATE INDEX "IX_Relationship2" ON "Admiscontr" ("PK_curat")
;

CREATE INDEX "IX_Relationship3" ON "Admiscontr" ("PK_admin")

```

;

CREATE INDEX "IX\_Relationship5" ON "Admiscontr" ("PK\_stud")

;

CREATE INDEX "IX\_Relationship13" ON "Admiscontr" ("PK\_dir")

;

ALTER TABLE "Admiscontr" ADD CONSTRAINT "PK\_Admiscontr" PRIMARY KEY ("PK\_acontr")

;

-- Table Admin

CREATE TABLE "Admin"

(

"Surname" Character(100) NOT NULL,

"Name" Character(100) NOT NULL,

"Patronymic" Character(100) NOT NULL,

"Tabnum" Numeric NOT NULL,

"PK\_admin" Numeric NOT NULL

)

WITH (

autovacuum\_enabled=true)

;

ALTER TABLE "Admin" ADD CONSTRAINT "PK\_Admin" PRIMARY KEY ("PK\_admin")

;

-- Table Plcontr

```
CREATE TABLE "Plcontr"
(
  "Num" Numeric NOT NULL,
  "Date" Date NOT NULL,
  "interv" Interval MONTH NOT NULL,
  "Plnum" Numeric NOT NULL,
  "PK_plcontr" Numeric NOT NULL,
  "PK_admin" Numeric NOT NULL,
  "PK_stud" Numeric NOT NULL
)
WITH (
  autovacuum_enabled=true)
;

CREATE INDEX "IX_Relationship4" ON "Plcontr" ("PK_admin")
;

CREATE INDEX "IX_Relationship6" ON "Plcontr" ("PK_stud")
;

ALTER TABLE "Plcontr" ADD CONSTRAINT "PK_Plcontr" PRIMARY KEY ("PK_plcontr")
;

-- Table Studlang

CREATE TABLE "Studlang"
(
  "PK_stud" Numeric NOT NULL,
  "PK_lang" Numeric NOT NULL,
  "PK_stud" Numeric NOT NULL,
```

```
"PK_lang" Numeric
)
WITH (
    autovacuum_enabled=true)
;

CREATE INDEX "IX_Relationship9" ON "Studlang" ("PK_stud")
;

CREATE INDEX "IX_Relationship10" ON "Studlang" ("PK_lang")
;

ALTER TABLE "Studlang" ADD CONSTRAINT "PK_Studlang" PRIMARY KEY ("PK_stud","PK_lang")
;

-- Table Lang

CREATE TABLE "Lang"
(
    "Name" Character(100) NOT NULL,
    "PK_lang" Numeric NOT NULL
)
WITH (
    autovacuum_enabled=true)
;

ALTER TABLE "Lang" ADD CONSTRAINT "PK_Lang" PRIMARY KEY ("PK_lang")
;

-- Table Pas
```

```
CREATE TABLE "Pas"
(
  "Surname" Character(100) NOT NULL,
  "Name" Character(100) NOT NULL,
  "Patronymic" Character(100) NOT NULL,
  "Ser" Character(4),
  "Num" Character(6),
  "Bdate" Date NOT NULL,
  "Bpl" Character(200),
  "PK_pas" Numeric NOT NULL,
  "PK_stud" Numeric NOT NULL
)
WITH (
  autovacuum_enabled=true)
;

CREATE INDEX "IX_Relationship11" ON "Pas" ("PK_stud")
;

ALTER TABLE "Pas" ADD CONSTRAINT "PK_Pas" PRIMARY KEY ("PK_pas")
;

-- Table Stud

CREATE TABLE "Stud"
(
  "Paradr" Character(200),
  "Availpl" Boolean DEFAULT False NOT NULL,
  "Dempl" Boolean DEFAULT False NOT NULL,
```

```
"PK_stud" Numeric NOT NULL,
"PK_gr" Numeric NOT NULL
)
WITH (
    autovacuum_enabled=true)
;

CREATE INDEX "IX_Relationship12" ON "Stud" ("PK_gr")
;

ALTER TABLE "Stud" ADD CONSTRAINT "PK_Stud" PRIMARY KEY ("PK_stud")
;

-- Table Stipcontr

CREATE TABLE "Stipcontr"
(
    "Num" Numeric NOT NULL,
    "Date" Date NOT NULL,
    "PK_stipcontr" Numeric NOT NULL,
    "PK_stud" Numeric NOT NULL,
    "PK_stip" Numeric NOT NULL,
    "PK_admin" Numeric NOT NULL
)
WITH (
    autovacuum_enabled=true)
;

CREATE INDEX "IX_Relationship15" ON "Stipcontr" ("PK_stud")
;
```

```
CREATE INDEX "IX_Relationship16" ON "Stipcontr" ("PK_stip")
```

```
;
```

```
CREATE INDEX "IX_Relationship17" ON "Stipcontr" ("PK_admin")
```

```
;
```

```
ALTER TABLE "Stipcontr" ADD CONSTRAINT "PK_Stipcontr" PRIMARY KEY ("PK_stipcontr")
```

