UNIVERSITY MANAGEMENT SYSTEM

Database

Information &
Communication technologies.
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System Requirement Analysis(SRA).

Problem definition. The university management has to handle records for many number of students and maintenance was difficult.

Proposed system. By developing the University management database we can attain the following features:

- Easy to handle and flexible;
- Cost reduction;
- Fast and convenient;
- Data analysis;

Project description. A database is a system for storing and processing data. In our case, we manage a university database, whose purpose is to display information under the requirements of a user or program. The database gives us such advantages as data analysis, their integrity, accuracy, and we can update this data with subsequent use. This database should perform simple queries such as:

- List of students according to certain criteria;
- Monitoring progress; Club activity of stundets;
- The names of the disciplines and the names of the teachers who teach this discipline;
- List of departments and their employees;
- Student city;
- Student's school;
- The presence of a certain type of grant or its absence;
- Student educational program;
- GPA;
- Sort all this information as you use it;

The main users of this database are managers of this organization, who will need information from the database for further research, and monitoring the educational process.

Input data is available in the database. The database contains data for all tables that you can see in the ERD (University, Department, Student department, Gpa, club, student, city, school, teacher, disciplines, grantt).

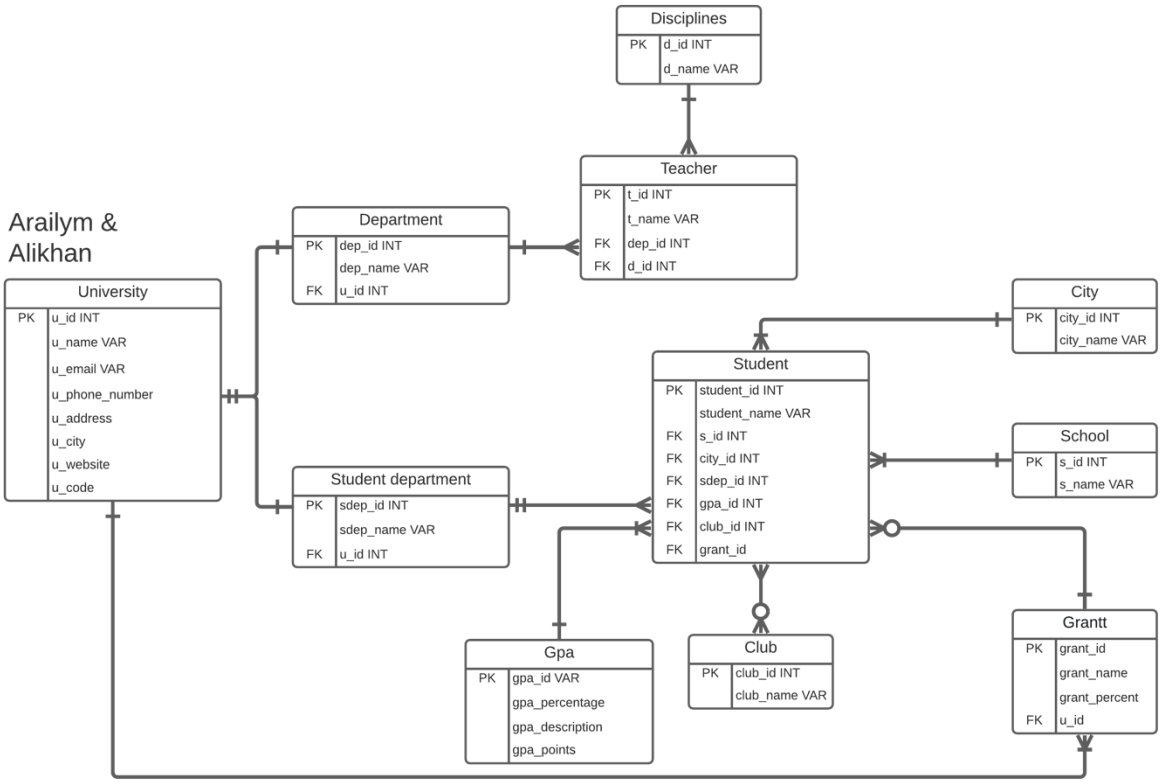
Information which should be stored in the database. This database should store information about names and their identifiers, as well as additional attributes of the tables that make up this database. The purpose of every database is to store information, texts, images, even media files. All dynamic modern websites rely on one or more databases for storing articles and other published content, information about the users, contact information, connections to other websites, ads, etc. In our case, this is data about students, such as city, group, grade, grant, school, data about teachers and the disciplines they teach, about the university and its departments.

Purpose of the project. This project helps in maintaining the database of the students in any educational organization. We can easily access any students information anytime and can be kept safely for long period of-time without any damage.
The project involves designing a complete database management system to address a practical database need and implementing a relational database based on that design. Our database

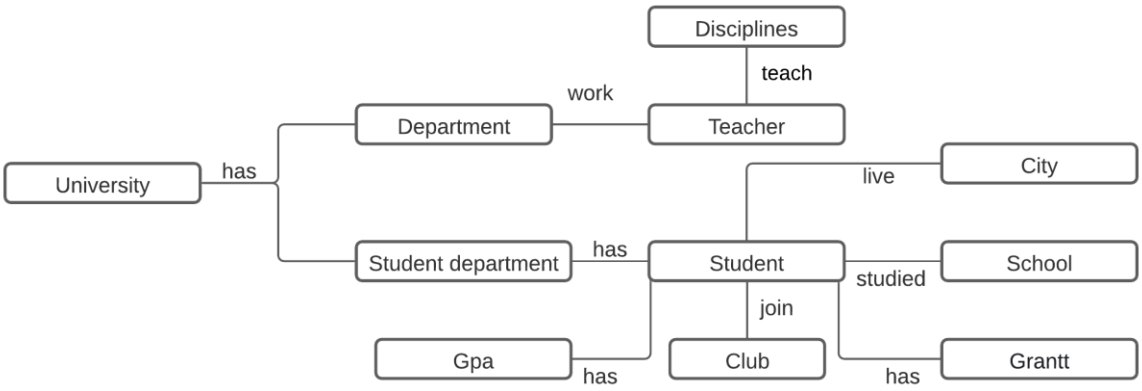
system should be designed to perform general information management tasks such as systematic collection, update, and retrieval of information for a small organization.

