

Laboratory work 4

1.

a) What are the main phases in the database design? What is done on each development phase?

- Initial phase - characterize fully the data needs of the prospective database users.
- Second phase - when every data requirement is stored and analyzed, the next thing that we need to do is creating a conceptual database plan and choosing a data model.
- Final Phase - implementation of the database from an abstract data model.

b) What is the entity-relationship (ER) data model?

- Models an enterprise as a collection of entities and relationships
 - Entity: a “thing” or “object” in the enterprise that is distinguishable from other objects
- Described by a set of attributes
 - Relationship: an association among several entities.

2.

a) Create entity “**Student**” with at least **5 attributes** (One for each type of attribute: **simple**, **composite**, **derived**, **multivalued**)

Student
<i>student_id</i>
<i>name</i>
<i>first_name</i>
<i>last_name</i>
<i>address</i>
<i>street</i>
<i>home_number</i>
<i>city</i>
<i>region</i>
<i>date_of_birth</i>
<i>age()</i>
{ <i>phone_number</i> }

b) Create entities “**University**”, “**Course**”, “**Dormitory**”, “**Teacher**”, “**Office of the Registrar**” with at least 3 attributes each. (Entity types should be correct on data model)

University
<i>name</i>
<i>students</i>
<i>faculties</i>

Course
<i>title</i> <i>instructors</i> <i>credits</i>

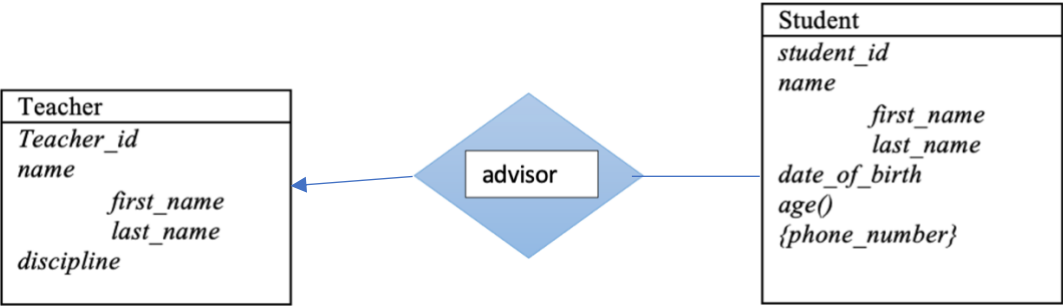
Dormitory
<i>university</i> <i>address</i> <i>capacity</i>

Teacher
<i>Teacher_id</i> <i>name</i> <i>first_name</i> <i>last_name</i> <i>discipline</i>

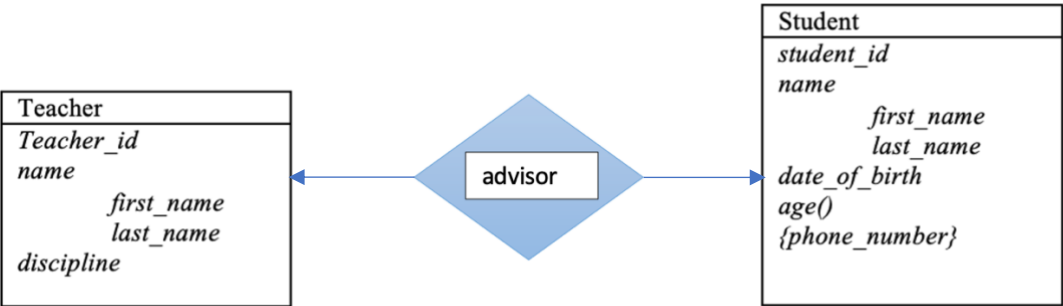
Office of the Registrar
<i>name</i> <i>first_name</i> <i>last_name</i> <i>{phone_number}</i> <i>{email_address}</i>

3. Give examples for **one-to-many**, **one-to-one**, **many-to-many**, **many-to-one** relations. (Draw the examples as a scheme)

