Міністерство освіти і науки України

Харківський національний університет імені В.Н. Каразіна
Кафедра теоретичної та прикладної інформатики

Звіт по дисципліні
Вступ до SQL баз даних

Індивідуальне завдання № 1

Студента: Чистякова Артема
Групи: МФ-31

Необхідний термін здачі завдання: 01.10.2020

Фактичний термін здачі завдання: _____

Кількість балів: _____

Харків 2020

Постановка задачи

Разработать базу данных для хранения и обработки информации о внутреннем устройстве некоторой небольшой аутсорс IT-компании.

Компания хоть и небольшая, но может располагать несколькими филиалами. В каждом из офисов работают: менеджеры, программисты и дизайнеры. У каждого менеджера в подчинении могут находится другие менеджеры, а также программисты и дизайнеры. У каждого программиста может быть программист ментор высшей должности.

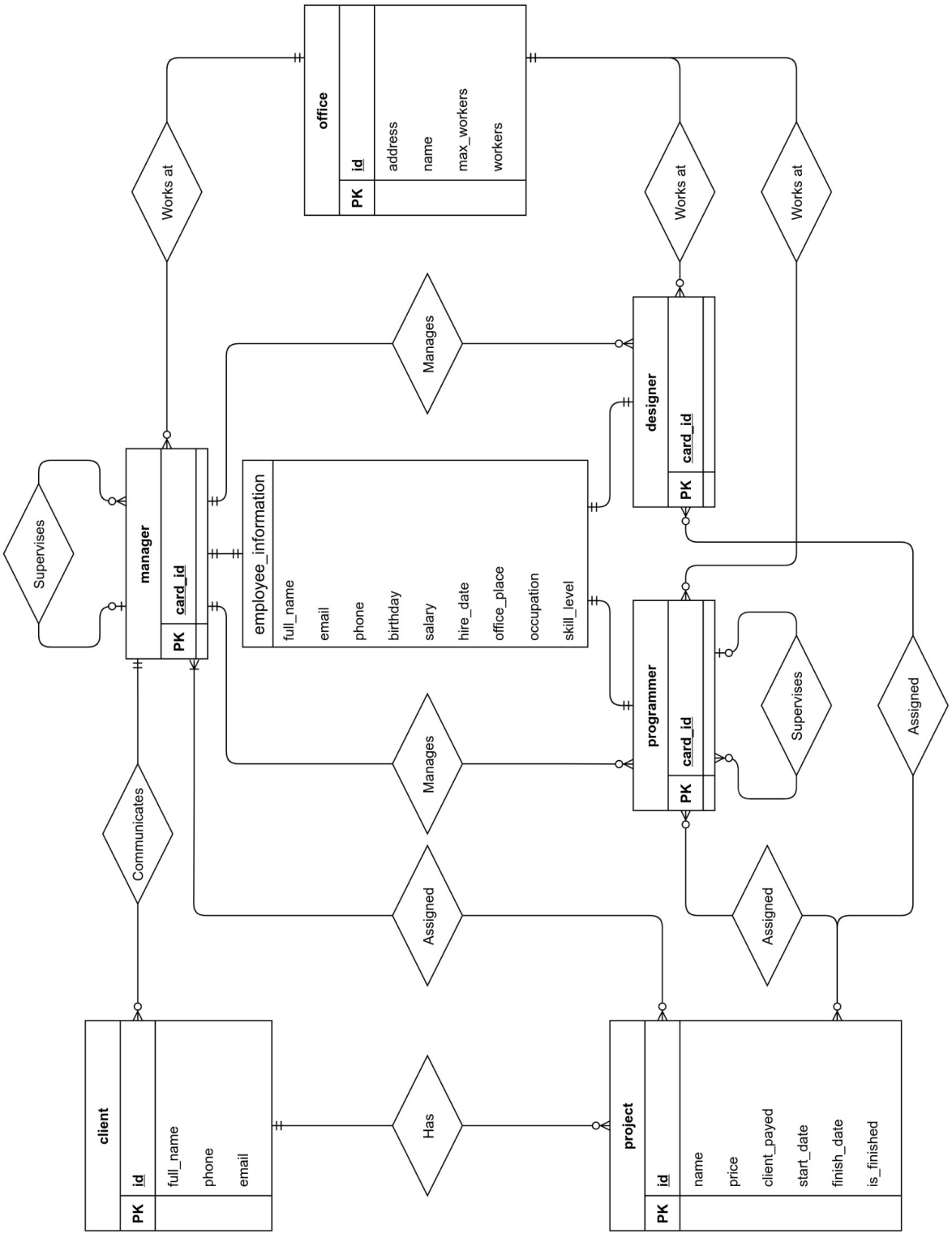
В компанию поступают заказы от клиентов в качестве проектов. Каждому клиенту предоставляется менеджер для общения, и над поступившими проектами начинается работа. В проекте могут быть задействованы менеджеры, программисты и дизайнеры.