```
;
```

```
-- Table Stip
```

```
CREATE TABLE "Stip"
```

```
(
```

```
  "Name" Numeric NOT NULL,
```

```
  "Size" Money NOT NULL,
```

```
  "PK_stip" Numeric NOT NULL
```

```
)
```

```
WITH (
```

```
  autovacuum_enabled=true)
```

```
;
```

```
ALTER TABLE "Stip" ADD CONSTRAINT "PK_Stip" PRIMARY KEY ("PK_stip")
```

```
;
```

```
-- Table Gr
```

```
CREATE TABLE "Gr"
```

```
(
```

```
  "Name" Character(50) NOT NULL,
```

```
"PK_gr" Numeric NOT NULL,  
"PK_dir" Numeric NOT NULL  
)
```

```
WITH (  
    autovacuum_enabled=true)
```

```
;
```

```
CREATE INDEX "IX_Relationship14" ON "Gr" ("PK_dir")
```

```
;
```

```
ALTER TABLE "Gr" ADD CONSTRAINT "PK_Gr" PRIMARY KEY ("PK_gr")
```

```
;
```

```
-- Create foreign keys (relationships) section -----
```

```
ALTER TABLE "Admiscontr"  
    ADD CONSTRAINT "HasPart"  
        FOREIGN KEY ("PK_curat")  
        REFERENCES "Curator" ("PK_curat")  
        ON DELETE RESTRICT  
        ON UPDATE RESTRICT
```

```
;
```

```
ALTER TABLE "Admiscontr"  
    ADD CONSTRAINT "Form"  
        FOREIGN KEY ("PK_admin")  
        REFERENCES "Admin" ("PK_admin")  
        ON DELETE RESTRICT  
        ON UPDATE RESTRICT
```

```
;
```



```
ALTER TABLE "Plcontr"  
  ADD CONSTRAINT "Form2"  
    FOREIGN KEY ("PK_admin")  
    REFERENCES "Admin" ("PK_admin")  
    ON DELETE RESTRICT  
    ON UPDATE RESTRICT  
;
```

```
ALTER TABLE "Admiscontr"  
  ADD CONSTRAINT "HasPart2"  
    FOREIGN KEY ("PK_stud")  
    REFERENCES "Stud" ("PK_stud")  
    ON DELETE RESTRICT  
    ON UPDATE RESTRICT  
;
```

```
ALTER TABLE "Plcontr"  
  ADD CONSTRAINT "HasPart3"  
    FOREIGN KEY ("PK_stud")  
    REFERENCES "Stud" ("PK_stud")  
    ON DELETE RESTRICT  
    ON UPDATE RESTRICT  
;
```

```
ALTER TABLE "Studlang"  
  ADD CONSTRAINT "Study"  
    FOREIGN KEY ("PK_stud")  
    REFERENCES "Stud" ("PK_stud")  
    ON DELETE RESTRICT
```

```
        ON UPDATE RESTRICT
;

ALTER TABLE "Studlang"
ADD CONSTRAINT "BeChoice"
FOREIGN KEY ("PK_lang")
REFERENCES "Lang" ("PK_lang")
ON DELETE NO ACTION
ON UPDATE NO ACTION
;

ALTER TABLE "Pas"
ADD CONSTRAINT "Has"
FOREIGN KEY ("PK_stud")
REFERENCES "Stud" ("PK_stud")
ON DELETE RESTRICT
ON UPDATE RESTRICT
;

ALTER TABLE "Stud"
ADD CONSTRAINT "Has2"
FOREIGN KEY ("PK_gr")
REFERENCES "Gr" ("PK_gr")
ON DELETE RESTRICT
ON UPDATE RESTRICT
;

ALTER TABLE "Admiscontr"
ADD CONSTRAINT "HasPart4"
FOREIGN KEY ("PK_dir")
```

```
REFERENCES "Direction" ("PK_dir")  
ON DELETE RESTRICT  
ON UPDATE RESTRICT  
;
```

```
ALTER TABLE "Gr"  
ADD CONSTRAINT "Has3"  
FOREIGN KEY ("PK_dir")  
REFERENCES "Direction" ("PK_dir")  
ON DELETE RESTRICT  
ON UPDATE RESTRICT  
;
```

```
ALTER TABLE "Stipcontr"  
ADD CONSTRAINT "HasPart5"  
FOREIGN KEY ("PK_stud")  
REFERENCES "Stud" ("PK_stud")  
ON DELETE RESTRICT  
ON UPDATE RESTRICT  
;
```

```
ALTER TABLE "Stipcontr"  
ADD CONSTRAINT "HasPart6"  
FOREIGN KEY ("PK_stip")  
REFERENCES "Stip" ("PK_stip")  
ON DELETE RESTRICT  
ON UPDATE RESTRICT  
;
```

```
ALTER TABLE "Stipcontr"
```

```
ADD CONSTRAINT "Form3"  
  FOREIGN KEY ("PK_admin")  
  REFERENCES "Admin" ("PK_admin")  
  ON DELETE RESTRICT  
  ON UPDATE RESTRICT  
;
```