1.

a) There are in total three main phases in the database design:

Initial phase – determining what data you will be dealing with;

Second phase – determining the data model you will be using, making a conceptual schema of the future database. Describing the functionality of the database.

Final phase – implementation of the database, consists of two parts:

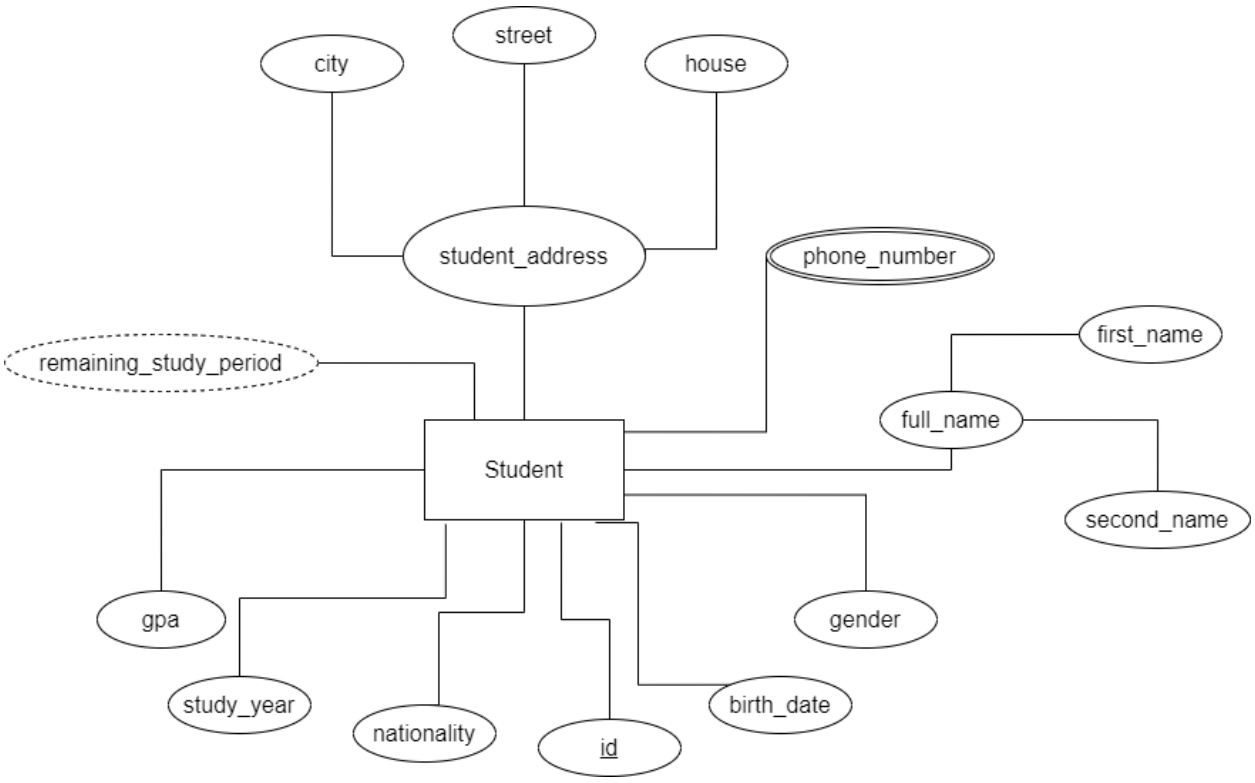
First is logical design – constructing the database schema, what relations should be created, what attributes they should consist of, process of transferring a conceptual schema into a schema for the data model of a chosen DBMS.

Second is physical design – transferring entities into relations, instances into rows, attributes into columns. While this process, you should ensure avoiding data redundancies.

