a) 3 phases. Initial phase – characterize fully the data needs of the prospective database users.

Second phase -- choosing a data model

• Applying the concepts of the chosen data model

• Translating these requirements into a conceptual schema of the database.

• A fully developed conceptual schema indicates the functional requirements of the enterprise.

▪ Describe the kinds of operations (or transactions) that will be performed on the data.

Final Phase -- Moving from an abstract data model to the implementation of the database

• Logical Design – Deciding on the database schema.

▪ Database design requires that we find a “good” collection of relation schemas.

▪ Business decision – What attributes should we record in the database?

▪ Computer Science decision – What relation schemas should we have and how should the attributes be distributed among the various relation schemas?

• Physical Design – Deciding on the physical layout of the database

b)

Entity Relationship Model (covered in this chapter)

• 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

2) a)

Student
ID name first_name last_name Age dode_of_birth adress city street

b)

Course
ID name credits

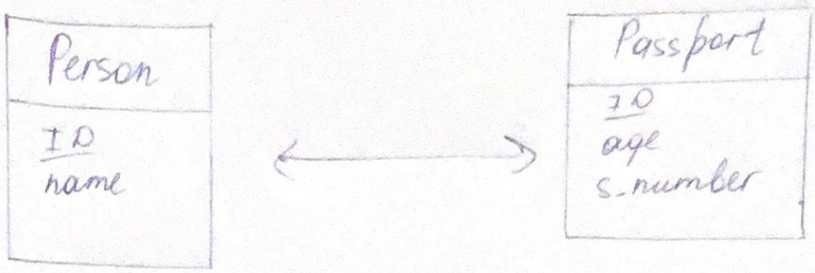
University
ID name faculty

dormitory
ID name corpus r_number

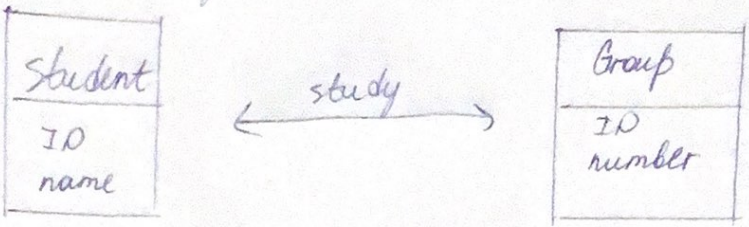
Office_of_the_registrator
sector transcript faculty manager

