Homework 4

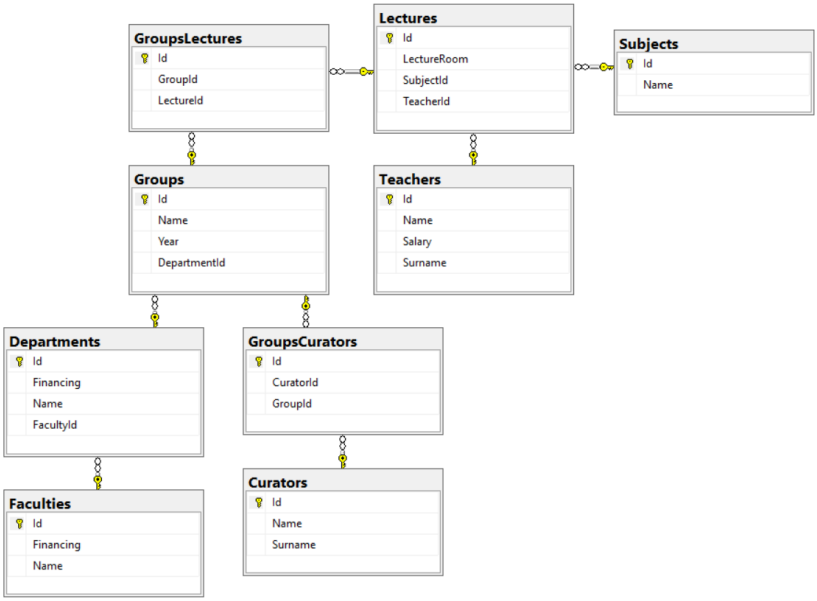
Course: Database Theory

Topic: Multiple table databases

Queries

1. Print all possible pairs of lines of teachers and groups.
2. Print names of faculties, where financing fund of departments exceeds financing fund of the faculty.
3. Print names of the group curators and groups names they are supervising.
4. Print names of the teachers who deliver lectures in the group "P107".
5. Print names of the teachers and names of the faculties where they are lecturing.
6. Print names of the departments and names of the groups that relate to them.
7. Print names of the subjects that the teacher "Samantha Adams" teaches.
8. Print names of the departments, where "Database Theory" is taught.
9. Print names of the groups that belong to the "Computer Science" faculty.
10. Print names of the 5th year groups, as well as names of the faculties to which they relate.
11. Print full names of the teachers and lectures they deliver (names of subjects and groups), and select only those lectures that are delivered in the classroom "B103".

Database Diagram



We added a script to this task to create a database structure for the current topic. We strongly recommend yout to create the database yourself, without this script. But if you have an extreme need, you can use it.

The SQL file with the database is attached to this PDF file. To access the material, open it in Adobe Acrobat Reader.

Description

The *Academy* database contains information on the Academy's staff, inner workings, and lectures delivered.

Teachers, who lecture at the Academy, are presented in the *Teachers* table, which contains basic information, such as: name, surname, and salary.

Also, the database contains information about groups stored in the *Groups* table. Data on faculties and departments are provided in the tables *Faculties* and *Departments*, respectively.

In addition, the database stores information related to the lectures delivered. Lecture schedule is in the Lectures table, and description of the subjects, on which lectures are delivered, is in the *Subjects* table.

Tables

Below is the detailed description of the structure of each table.

1. **Curators**
   - **Identifier (Id). Unique identifier of the curator.**
     - Data type is int.
     - Auto increment.
     - Cannot contain null values.
     - Primary key.
   - **Name. Curator's name.**
     - The data type is nvarchar(max).
     - Cannot contain null values.
     - Cannot be empty.
   - **Surname. Curator's name.**
     - Data type is nvarchar(max).
     - Cannot contain null values.
     - Cannot be empty.

2. **Departments**
   - **Identifier (Id). Unique identifier of the department.**

- Data type is int.
- Auto increment.
- Cannot contain null values.
- Primary key.

- **Financing. Financing fund of the department.**
  - Data type is money.
  - Cannot contain null values.
  - Cannot be less than 0.
  - Default value is 0.