Create ERD.

lucid.app https://lucid.app/



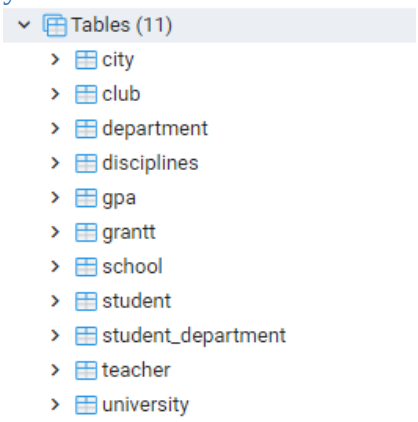
lucid.app https://lucid.app/



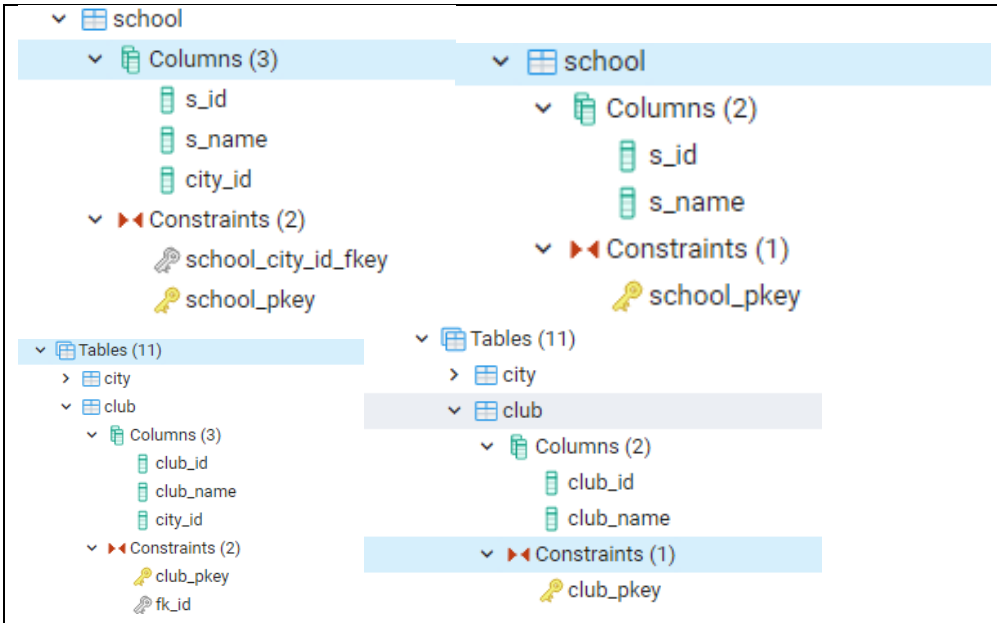
Create database. \\ A database is a collection of related data that is stored off a computer and organized in a manner that enables information to be retrieved as needed. When first creating a database, you would create the database file first using a program like Access. Access has many different types of objects to be created.

create table university (u_id int, u_name varchar, u_email varchar, u_phone_number varchar, u_address varchar, u_city varchar, u_website varchar, u_code int, primary key (u_id));

create table department(dep_id int, dep_name varchar, u_id int, primary key(dep_id), foreign key (u_id) references university(u_id));
create table disciplines(d_id int, d_name varchar, primary key (d_id));
create table teacher(t_id int, t_name varchar, dep_id int, d_id int, primary key (t_id), foreign key(dep_id) references department(dep_id), foreign key(d_id) references disciplines(d_id));
create table student_department(sdep_id int, sdep_name varchar, u_id int, primary key(sdep_id), foreign key(u_id) references university(u_id));
create table gpa(gpa_id varchar, gpa_percentage varchar, gpa_description varchar, gpa_points varchar, primary key (gpa_id));
create table club(club_id int, club_name varchar, primary key (club_id));
create table grantt(grant_id int, grant_name varchar, grant_percent varchar, u_id int, primary key(grant_id), foreign key(u_id) references university(u_id));
create table city(city_id int, city_name varchar, primary key (city_id));
create table school(s_id int, s_name varchar, city_id int, primary key (s_id), foreign key (city_id) references city(city_id));
create table student(student_id int, student_name varchar, s_id int, city_id int, sdep_id int, gpa_id varchar, club_id int, grant_id int, primary key(student_id), foreign key(s_id) references school(s_id), foreign key (city_id) references city(city_id), foreign key (sdep_id) references student_department(sdep_id), foreign key (gpa_id) references gpa(gpa_id), foreign key (club_id) references club(club_id), foreign key (grant_id) references grantt(grant_id));
\\ Create table is the keyword telling the database system what you want to do. In this case, you want to create a new table.



Alter table. \\ The alter table statement is used to add, delete, or modify columns in an existing table. The alter table statement is also used to add and drop various constraints on an existing table.
alter table school drop constraint school_city_id_fkey;
alter table school drop column city_id;
alter table club add column city_id int;
alter table club add constraint fk_id foreign key (city_id) references city(city_id);
alter table club drop constraint fk_id;
alter table club drop column city_id;



DML statements. \\ Data manipulation language statements add, change, and delete Oracle Database table data. A transaction is a sequence of one or more SQL statements that Oracle Database treats as a unit: either all of the statements are performed, or none of them are.

INSERT INTO. \\ The insert into statement is used to add new data to a database.
insert into university.
(u_id,u_name,u_email,u_phone_number,u_address,u_city,u_website,u_code) values
(1,'Astana_IT','info@astanait.edu.kz','+7(7172)645-710','business-centre EXPO,block C.1','Nur-Sultan','astanait.edu.kz','522'),
(2, 'Philosophisch-Theologische Hochschule SVD Sankt Augustin', 'cdesborough0@liveinternet.ru', '118-878-7620', '15 Becker Junction', 'Lamas', 'bloglovin.com',559),
(3, 'Universidad Abierta y a Distancia de Panama', 'bfriel1@slideshare.net', '204-875-6705', '1 Springview Avenue', 'Mandangoa', 'icq.com',155),
(4, 'Centro Universitário de Araraquara', 'hdudman2@bizjournals.com', '235-947-0002', '724 Utah Trail', 'Sąspów', 'twitter.com',3212),
(5, 'Cyprus College', 'twoodwind3@sitemeter.com', '821-919-7786', '74 Elmside Place', 'Jisegumen', 'dedecms.com',245),
(6, 'Chatham College', 'cmountney4@msn.com', '771-175-3225', '14378 Stone Corner Parkway', 'Cheban', 'tinyurl.com',254),
(7, 'Sweet Briar College', 'mbeckley5@netscape.com', '395-299-5715', '83 Brickson Park Center', 'Anaco', 'opensource.org',102),
(8, 'Ecole Nationale Vétérinaire de Nantes', 'dhubach6@craigslist.org', '618-737-8365', '5830 Mayfield Trail', 'Longju', 'yolasite.com',246),
(9, 'Baltic State Technical University', 'ccasel7@shinystat.com', '818-247-9021', '75833 Barby Road', 'Dzel', 'mysql.com',2574),
(10, 'Instituto Tecnológico de Costa Rica', 'lgolt8@discuz.net', '791-790-9772', '9024 Mitchell Trail', 'Shalkar', 'accuweather.com',217);

insert into department(dep_id,dep_name,u_id) values ('1','teachers','1'),
('2','administration','1'),
('3','secuirity','1'),
('4','cleaning','1'),