teacher
ID name age course

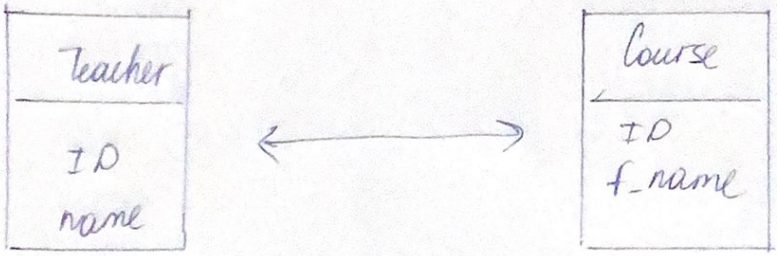
3) One-to-one



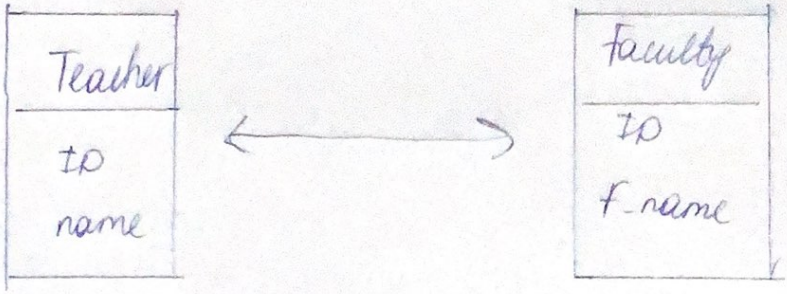
One-to-many



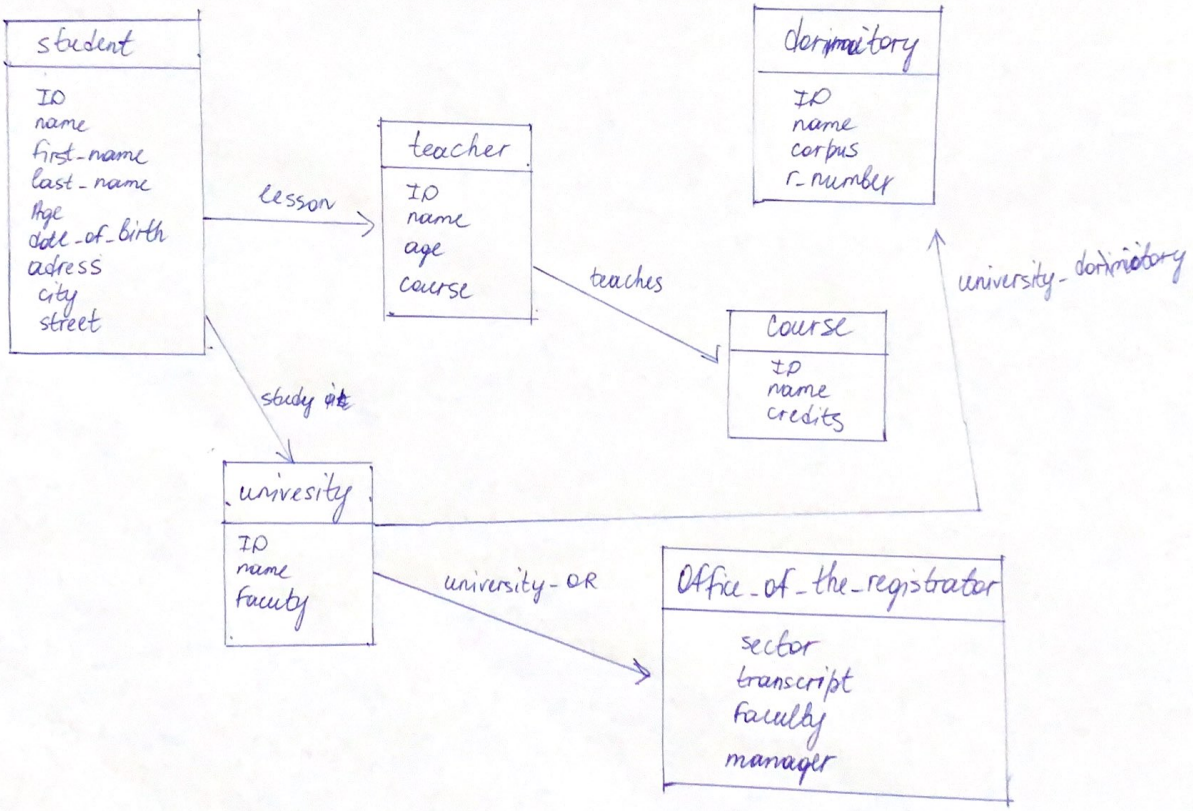
Many-to-many



Many-to-one



4)


student
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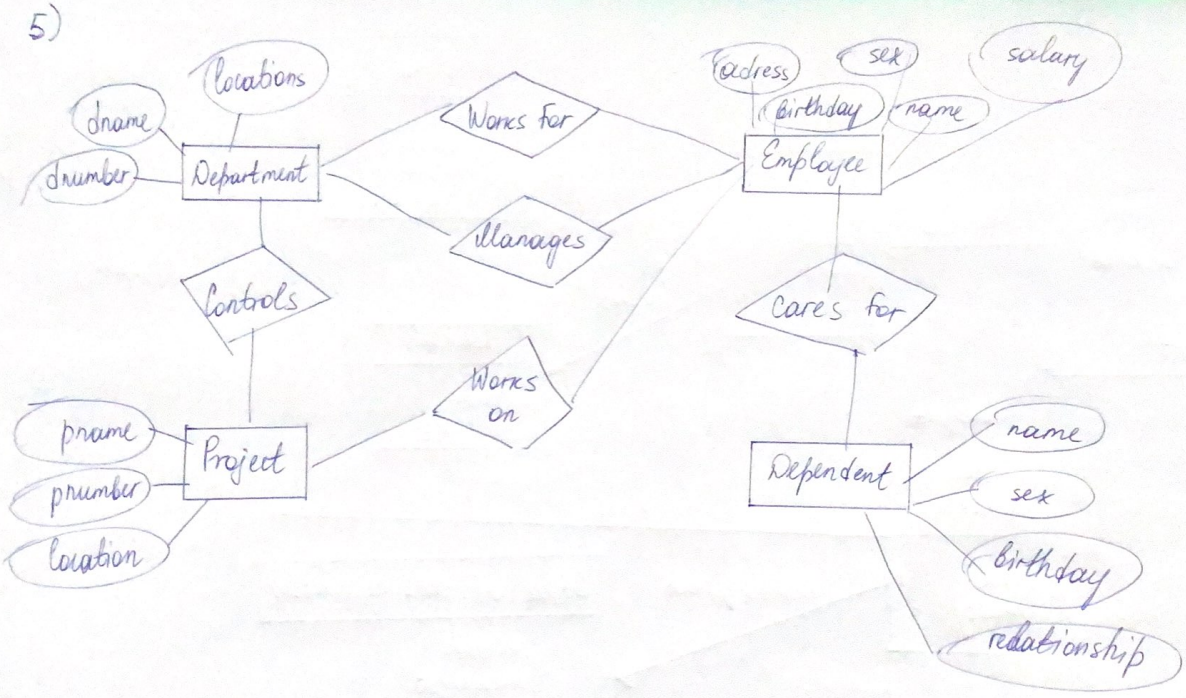
name
first_name
last_name
age
date_of_birth
address
city
street
lesson
teacher
ID
name
age
course
teaches
course
ID
name
credits
dormitory
ID
name
corpus
r_number
university_dormitory
study
university
ID
name
faculty
university_OR
Office_of_the_registrator
sector
transcript
faculty
manager

5)


locations
dname
dnumber
Department
Works for
Manages
Controls
Employee
address
sex
salary
birthday
name
Cares for
Works on
pname
pnumber
location
Project
Dependent
name
sex
birthday
relationship