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Институт компьютерных наук и технологий

Кафедра компьютерных систем и программных технологий

Отчет по лабораторной работе

Курс: «Операционные системы»

Тема: «Язык SQL-DDL»

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# 1. Цель работы

Познакомиться с основами проектирования схемы БД, языком описания сущностей и ограничений БД SQL-DDL.

# 2. Программа работы

1. Самостоятельное изучение SQL-DDL
2. Создание скрипта БД в соответствии с согласованной схемой (должны присутствовать первичные и внешние ключи, ограничения на диапазоны значений). Продемонстрировать скрипт преподавателю.
3. Создайте скрипт, заполняющий все таблицы БД данными
4. Выполнение SQL-запросов, изменяющих схему созданной БД по заданию преподавателя. Продемонстрировать их работу преподавателю.
5. Изучите основные возможности IBExpert. Получите ER-диаграмму созданной БД с помощью Database Designer.
6. Автоматически сгенерируйте данные при помощи IBExpert (для трех или большего числа таблиц, не менее 100000 записей в каждой из выбранных таблиц)

# 3. Ход работы

В соответствии с диаграммой базы данных из предыдущей работы (Рис. 1), был написан SQL-скрипт, создающий и наполняющий базу данных значениями.

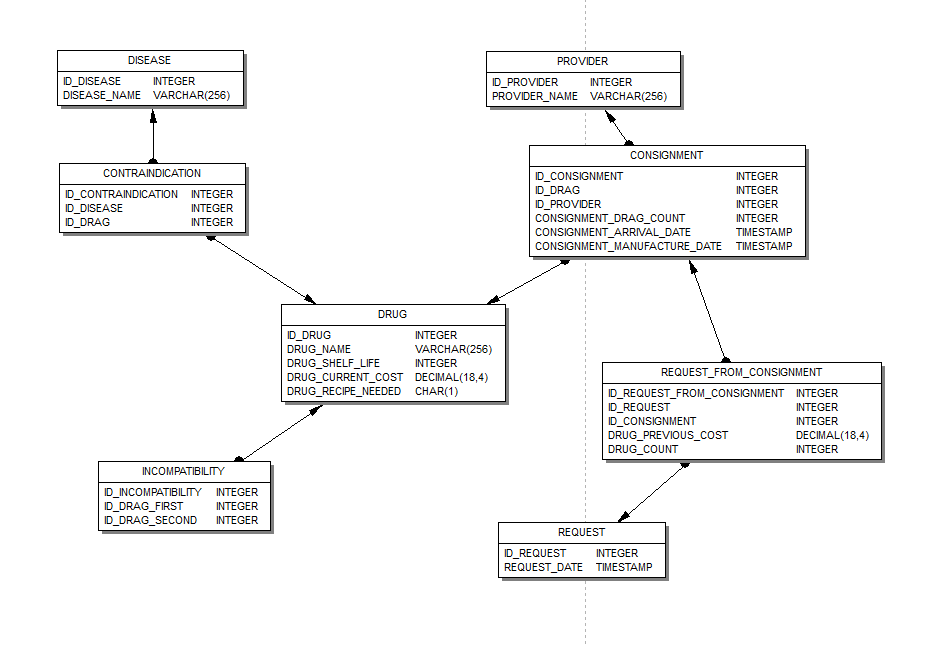


Рис. 1. SQL-диаграмма базы данных

pharmacy.sql:

/\* If database already exists drop it. \*/

CONNECT 'tiger.ftk.spbstu.ru:/var/lib/firebird/435013/pharmacy.fdb' USER 'SYSDBA' PASSWORD 'masterkey';

DROP DATABASE;

/\* Create database and connect. \*/

CREATE DATABASE 'tiger.ftk.spbstu.ru:/var/lib/firebird/435013/pharmacy.fdb' USER 'SYSDBA' PASSWORD 'masterkey';

CONNECT 'tiger.ftk.spbstu.ru:/var/lib/firebird/435013/pharmacy.fdb' USER 'SYSDBA' PASSWORD 'masterkey';

/\* Set charset. \*/

SET NAMES CYRL;

/\* Create tables. \*/

CREATE TABLE DISEASE

(

ID\_DISEASE INTEGER NOT NULL,

DISEASE\_NAME VARCHAR(256) NOT NULL COLLATE NONE,

CONSTRAINT PK\_DISEASE PRIMARY KEY (ID\_DISEASE)