('5','stud_affairs','1'),
('6','marketing','1'),
('7','international_cooperation','1'),
('8','employment','1'),
('9','finance','1'),
('10','psychologists','1'),
('11','science','1'),
('12','service','1'),
('13','military','1');

	dep_id [PK] integer	dep_name character varying	u_id integer
1	1	teachers	1
2	2	administration	1
3	3	secuirity	1
4	4	cleaning	1
5	5	stud_affairs	1
6	6	marketing	1
7	7	international_cooperati...	1
8	8	employment	1
9	9	finance	1
10	10	psychologists	1
11	11	science	1
12	12	service	1
13	13	military	1

insert into student_department (sdep_id,sdep_name,u_id) values ('1','BDA','1'),
('2','IT','1'),
('3','CS','1'),
('4','SE','1'),
('5','IA','1'),
('6','MT','1'),
('7','TS','1'),
('8','ITM','1'),
('9','DJ','1');

	sdep_id [PK] integer	sdep_name character varying	u_id integer
1	1	BDA	1
2	2	IT	1
3	3	CS	1
4	4	SE	1
5	5	IA	1
6	6	MT	1
7	7	TS	1
8	8	ITM	1
9	9	DJ	1

```
insert into disciplines(d_id,d_name) values
('1','English'),
('2','Information and Communication Technologies'),
('3','Mathematical Analysis '),
('4','Programming C++'),
('5','Discrete Mathematics'),
('6','Algorithms and Data Structures'),
('7','Web Development'),
('8','Algebra and Geometry'),
('9','Programming (Java)'),
('10','Web Technologies'),
('11','Modern History of Kazakhstan'),
('12','Physical Culture'),
('13','Philosophy '),
('14','Kazakh (Russian) Language '),
('15','Introduction to Data Analytics'),
('16','Database Management Systems'),
('17','Programming for Data Science with Python 1 '),
('18','PL/SQL 1 // Advanced Java 1 // Advanced C# 1 '),
('19','Business Process Engineering '),
('20','Information Retrieval and Data Mining '),
('21','Digital Systems '),
('22','Information Security Fundamentals '),
('23','Robotics & Mechtronics '),
('24','Signals and Systems '),
('25','Electronics '),
('26','Software Engineering for Embedded Systems'),
('27','Audio Electronics '),
('28','Computer Graphics'),
('29','UX / UI Design '),
('30','Crytopgraphy ');
```

	d_id [PK] integer	d_name character varying
1	1	English
2	2	Information and Comm...
3	3	Mathematical Analysis
4	4	Programming C++
5	5	Discrete Mathematics
6	6	Algorithms and Data St...
7	7	Web Development
8	8	Algebra and Geometry
9	9	Programming (Java)
10	10	Web Technologies
11	11	Modern History of Kaz...
12	12	Physical Culture
13	13	Philosophy
14	14	Kazakh (Russian) Lang...
15	15	Introduction to Data An...
16	16	Database Managemen...
17	17	Programming for Data ...
18	18	PL/SQL 1 // Advanced ...
19	19	Business Process Engi...
20	20	Information Retrieval a...

insert into teacher (t_id,t_name,dep_id,d_id) values ('1','Olzhas Aimukhambetov','1','4'),
('2','Mugzar Akizhanov','1','4'),
('3','Beibut Amirgaliyev','1','4'),
('4','Yekaterina Burkeyeva','1','4'),
('5','Adilbek Dostiyarov','1','4'),
('6','Rasul Kairgeldin','1','4'),
('7','Aidana Kalakova','1','4'),
('8','Danabek Kaliazhdarov','1','4'),
('9','Askar Khaimuldin','1','4'),
('10','Nursultan Khaimuldin','1','4'),
('11','Dauren Malayev','1','4'),
('12','Azamat Ordabekov','1','4'),
('13','Didar Yedilkhan','1','4'),
('14','Aigerim Yessenbayeva','1','4'),
('15','Abulkhair Zhamiyev','1','4'),
('16','Gulnara Abitova','1','2'),
('17','Elvira Aitmukhanbetova','1','2'),
('18','Yerasyl Amanbek','1','2'),
('19',' Aiym Apayeva','1','2'),
('20','Ulan Auyelbekov','1','2'),
('21',' Samat Kassymkhanov','1','2'),
('22','Karlyga Kutybayeva','1','2'),
('23','Ruslan Omirgaliyev','1','2'),

('24','Sholpan Saimassayeva','1','2'),
('25',' Aivar Sakhipov','1','2'),
('26',' Satbaev Syndar','1','3'),
('27',' Qadyr Baqdaulet','1','25'),
('28',' Orazgalieva Laura','1','14'),
('29',' Ishmuhambetov Nariman ','1','1'),
('30',' Aitbaev Dimash ','1','19'),
('31',' Kattabekova Saule ','1','3'),
('32',' Kurmangaliev Alibek','1','1'),
('33',' Borashova Sholpan ','1','27'),
('34',' Sartaev Bauyrzhan ','1','4'),
('35',' Kattabekova Saule ','1','5'),
('36',' Kamieva Gulmira ','1','6'),
('37',' Raikhan Madi ','1','7'),
('38',' Uyzbaeva Anar','1','8'),
('39',' Shajahmetov Nurbek ','1','9'),
('40',' Serikbolsyn Tastanbek ','1','21'),
('41',' Askar Jemalov ','1','30'),
('42',' Guldana Zhumagaliyeva ','1','22'),
('43',' Moldir Toleubek ','1','15'),
('44',' Yerzhan Baissalov ','1','16'),
('45',' Zhazira Bekzhanova ','1','13'),
('46',' Meruyert Zhenisbayeva ','1','7'),
('47',' Nazerke Medeshova ','1','9'),
('48',' Alpamys Dosbol ','1','17'),
('49',' Dina Kassabek ','1','7'),
('50',' Aidana Tolebekova ','1','26');