- **Name. Department name.**
  - Data type is nvarchar(100).
  - Cannot contain null values.
  - Cannot be empty.
  - Must be unique.

- **Faculty identifier (FacultyId). Faculty including department.**
  - Data type is int.
  - Cannot contain null values.
  - Foreign key.

3. **Faculties**

- **Identifier (Id). Unique identifier of the faculty.**
  - Data type is int.
  - Auto increment.
  - Cannot contain null values.
  - Primary key.

- **Financing. Financing fund of faculty.**
  - Data type is money.

- ▹ Cannot contain null values.
- ▹ Cannot be less than 0.
- ▹ Default value is 0.

- **Name. Faculty name.**
  - ▹ Data type is nvarchar(100).
  - ▹ Cannot contain null values.
  - ▹ Cannot be empty.
  - ▹ Must be unique.

4. Groups

- **Identifier (Id). Unique group identifier.**
  - ▹ Data type is int.
  - ▹ Auto increment.
  - ▹ Cannot contain null values.
  - ▹ Primary key.
- **Name. Group name.**
  - ▹ Data type is nvarchar(10).
  - ▹ Cannot contain null values.
  - ▹ Cannot be empty.
  - ▹ Must be unique.
- **Year. Year in which the group studies.**
  - ▹ Data type is int.
  - ▹ Cannot contain null values.
  - ▹ Must be in the range from 1 to 5.
- **Department identifier (DepartmentId). Department, which includes the group.**
  - ▹ Data type is int.

- Cannot contain null values.
- Foreign key.

5. **Groups and Curators (GroupsCurators)**
   - **Identifier (Id). Unique identifier of the group and curator.**
     - Data type is int.
     - Auto increment.
     - Cannot contain null values.
     - Primary key.
   - **Curator identifier (CuratorId). Curator.**
     - Data type is int.
     - Cannot contain null values.
     - External key.
   - **Group identifier (GroupId). Group**
     - Data type is int.
     - Cannot contain null values.
     - Foreign key.
6. **Groups and Lectures (GroupsLectures)**
   - **Identifier (Id). Unique identifier of the group and lecture.**
     - Data type is int.
     - Auto increment.
     - Cannot contain null values.
     - Primary key.
   - **Group identifier (GroupId). Group**
     - Data type is int.
     - Cannot contain null values.
     - Foreign key.

- **Lecture Identifier (LectureId). Lecture**
  - Data type is int.
  - Cannot contain null values.
  - Foreign key.

7. **Lectures**

- **Identifier (Id). Unique lecture identifier.**
  - Data type is int.
  - Auto increment.
  - Cannot contain null values.
  - Primary key.
- **Classroom (LectureRoom). Classroom where lectures are delivered.**
  - Data type is nvarchar(max).
  - Cannot contain null values.
  - Cannot be empty.
- **Subject identifier (SubjectId). Subject on which the lecture is delivered.**
  - Data type is int.
  - Cannot contain null values.
  - Foreign key.
- **Teacher identifier (TeacherId). Teacher who delivers lecture.**
  - Data type is int.
  - Cannot contain null values.
  - Foreign key.

8. **Subjects**

- **Identifier (Id). Unique identifier of the subject.**

- ▹ Data type is int.
- ▹ Auto increment.
- ▹ Cannot contain null values.
- ▹ Primary key.

- **Name. Subject name.**
  - ▹ Data type is nvarchar(100).
  - ▹ Cannot contain null values.
  - ▹ Cannot be empty.
  - ▹ Must be unique.

9. Teachers

- **Identifier (Id). Unique identifier of the teacher.**
  - ▹ Data type is int.
  - ▹ Auto increment.
  - ▹ Cannot contain null values.
  - ▹ Primary key.
- **Name. Teacher's name**
  - ▹ Data type is nvarchar(max).
  - ▹ Cannot contain null values.
  - ▹ Cannot be empty.
- **Wage rate (Salary). The teacher's wage rate.**
  - ▹ Data type is money.
  - ▹ Cannot contain null values.
  - ▹ Cannot be less than or equal to 0.
- **Surname. Teacher's surname.**
  - ▹ Data type is nvarchar(max).
  - ▹ Cannot contain null values.
  - ▹ Cannot be empty.