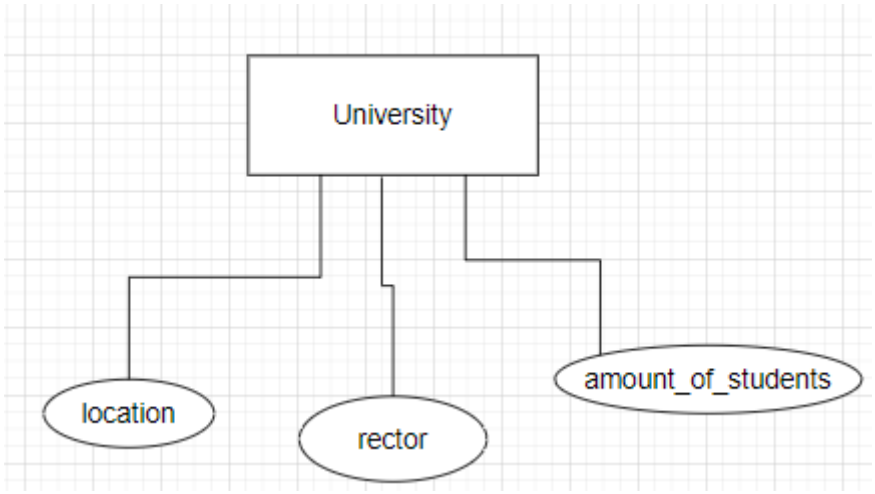
b) Entity Relationship Model – is a graphical approach to database design. ER model consists of entities and relationships. Entity is described by a set of attributes.

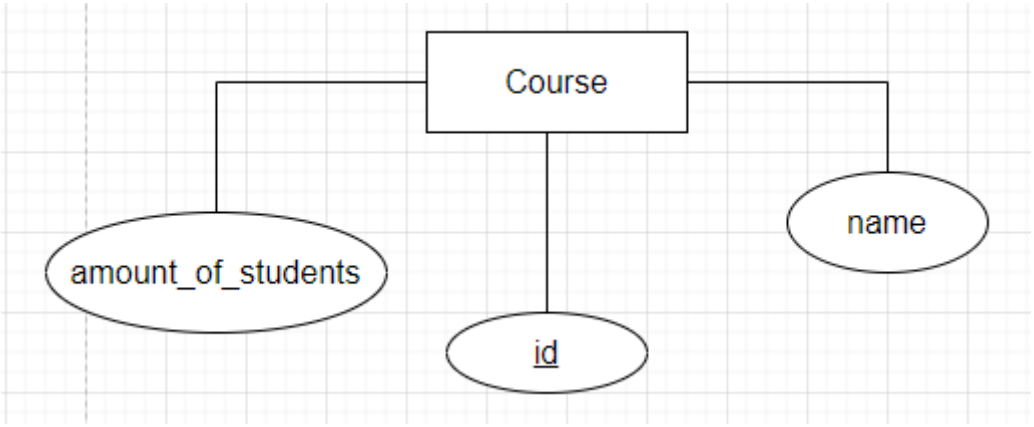
2.

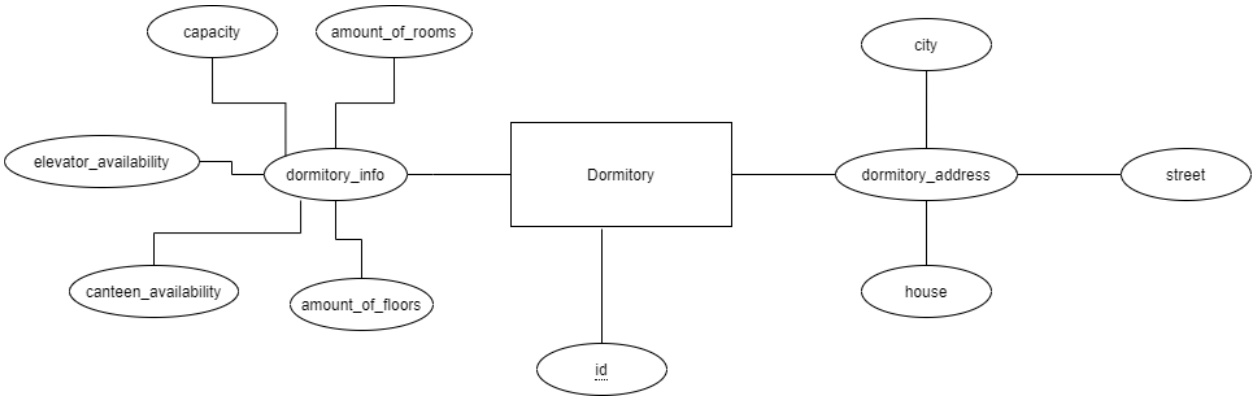
a)

