My entity relationship diagram consists of 18 tables disregarding the 3 junction tables which are created to establish a many-to-many relationship between two tables.

The ER diagram consists of several types of relations:

**many-to-many**:

1. Teachers and Courses: (Mandatory)

Course can be covered by several teachers and teacher can cover multiple courses.

1. Programs and Courses: (Mandatory)

A program can have a list of courses and a course can be taught in several programs.

1. Lectures and Groups: (Mandatory)

Each group is assigned a list of lectures and a lecture can be attended by several groups at the same time.

**one-to-many:**

Relation Between

1. Teacher and Lectures: (Optional)

A lecture can be given by zero or several teachers but a teacher can only give zero or one lecture at a time

1. Programs and Students: (Mandatory)

A program can have multiple students while a student can only belong to belong to one program.

1. Exam\_Type and Exam: (Mandatory)

An exam can have only one exam type but exam type can be used my several exams.

1. Exam\_Grades and Exam: (Mandatory)

An exam has multiple exam grades but exam grades belong to a single exam

1. Teacher\_Recruitment and Teachers: (Mandatory)

A Teacher can only have one recruitment type but a recruitment type can belong to several teachers.

1. Course and Exam: (Mandatory)

Each course may have one or several exams while each exam can only be belong to one course.

1. Room\_Type and Rooms: (Mandatory)

Each room can have only one room type but room type can be belong to several rooms.

1. Lecture\_Type and Lectures: (Mandatory)

Each Lecture can only have one lecture type while a lecture type can belong to several lectures.

1. Lectures and Lecture\_Attendance: (one mandatory to one optional)

A lecture can have a list of student attendance while lecture attendance only belongs to one lecture.

1. Lecture\_Attendance and Students: (Optional)

A student can have at most one attendance per lecture while lecture attendance can contain list of multiple student attendance

1. Groups and Students: (Mandatory)

Each student belong to a specific group while each group contains several students

1. Intake and Students: (Mandatory)

Each student has only one intake while an intake belongs to several students.

**one-to-one:**

Relation Between

1. Transaction and Students: (Mandatory)

A transaction has to be made by only one student and a student has to make only one transaction

1. Candidates and Transaction: (Optional)

A candidate can make at most one transaction and a transaction can be made by only one candidate

1. Rooms and Lectures: (one mandatory to one optional)

A room can only be occupied by one lecture at a time and a lecture can only be given in one room at a time.