	t_id [PK] integer	t_name character varying	dep_id integer	d_id integer
1	1	Olzhas Aimukhambetov	1	4
2	2	Mugzar Akizhanov	1	4
3	3	Beibut Amirgaliyev	1	4
4	4	Yekaterina Burkeyeva	1	4
5	5	Adilbek Dostiyarov	1	4
6	6	Rasul Kairgeldin	1	4
7	7	Aidana Kalakova	1	4
8	8	Danabek Kaliazhdarov	1	4
9	9	Askar Khaimuldin	1	4
10	10	Nursultan Khaimuldin	1	4
11	11	Dauren Malayev	1	4
12	12	Azamat Ordabekov	1	4
13	13	Didar Yedilkhan	1	4
14	14	Aigerim Yessenbayeva	1	4
15	15	Abulkhair Zhamiyev	1	4
16	16	Gulnara Abitova	1	2
17	17	Elvira Aitmukhanbetova	1	2
18	18	Yerasyl Amanbek	1	2
19	19	Aiym Apayeva	1	2
20	20	Ulan Auyelbekov	1	2

insert into club(club_id,club_name) values
('1','Music club'),
('2','Cybersport club'),
('3','Basketball club '),
('4','Demeu club'),
('5','Chess club '),
('6','Event club'),
('7','AITUKIT'),
('8','Charity club'),
('9','Intellectuals club '),
('10','AITU JOKERS'),
('11','New Wave '),
('12','Hydra organization '),
('13','Dance club '),
('14','Football club '),
('15','Startup club '),
('16','AITU Volleyball club '),
('17','Oratory club '),
('18','Volunteer club '),
('19','AITU PHOENIX '),
('20','Media club '),
('21','Debate club '),
('22','Galleryone '),
('23','Android Development '),
('24','Reading club '),
('25','Math club ');

Data Output Explain Messages Notifications

	club_id [PK] integer	club_name character varying
1	1	Music club
2	2	Cybersport club
3	3	Basketball club
4	4	Demeu club
5	5	Chess club
6	6	Event club
7	7	AITUKIT
8	8	Charity club
9	9	Intellectuals club
10	10	AITU JOKERS
11	11	New Wave
12	12	Hydra organization
13	13	Dance club
14	14	Football club
15	15	Startup club
16	16	AITU Volleyball club
17	17	Oratory club
18	18	Volunteer club
19	19	AITU PHOENIX
20	20	Media club

insert into gpa(gpa_id, gpa_percentage, gpa_description, gpa_points) values
('A', '95-100', 'excellent', '4'), ('A-', '90-94', 'excellent', '3.67'),
('B+', '85-90', 'good', '3.33'), ('B', '80-84', 'good', '3'),
('B-', '75-79', 'good', '2.67'), ('C+', '70-74', 'satisfactory', '2.33'),
('C', '65-69', 'satisfactory', '2'), ('C-', '60-64', 'satisfactory', '1.67'),

('D+', '55-59', 'satisfactory', '1.33'), ('D', '50-54', 'satisfactory', '1'),
('FX', '25-49', 'failure', '0.5'), ('F', '0-24', 'failure', '0'),
('0','0','retake','0');

	gpa_id [PK] character varying	gpa_percentage character varying	gpa_description character varying
1	0	0	retake
2	A	95-100	excellent
3	A-	90-94	excellent
4	B	80-84	good
5	B-	75-79	good
6	B+	85-90	good
7	C	65-69	satisfactory
8	C-	60-64	satisfactory
9	C+	70-74	satisfactory
10	D	50-54	satisfactory
11	D+	55-59	satisfactory
12	F	0-24	failure
13	FX	25-49	failure

insert into city (city_id,city_name) values
('1','Almaty'),
('2','Nur-Sultan'),
('3','Shymkent'),
('4','Aktobe'),
('5','Karagandy'),
('6','Taraz'),
('7','Pavlodar'),
('8','Oskemen'),
('9','Semey'),
('10','Atyrau'),
('11','Kostanay'),
('12','Kyzylorda'),
('13',' Oral'),
('14','Petropavl'),
('15',' Aktau'),
('16','Temirtau'),
('17',' Turkistan'),
('18',' Kokshetau'),
('19','Taldykorgan'),
('20','Ekibastuz'),
('21','Kentau');

	city_id [PK] integer	city_name character varying
1	1	Almaty
2	2	Nur-Sultan
3	3	Shymkent
4	4	Aktobe
5	5	Karagandy
6	6	Taraz
7	7	Pavlodar
8	8	Oskemen
9	9	Semey
10	10	Atyrau
11	11	Kostanay
12	12	Kyzylorda
13	13	Oral
14	14	Petropavl
15	15	Aktau
16	16	Temirtau
17	17	Turkistan
18	18	Kokshetau
19	19	Taldykorgan
20	20	Ekibastuz

Insert into grantt (grant_id, grant_name, grant_percent, u_id) values
('1', 'state grant', '100', '1'),
('2', 'rectors grant', '100', '1'),
('3' ,'70-89', '40', '1'),
('4', '90-109', '50', '1'),
('5', '110-140', '70', '1'),
('6', 'olympiad_1', '90', '1'),
('7', 'olympiad_2', '70', '1'),
('8', 'olympiad_3', '50', '1'),
('9', 'fund_1', '100', '1'),
('10', 'fund_2', '50', '1');

	grant_id [PK] integer	grant_name character varying	grant_percent character varying	u_id integer
1	1	state grant	100	1
2	2	rectors grant	100	1
3	3	70-89	40	1
4	4	90-109	50	1
5	5	110-140	70	1
6	6	olympiad_1	90	1
7	7	olympiad_2	70	1
8	8	olympiad_3	50	1
9	9	fund_1	100	1
10	10	fund_2	50	1

insert into school (s_id,s_name) values
('1','NIS'),
('2','KTL'),
('3','RFMS'),
('4','DARYN'),
('5','haileybury'),
('6','lyceum'),
('7','gymnasium'),
('8','sportschool'),
('9','internat'),
('10','college'),
('11','overseas school'),
('12','school');

	s_id [PK] integer	s_name character varying
1	1	NIS
2	2	KTL
3	3	RFMS
4	4	DARYN
5	5	haileybury
6	6	lyceum
7	7	gymnasium
8	8	sportschool
9	9	internat
10	10	college
11	11	overseas school
12	12	school