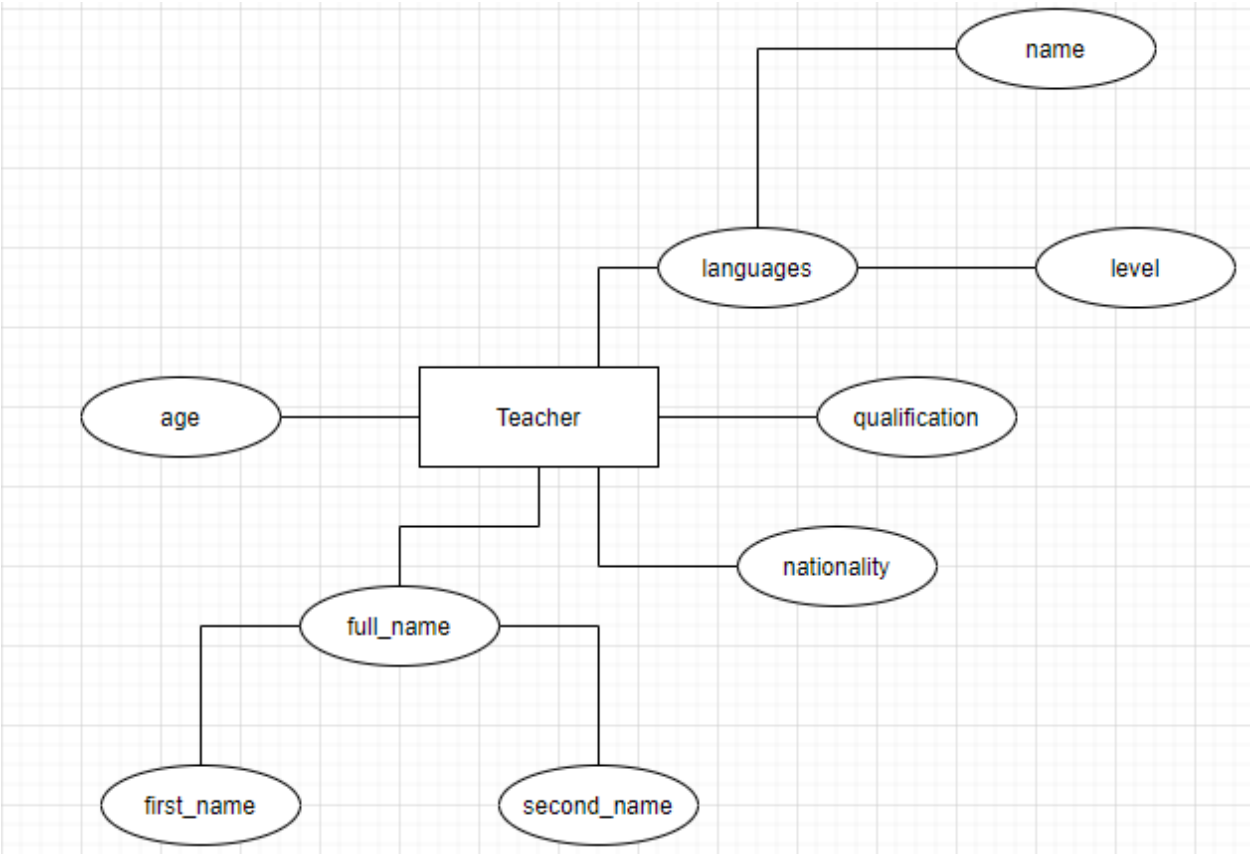

street
city
house
student_address
phone_number
first_name
remaining_study_period
full_name
Student
second_name
gpa
gender
study_year
nationality
id
birth_date

