

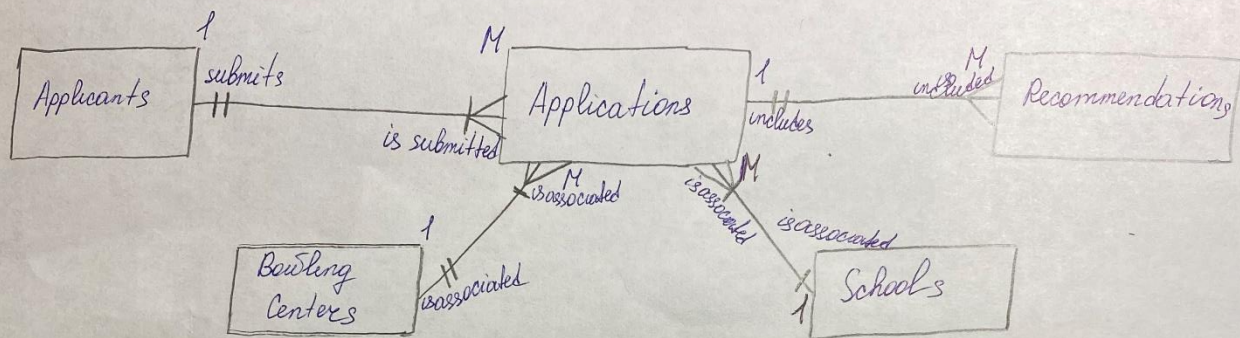
**JSC “Kazakh British Technical University”
School of Mathematic and Cybernetics**

Analysis of Data Bases

Laboratory Work #4

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Applications: Application_id, Application_date, Application_student_id, Bowling-center_id, appl-school_id, gpa-point

Applicants: Student_id, student-first_name, student-last_name, phone-number, email, address, age

Schools: school_id, school-address, school-name, school-phone number,

Bowling-centers: Bow_center_id, bow_center_name, bow_center_address, bow_center_phone, grade

Recommendations: recommendation_id, recommendation_application_id, recommendation_date

As for the Applications table:

```

create table applications(
    application_id integer constraint pk_application PRIMARY KEY,
    application_date date NOT NULL,
    application_student_id integer NOT NULL,
    application_bowling_center_id integer NOT NULL,
    application_school_id integer NOT NULL,
    application_gpa_point real,
    constraint min_point CHECK(application_gpa_point >= 3.5),
    constraint fk_app_student FOREIGN KEY(application_student_id) REFERENCES applicants(student_id),
    constraint fk_app_school FOREIGN KEY(application_school_id) REFERENCES schools(school_id),
    constraint fk_app_bow_center FOREIGN KEY (application_bowling_center_id) REFERENCES bowling_centers(bow_center_id)
);

insert into applications values (1,'2021-01-31',1,23,13,3.83);
insert into applications values (14,'2021-02-23',3,32,15,3.5);
insert into applications values (9,'2021-01-15',2,32,30,4.0);
insert into applications values (15,'2021-01-11',5,55,26,3.9);
insert into applications values (2,'2021-01-25',4,45,26,3.6);
drop table applications;
    
```

	application_id	application_date	application_student_id	application_bowling_center_id	application_school_id	application_gpa_point
1	1	2021-01-31	1	23	13	3.83
2	14	2021-02-23	3	32	15	3.5
3	9	2021-01-15	2	32	30	4
4	15	2021-01-11	5	55	26	3.9
5	2	2021-01-25	4	45	26	3.6