insert into student (student_id, student_name, s_id, city_id, sdep_id, gpa_id, club_id, grant_id) values
(1, 'Nada Cocksedge', 12, 20, 6, 'A', 22, 5),
(2, 'Isis Skilton', 6, 10, 5, 'A', 18, 3);
(3, 'Vincent Cassels', 11, 11, 7, 'A', 2, 9);
(4, 'Alistair Markos', 7, 18, 9, 'A', 13, 5);
(5, 'Emmott MacKniely', 7, 21, 3, 'A', 15, 6);
(6, 'Willette Elington', 1, 16, 5, 'B+', 20, 1);
(7, 'Martino Nasey', 9, 12, 8, 'B+', 1, 6);
(8, 'Sax Haste', 1, 1, 9, 'B+', 9, 1);
(9, 'Neil Sixsmith', 11, 4, 8, 'B+', 8, 9);
(10, 'Izaak Grzes', 8, 3, 9, 'B+', 23, 9);
(11, 'Gunther Dawley', 10, 15, 3, 'B', 21, 10);
(12, 'Goran Mitchley', 7, 6, 4, 'B', 2, 5);
(13, 'Gretel McCrorie', 4, 13, 2, 'B', 20, 1);
(14, 'Neall MacDearmid', 10, 4, 5, 'B', 21, 1);
(15, 'Ofelia Bayless', 3, 3, 8, 'B', 1, 10);
(16, 'Hanson Doby', 3, 9, 1, 'B-', 21, 6);
(17, 'Agnese Jansa', 2, 21, 5, 'B-', 3, 5);
(18, 'Sisile Haydock', 10, 10, 9, 'B-', 20, 8);

(19, 'Sally Cothey', 2, 7, 6, 'C+', 22, 4);
(20, 'Pacorro Kermannes', 3, 10, 8, 'C+', 21, 5);
(21, 'Rahal Ivankov', 11, 15, 8, 'C+', 14, 4);
(22, 'Eberhard Valdes', 6, 16, 7, 'C', 16, 3);
(23, 'Wilt Rooper', 10, 1, 7, 'C', 10, 3);
(24, 'Fin Hulke', 12, 2, 8, 'C', 17, 2);
(25, 'Toddy Mazillius', 4, 12, 9, 'C-', 18, 9);
(26, 'Rakel Wilkison', 3, 15, 6, 'C-', 4, 10);
(27, 'Cris Clayworth', 3, 9, 6, 'C-', 23, 5);
(28, 'Virgilio Bertl', 6, 21, 4, 'D', 23, 7);
(29, 'Orrin Craddy', 9, 4, 7, 'D', 21, 2);
(30, 'Karlik Ayling', 5, 17, 2, 'D', 15, 9);
(31, 'Zea Hehir', 7, 9, 1, 'D+', 4, 10);
(32, 'Moore Kildea', 5, 20, 1, 'D+', 17, 5);
(33, 'Jessalin Iwanowicz', 6, 1, 1, 'D+', 10, 1);
(34, 'Lorri Soigoux', 10, 1, 2, 'FX', 23, 9);
(35, 'Annabal Gillitt', 10, 11, 8, 'FX', 22, 6);
(36, 'Ernestus Stickels', 11, 17, 8, 'FX', 16, 8);
(37, 'Shirleen Bolzmann', 7, 10, 3, 'F', 20, 1);
(38, 'Sully Alvy', 6, 2, 9, 'F', 22, 2);
(39, 'Pearl McClounan', 8, 10, 2, 'F', 20, 9);

	student_id [PK] integer	student_name character varying	s_id integer	city_id integer	sdep_id integer	gpa_id character varying	club_id integer	grant_id integer
1	1	Nada Cocksedge	12	20	6	A	22	5
2	2	Isis Skilton	6	10	5	A	18	3
3	3	Vincent Cassels	11	11	7	A	2	9
4	4	Alistair Markos	7	18	9	A	13	5
5	5	Emmott MacKniely	7	21	3	A	15	6
6	6	Willette Elington	1	16	5	B+	20	1
7	7	Martino Nasey	9	12	8	B+	1	6
8	8	Sax Haste	1	1	9	B+	9	1
9	9	Neil Sixsmith	11	4	8	B+	8	9
10	10	Izaak Grzes	8	3	9	B+	23	9
11	11	Gunther Dawley	10	15	3	B	21	10
12	12	Goran Mitchley	7	6	4	B	2	5
13	13	Gretel McCrorie	4	13	2	B	20	1
14	14	Neall MacDearmid	10	4	5	B	21	1
15	15	Ofelia Bayless	3	3	8	B	1	10
16	16	Hanson Doby	3	9	1	B-	21	6
17	17	Agnese Jansa	2	21	5	B-	3	5
18	18	Sisile Haydock	10	10	9	B-	20	8
19	19	Sally Cothey	2	7	6	C+	22	4
20	20	Pacorro Kermannes	3	10	8	C+	21	5

UPDATE. \\The update statement is used to modify the existing records in a table.
City:
update city set city_name = 'Foreign' where city_id=20
Club:
update club set club_name = 'Geek club' where club_id=10;

	club_id [PK] integer	club_name character varying
1	2	Cybersport club
2	3	Basketball club
3	4	Demeu club
4	5	Chess club
5	6	Event club
6	7	AITUKIT
7	8	Charity club
8	9	Intellectuals cl...
9	10	Geek club
10	11	New Wave
11	12	Hydra organiza...
12	13	Dance club

Department:

update department set dep_name = 'student' where dep_id=5;

	dep_id [PK] integer	dep_name character v	u_id integer
1	1	teachers	1
2	2	administ...	1
3	3	secuirity	1
4	4	cleaning	1
5	5	student	1
6	6	marketing	1
7	7	internati...	1
8	8	employ...	1
9	9	finance	1
10	10	psychol...	1
11	11	science	1
12	12	service	1
13	13	military	1

Disciplines:

update disciplines set d_name = 'ICT' where d_id=2;

	d_id [PK] integer	d_name character varying
1	1	English
2	2	ICT
3	3	Mathematical Analysis
4	4	Programming C++
5	5	Discrete Mathematics
6	6	Algorithms and Data St...
7	7	Web Development
8	8	Algebra and Geometry
9	9	Programming (Java)

Gpa:

update gpa set gpa_points = '4.0' where gpa_id='A';
update gpa set gpa_points = '3.0' where gpa_id='B';
update gpa set gpa_points = '2.0' where gpa_id='C';
update gpa set gpa_points = '1.0' where gpa_id='D';

1	0	0	retake	0
2	A	95-100	excellent	4.0
3	A-	90-94	excellent	3.67
4	B	80-84	good	3.0
5	B-	75-79	good	2.67
6	B+	85-90	good	3.33
7	C	65-69	satisfactory	2.0
8	C-	60-64	satisfactory	1.67
9	C+	70-74	satisfactory	2.33
10	D	50-54	satisfactory	1.0
11	D+	55-59	satisfactory	1.33
12	F	0-24	failure	0
13	FX	25-49	failure	0.5