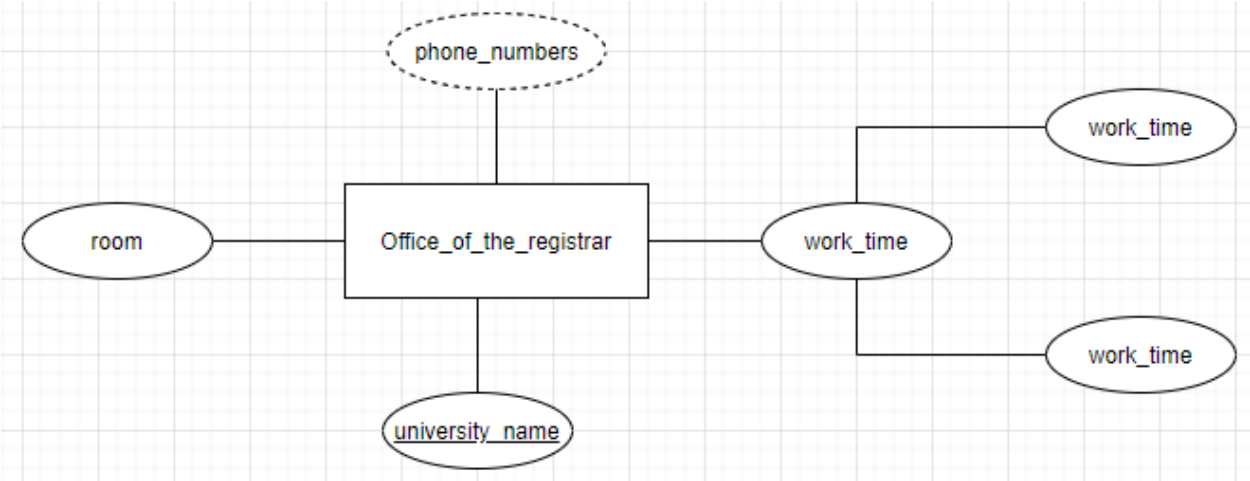
b)


University
location
rector
amount_of_students


Course
amount_of_students
id
name

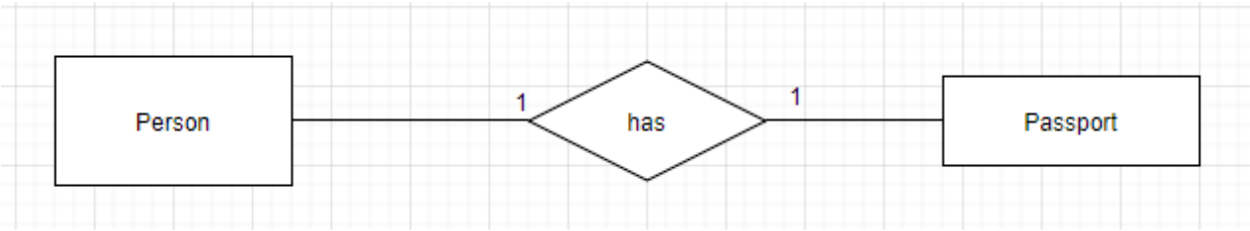

capacity
amount_of_rooms
city
elevator_availability
dormitory_info
Dormitory
dormitory_address
street
canteen_availability
amount_of_floors
house
id


name
languages
level
age
Teacher
qualification
nationality
full_name
first_name
second_name

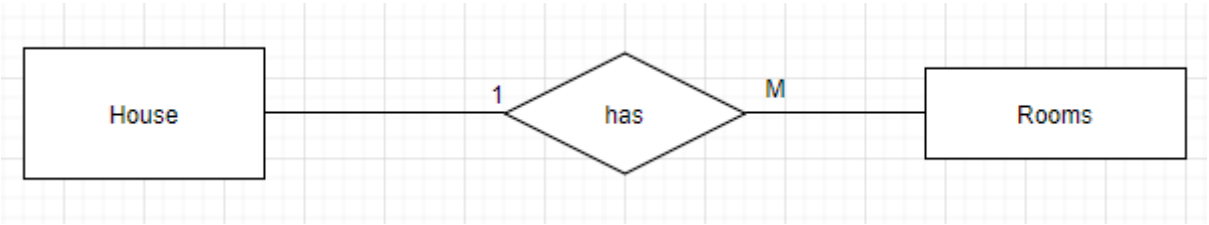


3.

One to One:

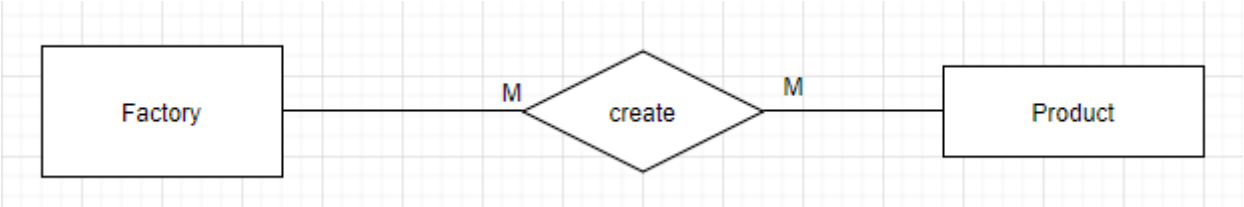


One to Many:

