

### III. Extending ER schema with additional constraints

#### Relational schema

a) Secondary keys (a.k.a. UNIQUE constraints). You should add at least two unique constraints, based on your functional dependencies. ✓

b) If you have done everything correctly, you should have a nice schema with at least one problem: It's possible for students to attend one program, and choose a branch from another. Add a constraint that prevents this. In other words, the program of the branch the student selects must be the program the student attends. ✓

**Students** (idnr, login, name, program)

program -> Programs.name

login UNIQUE

(idnr,program) UNIQUE

**StudentBranches** (student, branch, program)

student, program -> Students.(idnr,program)

branch, program -> Branch.(name, program)

**Courses** (code, credits)

**Programs** (name, abbreviation) \*

**ProgramDepartment** (program, department) \*

program -> Programs.name

department -> Departments.name

**Departments** (name, abbreviation) \*

abbreviation UNIQUE

**Branch** (name, program)

program -> Programs.name

**Classification** (name)

**Classified** (course, classification)

course -> Courses.code

classification -> Classification.name

**Taken** (student, course, grade)

student -> Students.idnr

course -> Courses.code

**Registered** (student, course)

student -> Students.idnr

course -> Courses.code

**PrerequisiteCourses** (course, prerequisiteCourse) \*

course -> Courses.code

prerequisiteCourse -> Courses.code

**MandatoryBranch** (course, branch, program)

course -> Courses.code

branch, program -> Branch (name, program)

**MandatoryProgram** (course, program)

course -> Courses.code

program -> Programs.name

**RecommendedBranch** (course, branch, program)

course -> Courses.code

branch, program -> Branch (name, program)

**LimitedCourses** (course, capacity)

course -> Courses.code

**WaitingList** (student, course, position)

student -> Students.idnr

course -> LimitedCourses.code

(course, position) UNIQUE