Grantt:

update grantt set grant_percent = '80' where grant_id='9';

	grant_id [PK] integer	grant_name character vary	grant_percent character varying	u_id integer
1	1	state grant	100	1
2	2	rectors grant	100	1
3	3	70-89	40	1
4	4	90-109	50	1
5	5	110-140	70	1
6	6	olympiad_1	90	1
7	7	olympiad_2	70	1
8	8	olympiad_3	50	1
9	9	fund_1	80	1
10	10	fund_2	50	1

School:

update school set s_name = 'Daryn' where s_id=4;

	s_id [PK] integer	s_name character varying
1	1	NIS
2	2	KTL
3	3	RFMS
4	4	Daryn
5	5	haileybury
6	6	lyceum
7	7	gymnasium
8	8	sportschool
9	9	internat
10	10	college
11	11	overseas school
12	12	school

Student:

update student set club_id=21 where student_id=3;

Data Output | Explain | Messages | Notifications

	student_id [PK] integer	student_name character varying	s_id integer	city_id integer	sdep_id integer	gpa_id character varying	club_id integer	grant_id integer
1	1	Nada Cocksedge	12	20	6	A	22	5
2	2	Isis Skilton	6	10	5	A	18	3
3	3	Vincent Cassels	11	11	7	A	21	9
4	4	Alistair Markos	7	18	9	A	13	5
5	5	Emmott MacKniely	7	21	3	A	15	6
6	6	Willette Elington	1	16	5	B+	20	1
7	7	Martino Nasey	9	12	8	B+	1	6
8	8	Sax Haste	1	1	9	B+	9	1
9	9	Neil Sixsmith	11	4	8	B+	8	9
10	10	Izaak Grzes	8	3	9	B+	23	9
11	11	Gunther Dawley	10	15	3	B	21	10
12	12	Goran Mitchley	7	6	4	B	2	5
13	13	Gretel McCrorie	4	13	2	B	6	1
14	14	Neall MacDearmid	10	4	5	B	21	1
15	15	Ofelia Bayless	3	3	8	B	1	10
16	16	Hanson Doby	3	9	1	B-	21	6
17	17	Agnese Jansa	2	21	5	B-	3	5
18	18	Sisile Haydock	10	10	9	B-	20	8
19	19	Sally Cothey	2	7	6	C+	22	4

update student set club_id=12 where student_id=32;
update student set club_id=4 where student_id=23;
update student set club_id=6 where student_id=13;
update student set club_id=15 where student_id=30;

Student_department:

update student_department set sdep_name='BD' where sdep_id=1;

	sdep_id [PK] integer	sdep_name character varying	u_id integer
1	1	BD	1
2	2	IT	1
3	3	CS	1
4	4	SE	1
5	5	IA	1
6	6	MT	1
7	7	TS	1
8	8	ITM	1
9	9	DJ	1

Teacher:

update teacher set t_name='Qyzylbek Hamashev' where t_id=47;

41	41	Askar Jemalov	1	30
42	42	Guldana Zhumagaliye...	1	22
43	43	Moldir Toleubek	1	15
44	44	Yerzhan Baissalov	1	16
45	45	Zhazira Bekzhanova	1	13
46	46	Meruyert Zhenisbayeva	1	7
47	47	Qyzylbek Hamashev	1	9
48	48	Alpamys Dosbol	1	17
49	49	Dina Kassabek	1	7
50	50	Aidana Tolebekova	1	26

University:

update university set u_phone_number='64-57-10' where u_id=1;

	u_id [PK] integer	u_name character varying	u_email character varying	u_phone_number character varying	u_address character varying	u_city character varying	u_website character varying
1	1	Astana_IT	info@astanait.edu.kz	64-57-10	business-centre EXPO,...	Nur-Sultan	astanait.edu.kz
2	2	Philosophisch-Theolog...	cdesborough0@liveint...	118-878-7620	15 Becker Junction	Lamas	bloglovin.com
3	3	Universidad Abierta y a...	bfriel1@slideshare.net	204-875-6705	1 Springview Avenue	Mandangoa	icq.com
4	4	Centro Universitário de...	hdudman2@bizjournal...	235-947-0002	724 Utah Trail	Sąspów	twitter.com
5	5	Cyprus College	twoodwind3@sitemete...	821-919-7786	74 Elmside Place	Jisegumen	dedecms.com
6	6	Chatham College	cmountney4@msn.com	771-175-3225	14378 Stone Corner Pa...	Cheban	tinyurl.com
7	7	Sweet Briar College	mbeckley5@netscape....	395-299-5715	83 Brickson Park Center	Anaco	opensource.org
8	8	Ecole Nationale Vétérin...	dhubach6@craigslist.o...	618-737-8365	5830 Mayfield Trail	Longju	yolasite.com
9	9	Baltic State Technical ...	ccasel7@shinystat.com	818-247-9021	75833 Barby Road	Dzel	mysql.com
10	10	Instituto Tecnológico d...	lgolt8@discuz.net	791-790-9772	9024 Mitchell Trail	Shalkar	accuweather.com

DELETE. \\ The delete statement is used to delete existing records in a table.

Student:

delete from student where city_id='20';
delete from student where s_id=8;
delete from student where sdep_id=5;
delete from student where grant_id>8;
delete from student where club_id<2;

	student_id [PK] integer	student_na character	s_id integer	city_id integer	sdep_id integer	gpa_id character	club_id integer	grant_id integer
1	4	Alistair ...	7	18	9	A	13	5
2	5	Emmott...	7	21	3	A	15	6
3	8	Sax Has...	1	1	9	B+	9	1
4	12	Goran ...	7	6	4	B	2	5
5	13	Gretel ...	4	13	2	B	6	1
6	16	Hanson...	3	9	1	B-	21	6
7	18	Sisile H...	10	10	9	B-	20	8
8	19	Sally Co...	2	7	6	C+	22	4
9	20	Pacorro...	3	10	8	C+	21	5
10	21	Rahal Iv...	11	15	8	C+	14	4
11	22	Eberhar...	6	16	7	C	16	3
12	23	Wilt Ro...	10	1	7	C	4	3
13	24	Fin Hulke	12	2	8	C	17	2
14	27	Cris Cla...	3	9	6	C-	23	5

City:

delete from city where city_id='20';

14	14	Petropavl
15	15	Aktau
16	16	Temirtau
17	17	Turkistan
18	18	Kokshetau
19	19	Taldykorgan
20	21	Kentau