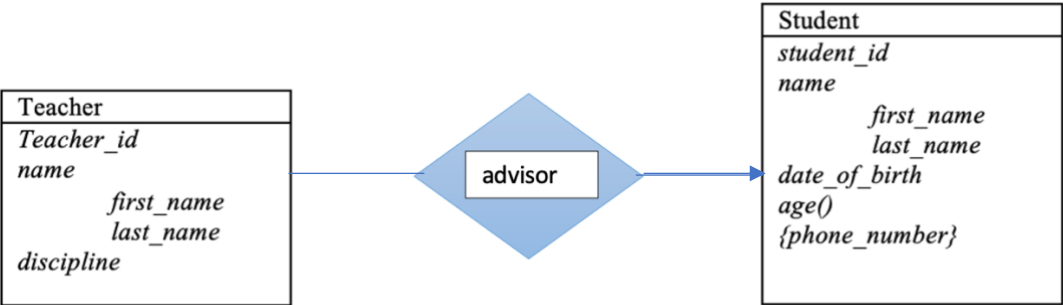
one-to-many



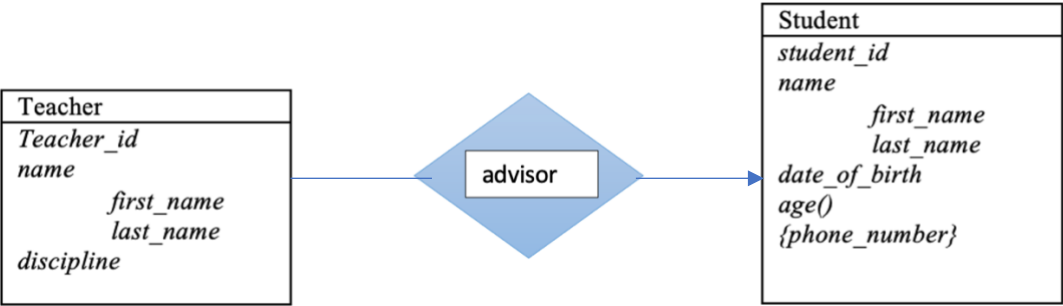
one-to-one



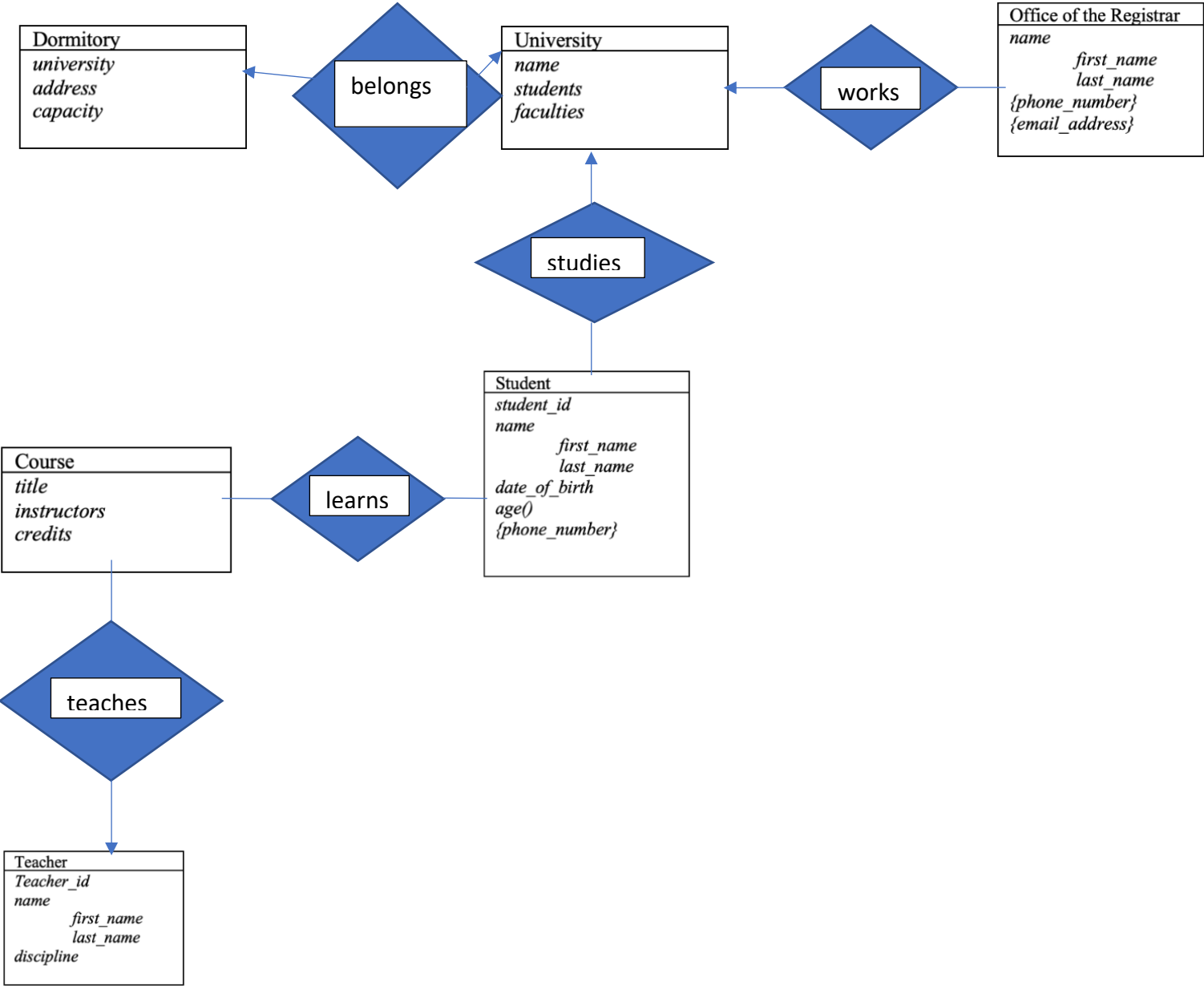
many-to-many



many-to-one



4. Create ER data model with relations using data from the second task.



5. Create ER data model for IT company. (At least 5 entities and 8 relations)