As for the Applicants table:

```
create table applicants(
    student_id serial constraint pk_applicant PRIMARY KEY,
    student_first_name varchar(20) NOT NULL,
    student_last_name varchar(20) NOT NULL,
    student_phone_number varchar(20),
    student_email varchar(20) unique,
    student_address varchar(30) NOT NULL,
    student_age integer,
    constraint min_age CHECK(student_age >=18)
);

insert into applicants values (default, 'Temirbolat', 'Maratuly', '123.456.789', 't_maratuly@kbtu.kz', 'Erzhanova 28', '20');
insert into applicants values (default, 'Assanali', 'Moldash', '228.009.123', 'a_moldash@kbtu.kz', 'Mailina 19', '19');
insert into applicants values (default, 'Temirlan', 'Serikov', '987.423.1532', 't_serikov@kbtu.kz', 'Tole Bi 59', '21');
insert into applicants values (default, 'Anuar', 'Sarsengaliyev', '234.526.749', 'sars_covid@gmail.com', 'Turgut Ozała 27', '20');
insert into applicants values (default, 'Tamerlan', 'Kunkash', '213.423.1234', 't_kvankash@kbtu.kz', 'Ermekova 39', '21');
drop table applicants;
```

	student_id	student_first_name	student_last_name	student_phone_number	student_email	student_address	student_age
1	1	Temirbolat	Maratuly	123.456.789	t_maratuly@kbtu.kz	Erzhanova 28	20
2	2	Assanali	Moldash	228.009.123	a_moldash@kbtu.kz	Mailina 19	19
3	3	Temirlan	Serikov	987.423.1532	t_serikov@kbtu.kz	Tole Bi 59	21
4	4	Anuar	Sarsengaliyev	234.526.749	sars_covid@gmail.com	Turgut Ozała 27	20
5	5	Tamerlan	Kunkash	213.423.1234	t_kvankash@kbtu.kz	Ermekova 39	21

As for the Schools table:

```
create table schools(
    school_id integer constraint pk_school PRIMARY KEY,
    school_address varchar(40) NOT NULL,
    school_name varchar(40) NOT NULL,
    school_phone_number varchar(40) NOT NULL
);

insert into schools values (13, 'Erzhanova 36', 'School 48', '123.222.333');
insert into schools values (26, 'Respublika 22', 'School 97', '423.412.555');
insert into schools values (15, 'Vostok 4', 'School 38', '999.555.234');
insert into schools values (30, 'Tole Bi 6', 'School 100', '754.945.888');
drop table schools;
```

	school_id	school_address	school_name	school_phone_number
1	13	Erzhanova 36	School 48	123.222.333
2	26	Respublika 22	School 97	423.412.555
3	15	Vostok 4	School 38	999.555.234
4	30	Tole Bi 6	School 100	754.945.888

As for the Bowling Centers table:

```
create table bowling_centers(  
    bow_center_id integer constraint pk_bowling_center PRIMARY KEY,  
    bow_center_name varchar(40) NOT NULL,  
    bow_center_address varchar(40) NOT NULL,  
    bow_center_phone_number varchar(40) NOT NULL,  
    bow_center_grade real,  
    constraint upper_limit_grade CHECK (bow_center_grade <=5.0),  
    constraint lower_limit_grade CHECK (bow_center_grade >= 0.0)  
);  
  
insert into bowling_centers values (23,'Fox','Lugovaya 19','213.412.421',4.3);  
insert into bowling_centers values (32,'KBTU','Tole Bi 59','952.123.531',4.5);  
insert into bowling_centers values (45,'SDU','Kaskelen 2','533.135.928',4.0);  
insert into bowling_centers values (55,'KarGU','Universitetskaya 5','314.532.523',3.9);  
drop table bowling_centers;
```

	bow_center_id	bow_center_name	bow_center_address	bow_center_phone_number	bow_center_grade
1	23	Fox	Lugovaya 19	213.412.421	4.3
2	32	KBTU	Tole Bi 59	952.123.531	4.5
3	45	SDU	Kaskelen 2	533.135.928	4
4	55	KarGU	Universitetskaya 5	314.532.523	3.9