Club:

delete from club where club_id<2;

	club_id [PK] integer	club_name character varying
1	2	Cybersport club
2	3	Basketball club
3	4	Demeu club
4	5	Chess club
5	6	Event club
6	7	AITUKIT

Department:

delete from department where dep_id>7;

	dep_id [PK] int	dep_name character varyi	u_id integer
1	1	teachers	1
2	2	administration	1
3	3	secuirity	1
4	4	cleaning	1
5	5	student	1
6	6	marketing	1
7	7	international...	1

Teacher:

delete from teacher where d_id=7;

	t_id [PK] i	t_name character varying	dep_id integer	d_id integer
35	35	Kattabekova Saule	1	5
36	36	Kamieva Gulmira	1	6
37	38	Uyzbaeva Anar	1	8
38	39	Shajahmetov Nurbek	1	9
39	40	Serikbolsyn Tastan...	1	21
40	41	Askar Jemalov	1	30
41	42	Guldana Zhumagali...	1	22
42	43	Moldir Toleubek	1	15
43	44	Yerzhan Baissalov	1	16
44	45	Zhazira Bekzhanova	1	13
45	47	Qyzylbek Hamashev	1	9
46	48	Alpamys Dosbol	1	17
47	50	Aidana Tolebekova	1	26

Disciplines:

delete from disciplines where d_id=7;

	d_id [PK] integer	d_name character varying
1	1	English
2	2	ICT
3	3	Mathematical Analysis
4	4	Programming C++
5	5	Discrete Mathematics
6	6	Algorithms and Data St...
7	8	Algebra and Geometry
8	9	Programming (Java)

Gpa:

delete from gpa where gpa_id='0';

	gpa_id [PK] charact	gpa_percen character v	gpa_description character varying	gpa_points character varying
1	A	95-100	excellent	4.0
2	A-	90-94	excellent	3.67
3	B	80-84	good	3.0
4	B-	75-79	good	2.67
5	B+	85-90	good	3.33
6	C	65-69	satisfactory	2.0
7	C-	60-64	satisfactory	1.67
8	C+	70-74	satisfactory	2.33
9	D	50-54	satisfactory	1.0
10	D+	55-59	satisfactory	1.33
11	F	0-24	failure	0
12	FX	25-49	failure	0.5

Grantt:

delete from grantt where grant_id>8;

School:

delete from school where s_id=8;

	s_id [PK] i	s_name character varying
1	1	NIS
2	2	KTL
3	3	RFMS
4	4	Daryn
5	5	haileybury
6	6	lyceum
7	7	gymnasium
8	9	internat
9	10	college
10	11	overseas school
11	12	school

Student_department:

delete from student_department where sdep_name='IA';

	sdep. [PK] i	sdep_nam character	u_id integer
1	1	BD	1
2	2	IT	1
3	3	CS	1
4	4	SE	1
5	6	MT	1
6	7	TS	1
7	8	ITM	1
8	9	DJ	1

University:

delete from university where u_id>1;

	u_id [PK] integer	u_name character varying	u_email character varying	u_phone_number character varying	u_address character varying	u_city character varying
1	1	Astana_IT	info@astanait.edu.kz	64-57-10	business-centre EXPO,...	Nur-Sultan

Queries. \\ A query is a question or inquiry about a set of data.

INNER JOIN. \\ An inner join is such type of join that returns all rows from both the participating tables where the key record of one table is equal to the key records of another table.

```
select student_id,student_name,student_department.sdep_name
from student_department
inner join student on student_department.sdep_id=student.sdep_id;
```

	student_id integer	student_name character varying	sdep_name character varying
1	4	Alistair Markos	DJ
2	5	Emmott MacKniely	CS
3	8	Sax Haste	DJ
4	12	Goran Mitchley	SE
5	16	Hanson Doby	BD
6	18	Sisile Haydock	DJ
7	19	Sally Cothey	MT
8	20	Pacorro Kermannes	ITM
9	21	Rahal Ivankov	ITM
10	22	Eberhard Valdes	TS
11	24	Fin Hulke	ITM
12	27	Cris Clayworth	MT
13	28	Virgilio Bertl	SE
14	29	Orrin Craddy	TS

LEFT JOIN. \\ The left join keyword returns all records from the left table (table1), and the matched records from the right table (table2). The result is null from the right side, if there is no match.

```
select t_id,t_name,disciplines.d_name
from disciplines
left join teacher on disciplines.d_id=teacher.d_id;
```

	t_id integer	t_name character varying	d_name character varying
1	1	Olzhas Aimukhambetov	Programming C++
2	2	Mugzar Akizhanov	Programming C++
3	3	Beibut Amirgaliyev	Programming C++
4	4	Yekaterina Burkeyeva	Programming C++
5	5	Adilbek Dostiyarov	Programming C++
6	6	Rasul Kairgeldin	Programming C++
7	7	Aidana Kalakova	Programming C++
8	8	Danabek Kaliazhdarov	Programming C++
9	9	Askar Khaimuldin	Programming C++

RIGHT JOIN. \\ The right join keyword returns all records from the right table (table2), and the matched records from the left table (table1). The result is null from the left side, when there is no match.

```
select student_id,student_name,school.s_name
from school
right join student on school.s_id=student.s_id;
```

	student_id integer	student_name character varying	s_name character varying
1	8	Sax Haste	NIS
2	19	Sally Cothey	KTL
3	27	Cris Clayworth	RFMS
4	20	Pacorro Kermannes	RFMS
5	16	Hanson Doby	RFMS
6	38	Sully Alvy	lyceum
7	33	Jessalin Iwanowicz	lyceum
8	28	Virgilio Bertl	lyceum
9	22	Eberhard Valdes	lyceum

FULL JOIN. \\ The full join combines the results of both left and right outer joins. The joined table will contain all records from both the tables and fill in null for missing matches on either side.

```
select student_id,student_name,gpa.gpa_id
from gpa
full join student on gpa.gpa_id = student.gpa_id
where gpa.gpa_percentage > '95';
```

	student_id integer	student_name character varying	gpa_id character varying
1	5	Emmott MacKniely	A
2	4	Alistair Markos	A

COUNT. \\ The count () function returns the number of rows that matches a specified criterion.

```
select count(*) from student where sdep_id = '1';
```

	count bigint
1	2

BETWEEN.AND. \\ The between operator selects values within a given range.

```
select student_id,student_name,club_id from student where club_id between 5 and 15;
```

	student_id [PK] integer	student_name character varying	club_id integer
1	4	Alistair Markos	13
2	5	Emmott MacKniely	15
3	8	Sax Haste	9
4	21	Rahal Ivankov	14
5	33	Jessalin Iwanowicz	10
6	13	Gretel McCrorie	6