В базе данных должна храниться информация о каждом сотруднике, это личные данные, зарплата, место в офисе и направление работы (для программиста, например, Java или C++).

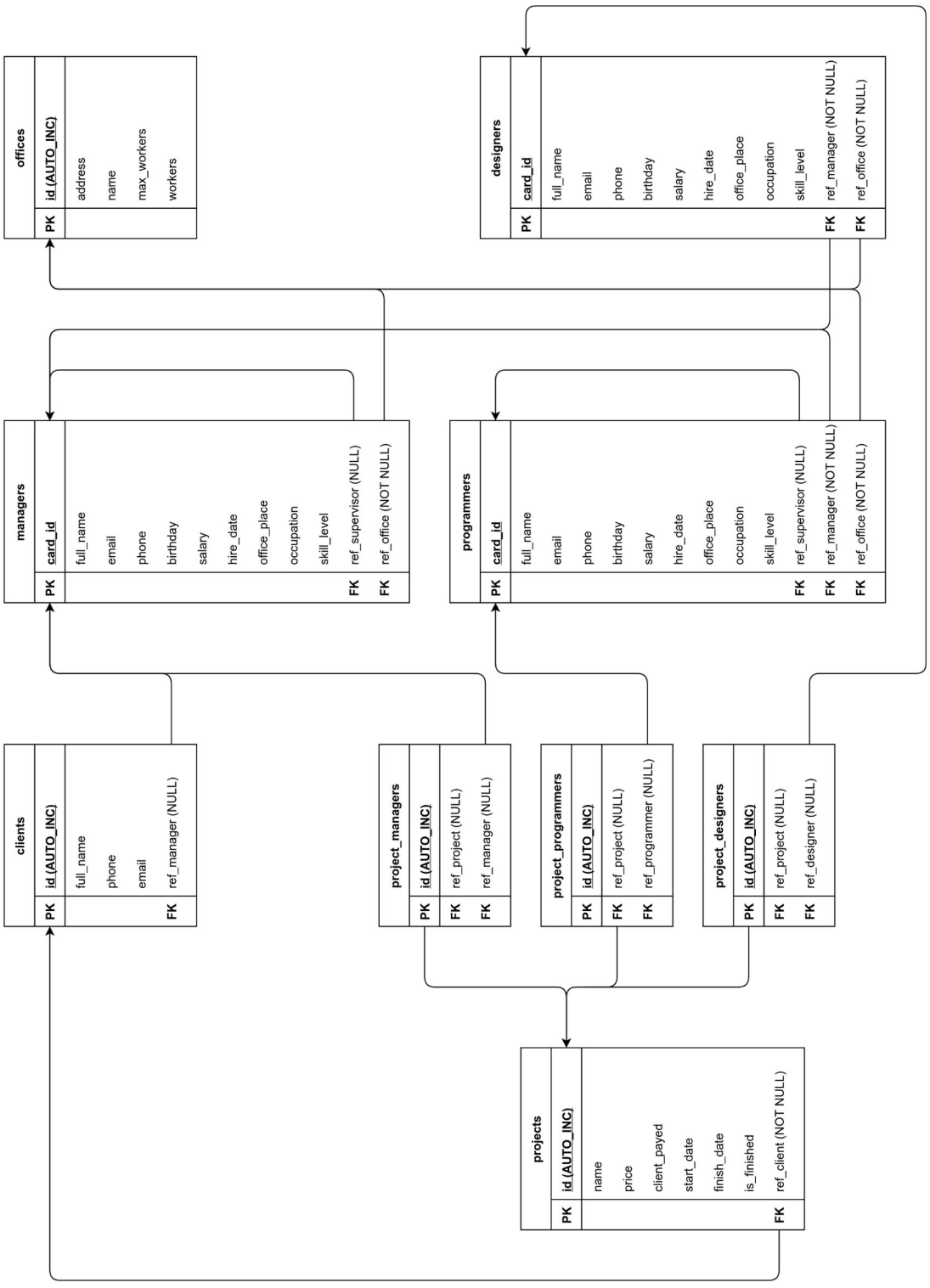
О проектах в базе данных тоже должна храниться информация, это стоимость проекта, текущая оплата клинта, время начала работы и дедлайн.