As for the Recommendations table:

```
create table recommendations(  
    recommendation_id serial constraint pk_recommendation PRIMARY KEY,  
    recommendation_application_id integer,  
    recommendatio_date date NOT NULL,  
    constraint fk_recommendation FOREIGN KEY (recommendation_application_id) REFERENCES applications(application_id)  
);  
  
insert into recommendations values (2,14,'2020-12-22');  
insert into recommendations values (1,1,'2020-12-20');  
insert into recommendations values (10,9,'2020-12-26');  
insert into recommendations values (15,15,'2020-12-29');  
insert into recommendations values (19,2,'2020-12-30');  
drop table recommendations;
```

	recommendation_id	recommendation_application_id	recommendatio_date
1	2	14	2020-12-22
2	1	1	2020-12-20
3	10	9	2020-12-26
4	15	15	2020-12-29
5	19	2	2020-12-30

Some request exercises:

- 1) Make join of 'Applications' table and 'Bowling_centers' by bowling center id.

```
select * from
applications a join bowling_centers b
on a.application_bowling_center_id = b.bow_center_id;
```

	application_id	application_date	application_student_id	application_bowling_center_id	application_school_id	application_gpa_point
1	1	2021-01-31	1	23	13	3.83
2	14	2021-02-23	3	32	15	3.5
3	9	2021-01-15	2	32	30	4
4	15	2021-01-11	5	55	26	3.9
5	2	2021-01-25	4	45	26	3.6

	bow_center_id	bow_center_name	bow_center_address	bow_center_phone_number	bow_center_grade
	23	Fox	Lugovaya 19	213.412.421	4.3
	32	KBTU	Tole Bi 59	952.123.531	4.5
	32	KBTU	Tole Bi 59	952.123.531	4.5
	55	KarGU	Universitetskaya 5	314.532.523	3.9
	45	SDU	Kaskelen 2	533.135.928	4

- 2) Show student's first name and last name where the length of the name is less than 10 and order by the age (default).

```
87 ✓ select student_first_name, student_last_name from applicants where length(student_first_name) < 10 order by student_age ASC ;
```

	student_first_name	student_last_name
1	Assanali	Moldash
2	Anuar	Sarsengaliev
3	Temirlan	Serikov
4	Tamerlan	Kunkash

- 3) Show all the information of the applicants whose first name starts with 'Temir'.

```
89 select * from applicants where student_first_name like 'Temir%';
```

	student_id	student_first_name	student_last_name	student_phone_number	student_email	student_address	student_age
1	1	Temirbolat	Maratuly	123.456.789	t_maratuly@kbtu.kz	Erzhanova 28	20
2	3	Temirlan	Serikov	987.423.1532	t_serikov@kbtu.kz	Tole Bi 59	21

- 4) Show all the information of the applicants whose GPA is Between 3.5 and 3.8.

```
91 ✓ select * from applicants where
92 student_id IN (select application_student_id from applications where application_gpa_point BETWEEN 3.5 AND 3.8);
```

	student_id	student_first_name	student_last_name	student_phone_number	student_email	student_address	student_age
1	3	Temirlan	Serikov	987.423.1532	t_serikov@kbtu.kz	Tole Bi 59	21
2	4	Anuar	Sarsengaliev	234.526.749	sars_covid@gmail.com	Turgut Ozala 27	20

- 5) Show application date, gpa, first name and last name of the students using the join. Also condition that the application date can be only January.

```
94 select a.application_date, a.application_gpa_point, s.student_first_name, s.student_last_name
95 from applications a join applicants s
96 on a.application_student_id = s.student_id
97 where a.application_date BETWEEN '2021-01-01' AND '2021-01-31';
```

	application_date	application_gpa_point	student_first_name	student_last_name
1	2021-01-31	3.83	Temirbolat	Maratuly
2	2021-01-15	4	Assanali	Moldash
3	2021-01-25	3.6	Anuar	Sarsengaliev
4	2021-01-11	3.9	Tamerlan	Kunkash