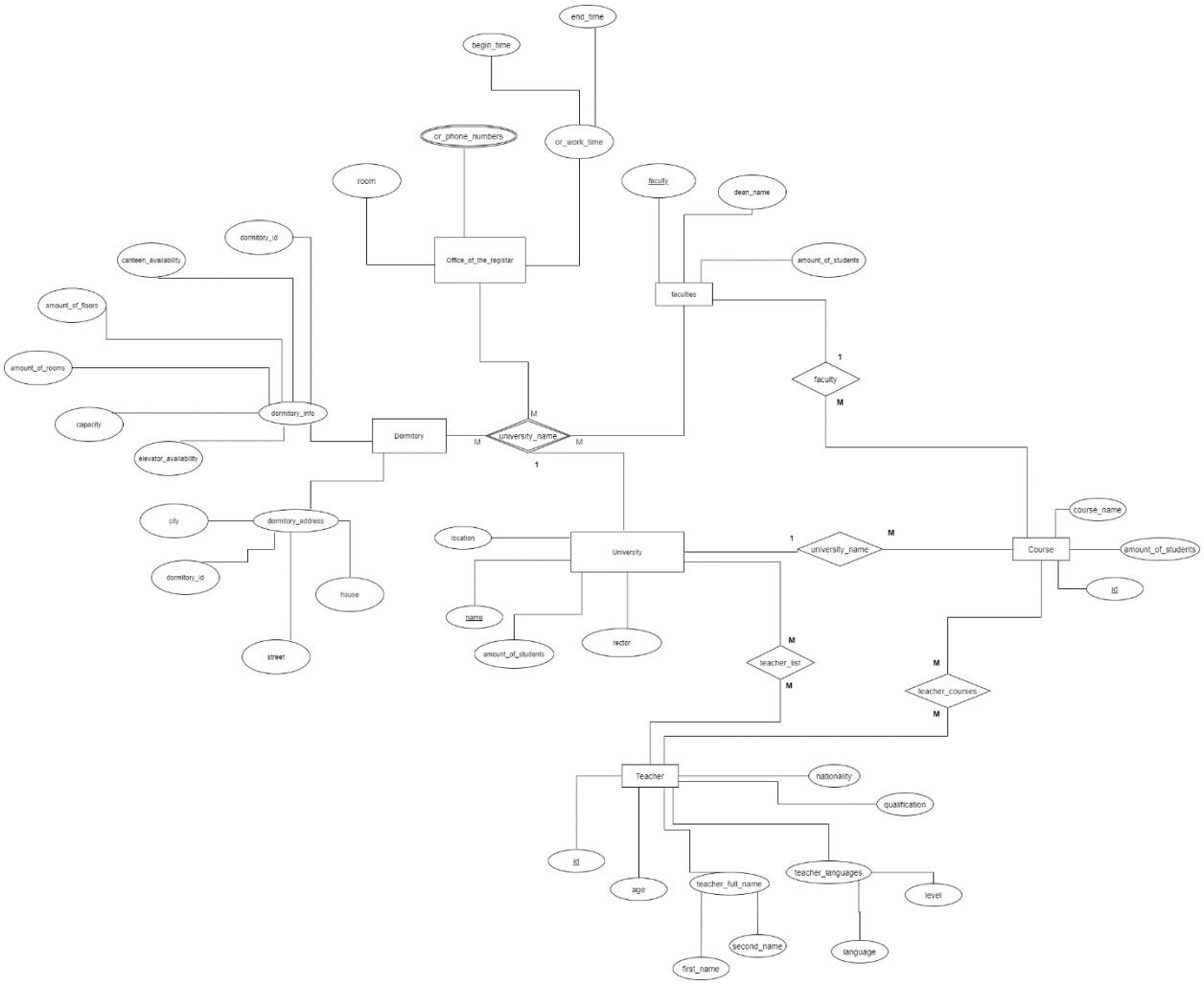


Many to One:

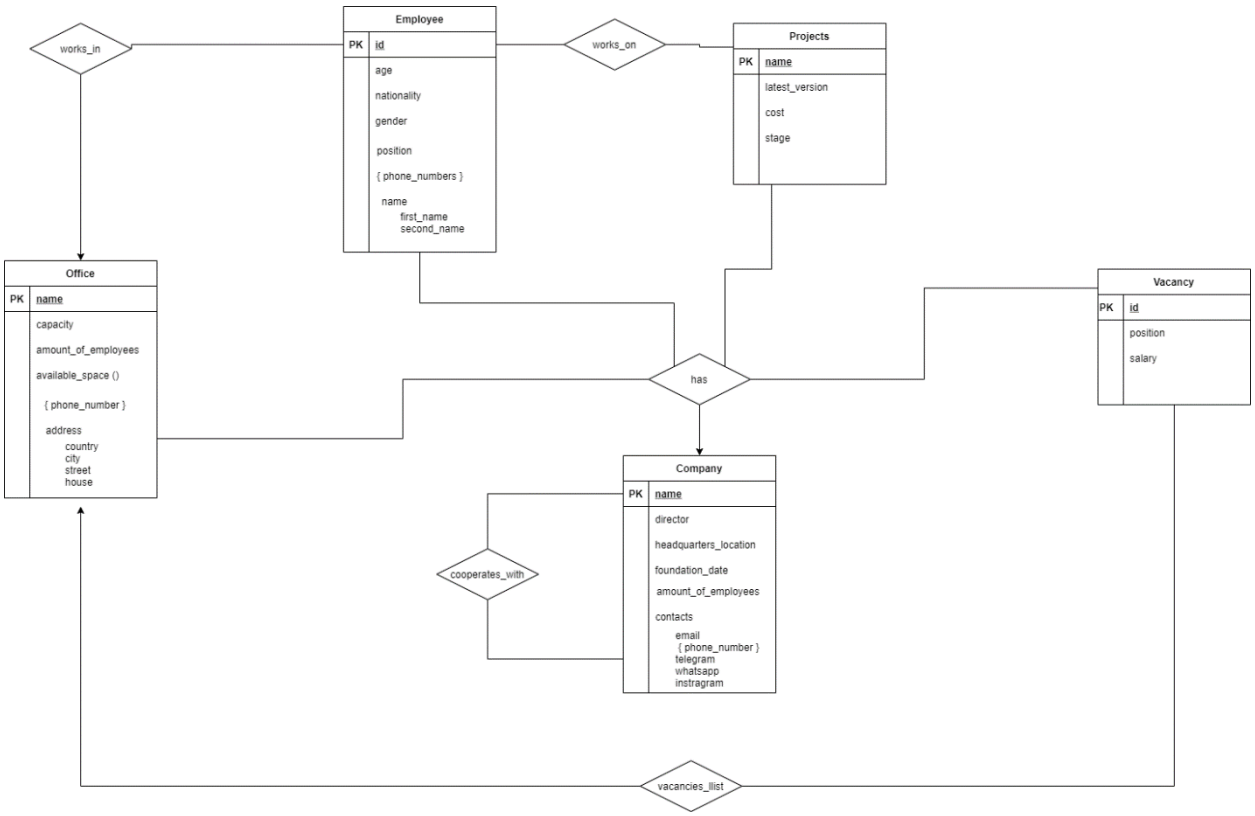
Many to Many:


Factory
M
create
M
Product

Task 4.


end_time
begin_time
cr_phone_numbers
cr_work_time
room
faculty
dean_name
dormitory_id
canteen_availability
Office_of_the_registar
amount_of_students
faculties
amount_of_floors
amount_of_rooms
1
faculty
M
dormitory_info
capacity
elevator_availability
Dormitory
M
university_name
M
M
1
city
dormitory_address
location
University
1
university_name
M
Course
course_name
amount_of_students
id
dormitory_id
house
name
amount_of_students
rector
M
teacher_list
M
M
teacher_courses
M
Teacher
nationality
qualification
id
age
teacher_full_name
teacher_languages
level
second_name
language
first_name

Task 5.


Employee
PK
id
age
nationality
gender
position
{ phone_numbers }
name
first_name
second_name
works_in
works_on
Projects
PK
name
latest_version
cost
stage
Office
PK
name
capacity
amount_of_employees
available_space ()
{ phone_number }
address
country
city
street
house
has
Vacancy
PK
id
position
salary
Company
PK
name
director
headquarters_location
foundation_date
amount_of_employees
contacts
email
{ phone_number }
telegram
whatsapp
instragram
cooperates_with
vacancies_llist