В базе данных также должна храниться информация о офисе.

Концептуальная модель БД



Представление БД в качестве таблиц и связей



Перечень запросов на создание объектов БД

```
CREATE DATABASE university_task;
USE university_task;

CREATE TABLE offices (
        id INT PRIMARY KEY NOT NULL AUTO_INCREMENT,
        address VARCHAR(100),
        name VARCHAR(100),
        max_workers INT,
        workers INT);

CREATE TABLE clients (
        id INT PRIMARY KEY NOT NULL AUTO_INCREMENT,
        full_name VARCHAR(100),
        phone VARCHAR(50),
        email varchar(50),
        ref_manager INT NULL);

CREATE TABLE projects (
        id INT PRIMARY KEY NOT NULL AUTO_INCREMENT,
        name VARCHAR(100),
        price FLOAT,
        client_payed FLOAT,
        start_date DATE,
        finish_date DATE,
        is_finished BOOLEAN,
        ref_client INT NOT NULL);

CREATE TABLE managers (
        card_id INT PRIMARY KEY NOT NULL,
        full_name VARCHAR(100),
        email VARCHAR(50),
        phone VARCHAR(50),
        birthday DATE,
        salary FLOAT,
        hire_date DATE,
        office_place INT,
        occupation VARCHAR(100),
        skill_level VARCHAR(50),
        ref_supervisor INT NULL,
        ref_office INT NOT NULL);

CREATE TABLE programmers (
        card_id INT PRIMARY KEY NOT NULL,
        full_name VARCHAR(100),
        email VARCHAR(50),
        phone VARCHAR(50),
        birthday DATE,
        salary FLOAT,
```

```
        hire_date DATE,
        office_place INT,
        occupation VARCHAR(100),
        skill_level VARCHAR(50),
        ref_supervisor INT NULL,
        ref_manager INT NOT NULL,
        ref_office INT NOT NULL);

CREATE TABLE designers (
        card_id INT PRIMARY KEY NOT NULL,
        full_name VARCHAR(100),
        email VARCHAR(50),
        phone VARCHAR(50),
        birthday DATE,
        salary FLOAT,
        hire_date DATE,
        office_place INT,
        occupation VARCHAR(100),
        skill_level VARCHAR(50),
        ref_manager INT NOT NULL,
        ref_office INT NOT NULL);

CREATE TABLE project_managers (
        id INT PRIMARY KEY NOT NULL AUTO_INCREMENT,
        ref_project INT NULL,
        ref_manager INT NULL);

CREATE TABLE project_programmers (
        id INT PRIMARY KEY NOT NULL AUTO_INCREMENT,
        ref_project INT NULL,
        ref_programmer INT NULL);

CREATE TABLE project_designers (
        id INT PRIMARY KEY NOT NULL AUTO_INCREMENT,
        ref_project INT NULL,
        ref_designer INT NULL);

ALTER TABLE clients ADD CONSTRAINT constr_clients_managers FOREIGN KEY
(ref_manager) REFERENCES managers (card_id);

ALTER TABLE projects ADD CONSTRAINT constr_projects_clients FOREIGN KEY (ref_client)
REFERENCES clients (id);

ALTER TABLE managers ADD CONSTRAINT constr_managers_managers FOREIGN KEY
(ref_supervisor) REFERENCES managers (card_id);
ALTER TABLE managers ADD CONSTRAINT constr_managers_offices FOREIGN KEY
(ref_office) REFERENCES offices (id);

ALTER TABLE programmers ADD CONSTRAINT constr_programmers_managers FOREIGN
KEY (ref_manager) REFERENCES managers (card_id);
```

```
ALTER TABLE programmers ADD CONSTRAINT constr_programmers_programmers FOREIGN KEY (ref_supervisor) REFERENCES programmers (card_id);
ALTER TABLE programmers ADD CONSTRAINT constr_programmers_offices FOREIGN KEY (ref_office) REFERENCES offices (id);

ALTER TABLE designers ADD CONSTRAINT constr_designers_managers FOREIGN KEY (ref_manager) REFERENCES managers (card_id);
ALTER TABLE designers ADD CONSTRAINT constr_designers_offices FOREIGN KEY (ref_office) REFERENCES offices (id);

ALTER TABLE project_managers ADD CONSTRAINT constr_project_managers_projects FOREIGN KEY (ref_project) REFERENCES projects (id);
ALTER TABLE project_managers ADD CONSTRAINT constr_project_managers_managers FOREIGN KEY (ref_manager) REFERENCES managers (card_id);

ALTER TABLE project_programmers ADD CONSTRAINT constr_project_programmers_projects FOREIGN KEY (ref_project) REFERENCES projects (id);
ALTER TABLE project_programmers ADD CONSTRAINT constr_project_programmers_programmers FOREIGN KEY (ref_programmer) REFERENCES programmers (card_id);

ALTER TABLE project_designers ADD CONSTRAINT constr_project_designers_projects FOREIGN KEY (ref_project) REFERENCES projects (id);
ALTER TABLE project_designers ADD CONSTRAINT constr_project_designers_designers FOREIGN KEY (ref_designer) REFERENCES designers (card_id);
```