IN. \\ The in operator allows you to specify multiple values in a where clause.

```
select student_id,student_name from student
where student_name in ('Fin Hulke','Annabal Gillitt');
```

	student_id [PK] integer	student_name character varying
1	24	Fin Hulke
2	35	Annabal Gillitt

LIKE. \\ The like operator is used in a where clause to search for a specified pattern in a column.

```
select t_id,t_name from teacher
where t_name like ('A%');
```

	t_id [PK] integer	t_name character varying
1	5	Adilbek Dostiyarov
2	7	Aidana Kalakova
3	9	Askar Khaimuldin
4	12	Azamat Ordabekov
5	14	Aigerim Yessenbayeva
6	15	Abulkhair Zhamiyev

LENGTH.LIKE. \\ The length function returns the number of characters in a string.

```
select t_id,t_name from teacher
where t_name like ('A%') and length (t_name)<20;
```

	t_id [PK] integer	t_name character varying
1	5	Adilbek Dostiyarov
2	7	Aidana Kalakova
3	9	Askar Khaimuldin
4	12	Azamat Ordabekov
5	15	Abulkhair Zhamiyev

MAX. \\ Aggregate function that returns the maximum value in a set.

```
select max(gpa_percentage) from gpa;
```

	max text
1	95-100

MIN. \\ Returns the smallest value of the selected column.

select min(gpa_percentage) from gpa;

	min text
1	0-24

OR. \\ operator are used to filter records based on more than one condition.

```
select grant_id, grant_name
from grantt
where (grant_name = 'olympiad_1' OR grant_name = 'olympiad_2');
```

	grant_id [PK] integer	grant_name character varying
1	6	olympiad_1
2	7	olympiad_2

Subqueries: \\ A subquery is a SQL query within a query. They are nested queries that provide data to the enclosing query. Subqueries can return individual values or a list of records.

```
select student_id,student_name,city_id
from student where city_id=(
select city_id from student where student_name ='Alistair Markos' );
```

	student_id [PK] integer	student_name character varying	city_id integer
1	4	Alistair Markos	18

```
select*from student where city_id=(
select city_id from city
where city_id<2);
```

	student_id [PK] integer	student_name character varying	s_id integer	city_id integer	sdep_id integer	gpa_id character varying	club_id integer	grant_id integer
1	8	Sax Haste	1	1	9	B+	9	
2	33	Jessalin Iwanowicz	6	1	1	D+	10	
3	23	Wilt Rooper	10	1	7	C	4	

```
select student_id, student.student_name, university.u_name, university.u_code
from student_department
join student
on student.sdep_id=student_department.sdep_id
join university
on university.u_id=student_department.u_id;
```

	student_id integer	student_name character varying	u_name character varying	u_code integer
1	4	Alistair Markos	Astana_IT	522
2	5	Emmott MacKniely	Astana_IT	522
3	8	Sax Haste	Astana_IT	522
4	12	Goran Mitchley	Astana_IT	522
5	16	Hanson Doby	Astana_IT	522
6	18	Sisile Haydock	Astana_IT	522
7	19	Sally Cothey	Astana_IT	522
8	20	Pacorro Kermannes	Astana_IT	522
9	21	Rahal Ivankov	Astana_IT	522
10	22	Eberhard Valdes	Astana_IT	522
11	24	Fin Hulke	Astana_IT	522
12	27	Cris Clayworth	Astana_IT	522

```
select teacher.t_id, teacher.t_name, university.u_name, university.u_code
from department
join teacher
on department.dep_id=teacher.dep_id
join university
on university.u_id=department.u_id;
```

	t_id integer	t_name character varying	u_name character varying	u_code integer
1	1	Olzhas Aimukhambetov	Astana_IT	522
2	2	Mugzar Akizhanov	Astana_IT	522
3	3	Beibut Amirgaliyev	Astana_IT	522
4	4	Yekaterina Burkeyeva	Astana_IT	522
5	5	Adilbek Dostiyarov	Astana_IT	522
6	6	Rasul Kairgeldin	Astana_IT	522
7	7	Aidana Kalakova	Astana_IT	522
8	8	Danabek Kaliazhdarov	Astana_IT	522
9	9	Askar Khaimuldin	Astana_IT	522
10	10	Nursultan Khaimuldin	Astana_IT	522

```
select s_id
from (select s_id
from school where s_id<4)AS derivedTable ;
```

	s_id [PK] integer
1	1
2	2
3	3

Reflection

Purpose	o Understand the fundamental roles of DBMS that play in the organization; o Understand and utilize the SQL queries in depth; o Design the database tables properly, so that our design and implementation demonstrate logical integrity and coherence; o Explain the relational database concepts; o Understand and acquire the SQL DDL and DML statements; o Design and implement SQL database;
Define the purpose of system	We decided on the goals and definitions of the database in the process of active discussion. To determine the optimal answer to the questions, I expressed my opinion, arguing with the knowledge gained for the trimester and the facts in the lectures, and thus, in the process of discussion, we came to a common solution.
Create ERD	We also created the EPD together with the help of the site Lucid which allowed us to simultaneously correct the data. I was creating tables in a chart while my partner was defining data types. The relationship between the tables was made in the process of discussion.
Create database	I skipped the process of creating tables for the database, since the task was easy for my partner to do it on his own while I was preparing the presentation.
Alter table	The task was simple. We did it together with a partner. I dictated my ideas to him or sent my options in the chat. Thus, we divided the execution of the task in two.
DML statements	In this task, due to the larger number of tasks, we divided it. And everyone did their part, after which they combined the results.
Queries	In this task, due to the larger number of tasks, we divided it. And everyone did their part, after which they combined the results.
Subqueries	In this task, due to the larger number of tasks, we divided it. And everyone did their part, after which they combined the results.
Presenting your work	I took over the presentation, as the partner was engaged in the creation of tables.
Documenting your work	We did the documentation together. Fortunately, Microsoft allows a team to work on one file. If he added data, then I was engaged in correcting them.
Conclusion	o Creating a database from your own experience; o Working with a large volume of material; o Repetition of learned material; o Work with pgadmin; o Understand the fundamental roles of DBMS that play in the organization; o Understand and utilize the SQL queries in depth;

	○ Design the database tables properly, so that our design and implementation demonstrate logical integrity and coherence; ○ Explain the relational database concepts; ○ Understand and acquire the SQL DDL and DML statements; ○ Design and implement SQL database;