Таблицы с заполненными данными

Clients:

id	full_name	phone	email	ref_manager
1	Alfred Hitchcock	+20	alfred@gmail.com	2
2	Leonardo DiCaprio	+22	leo@gmail.com	1
3	Coco Chanel	+25	coco@gmail.com	3

Offices:

id	address	name	max_workers	workers
1	Earth	Green office	20000	7
2	Venus	Sweaty office	10000	3
3	Mars	Windy office	10000	3
4	Pluto	Slippery office	10000	2
5	Jupiter	HUGE office	100000	0

Projects:

id	name	price	client_payed	start_date	finish_date	is_finished	ref_client
1	Journey to Mars	1000000	0	Tue Sep 10 2019 00:00:00 GMT+0300 (Eastern European Summer Time)	Wed Sep 10 2025 00:00:00 GMT+0300 (Eastern European Summer Time)	0	1
2	Cool down the Sun	10000000	0	Thu Sep 10 2020 00:00:00 GMT+0300 (Eastern European Summer Time)	Sat Sep 10 2050 00:00:00 GMT+0300 (Eastern European Summer Time)	0	2
3	2+2=5	10000	0	Sat Oct 10 2020 00:00:00 GMT+0300 (Eastern European Summer Time)	Tue Nov 10 2020 00:00:00 GMT+0200 (Eastern European Standard Time)	0	3
4	Rialbit.com	50000	0	Thu Oct 01 2020 00:00:00 GMT+0300 (Eastern European Summer Time)	Fri Oct 01 2021 00:00:00 GMT+0300 (Eastern European Summer Time)	0	1
5	Google.com	1000000	0	Sat Apr 01 2000 00:00:00 GMT+0300 (Eastern European Summer Time)	null	0	3

Managers:

card_id	full_name	email	phone	birthday	salary	hire_date	office_place	occupation	skill_level	ref_supervisor	ref_office
1	Donald Trump	donald@gmail.com	+1	Thu Jan 01 1970 00:00:00 GMT+0300 (Eastern European Standard Time)	10000	Wed Jan 01 2020 00:00:00 GMT+0200 (Eastern European Standard Time)	1	Project manager	Senior	null	2
2	Angelina Jolie	jolie@gmail.com	+2	Tue Jan 01 1980 00:00:00 GMT+0300 (Eastern European Standard Time)	5000	Wed Jan 01 2020 00:00:00 GMT+0200 (Eastern European Standard Time)	2	Project manager	Senior	null	2
3	Abraham Linkoln	linkoln@gmail.com	+3	Sun Jan 01 1809 00:00:00 GMT+0220 (Eastern European Standard Time)	2000	Wed Jan 01 2020 00:00:00 GMT+0200 (Eastern European Standard Time)	3	Sales manager	Middle	1	2
4	Brad Pitt	pitt@gmail.com	+4	Sun Feb 01 1970 00:00:00 GMT+0300 (Eastern European Standard Time)	500	Fri Jan 01 2010 00:00:00 GMT+0200 (Eastern European Standard Time)	4	Sales manager	Junior	3	1
5	Will Simth	smith@gmail.com	+5	Mon Feb 01 1960 00:00:00 GMT+0300 (Eastern European Standard Time)	750	Fri Jan 01 2016 00:00:00 GMT+0200 (Eastern European Standard Time)	1	Sales manager	Junior	3	1

Programmers:

card_id	full_name	email	phone	birthday	salary	hire_date	office_place	occupation	skill_level	ref_supervisor	ref_manager	ref_office
1	Bill Gates	gates@gmail.com	+6	Mon Feb 01 1960 00:00:00 GMT+0300 (Eastern European Standard Time)	400	Mon Jan 01 2018 00:00:00 GMT+0200 (Eastern European Standard Time)	2	C++ programmer	Junior	2	2	1
2	Linus Torvalds	linus@gmail.com	+7	Mon Feb 01 1965 00:00:00 GMT+0300 (Eastern European Standard Time)	10000	Thu Jan 01 2009 00:00:00 GMT+0200 (Eastern European Standard Time)	3	C programmer	Senior	null	1	1
3	Alan Turing	turing@gmail.com	+8	Mon Jan 01 1900 00:00:00 GMT+0220 (Eastern European Standard Time)	8000	Mon Jan 01 2007 00:00:00 GMT+0200 (Eastern European Standard Time)	1	Machine code	Senior	null	3	3
4	Larry Page	page@gmail.com	+9	Tue Jan 01 1985 00:00:00 GMT+0300 (Eastern European Standard Time)	2000	Mon Jan 01 2007 00:00:00 GMT+0200 (Eastern European Standard Time)	4	Java	Middle	3	4	3
5	Mark Zuckerberg	mark@gmail.com	+10	Wed Jan 01 1986 00:00:00 GMT+0300 (Eastern European Standard Time)	1000	Fri Jan 01 2010 00:00:00 GMT+0200 (Eastern European Standard Time)	5	Solidity	Junior	2	1	3

Designers:

card_id	full_name	email	phone	birthday	salary	hire_date	office_place	occupation	skill_level	ref_manager	ref_office
1	Elon Musk	musk@gmail.com	+11	Thu Jan 01 1976 00:00:00 GMT+0300 (Eastern European Standard Time)	10000	Wed Jan 01 2014 00:00:00 GMT+0200 (Eastern European Standard Time)	1	Abode	Senior	5	4
2	Hillary Rodham Clinton	clinton@gmail.com	+12	Sun Jan 01 1950 00:00:00 GMT+0300 (Eastern European Standard Time)	1000	Tue Jan 01 2019 00:00:00 GMT+0200 (Eastern European Standard Time)	2	Blender	Junior	5	4
3	George Clooney	clooney@gmail.com	+13	Sat Jan 01 1955 00:00:00 GMT+0300 (Eastern European Standard Time)	4000	Sun Apr 01 2018 00:00:00 GMT+0300 (Eastern European Summer Time)	3	3Ds Max	Middle	3	1
4	Tiger Woods	woods@gmail.com	+14	Sat Jan 01 1977 00:00:00 GMT+0300 (Eastern European Standard Time)	9000	Mon Apr 01 2019 00:00:00 GMT+0300 (Eastern European Summer Time)	3	Maya	Senior	4	1
5	David Beckham	beckham@gmail.com	+15	Sun Jan 01 1984 00:00:00 GMT+0300 (Eastern European Standard Time)	5000	Wed Apr 01 2020 00:00:00 GMT+0300 (Eastern European Summer Time)	5	Blender	Middle	2	1

Project_managers:

id	ref_project	ref_manager
1	1	2
2	2	1
3	3	3
4	3	4
5	4	5

Project_programmers:

id	ref_project	ref_programmer
1	1	1
2	1	2
3	2	3
4	4	5
5	5	4
6	2	2

Project_designers:

id	ref_project	ref_designer
1	5	2
2	5	3
3	1	1
4	2	2
5	3	4