);

COMMIT;

CREATE TABLE DRUG

(

ID\_DRUG INTEGER NOT NULL,

DRUG\_NAME VARCHAR(256) NOT NULL COLLATE NONE,

DRUG\_SHELF\_LIFE INTEGER NOT NULL,

DRUG\_CURRENT\_COST DECIMAL(18,4) NOT NULL,

DRUG\_RECIPE\_NEEDED CHAR(1) NOT NULL,

CONSTRAINT PK\_DRUG PRIMARY KEY (ID\_DRUG)

);

COMMIT;

CREATE TABLE CONTRAINDICATION

(

ID\_CONTRAINDICATION INTEGER NOT NULL,

ID\_DISEASE INTEGER NOT NULL REFERENCES DISEASE,

ID\_DRAG INTEGER NOT NULL REFERENCES DRUG,

CONSTRAINT PK\_CONTRAINDICATION PRIMARY KEY (ID\_CONTRAINDICATION)

);

COMMIT;

CREATE TABLE INCOMPATIBILITY

(

ID\_INCOMPATIBILITY INTEGER NOT NULL,

ID\_DRAG\_FIRST INTEGER NOT NULL REFERENCES DRUG,

ID\_DRAG\_SECOND INTEGER NOT NULL REFERENCES DRUG,

CONSTRAINT PK\_INCOMPATIBILITY PRIMARY KEY (ID\_INCOMPATIBILITY)

);

COMMIT;

CREATE TABLE PROVIDER

(

ID\_PROVIDER INTEGER NOT NULL,

PROVIDER\_NAME VARCHAR(256) NOT NULL,

CONSTRAINT PK\_PROVIDER PRIMARY KEY (ID\_PROVIDER)

);

COMMIT;

CREATE TABLE CONSIGNMENT

(

ID\_CONSIGNMENT INTEGER NOT NULL,

ID\_DRAG INTEGER NOT NULL REFERENCES DRUG,

ID\_PROVIDER INTEGER NOT NULL REFERENCES PROVIDER,

CONSIGNMENT\_DRAG\_COUNT INTEGER NOT NULL,

CONSIGNMENT\_ARRIVAL\_DATE TIMESTAMP NOT NULL,

CONSIGNMENT\_MANUFACTURE\_DATE TIMESTAMP NOT NULL,

CONSTRAINT PK\_CONSIGNMENT PRIMARY KEY (ID\_CONSIGNMENT)

);

COMMIT;

CREATE TABLE REQUEST

(

ID\_REQUEST INTEGER NOT NULL,

REQUEST\_DATE TIMESTAMP NOT NULL,

CONSTRAINT PK\_REQUEST PRIMARY KEY (ID\_REQUEST)

);

COMMIT;

CREATE TABLE REQUEST\_FROM\_CONSIGNMENT

(

ID\_REQUEST\_FROM\_CONSIGNMENT INTEGER NOT NULL,

ID\_REQUEST INTEGER NOT NULL REFERENCES REQUEST,

ID\_CONSIGNMENT INTEGER NOT NULL REFERENCES CONSIGNMENT,

DRUG\_PREVIOUS\_COST DECIMAL(18,4) NOT NULL,

DRUG\_COUNT INTEGER NOT NULL,

CONSTRAINT PK\_REQUEST\_FROM\_CONSIGNMENT PRIMARY KEY (ID\_REQUEST\_FROM\_CONSIGNMENT)

);

COMMIT;

/\* Insert into tables some data. \*/

INSERT INTO DISEASE (ID\_DISEASE, DISEASE\_NAME) VALUES (1, 'Ветрянка');

INSERT INTO DISEASE (ID\_DISEASE, DISEASE\_NAME) VALUES (2, 'Корь');

INSERT INTO DISEASE (ID\_DISEASE, DISEASE\_NAME) VALUES (3, 'ОРЗ');

INSERT INTO DISEASE (ID\_DISEASE, DISEASE\_NAME) VALUES (4, 'Язва');

INSERT INTO DISEASE (ID\_DISEASE, DISEASE\_NAME) VALUES (5, 'Импотенция');

COMMIT;

INSERT INTO DRUG (ID\_DRUG, DRUG\_NAME, DRUG\_SHELF\_LIFE, DRUG\_CURRENT\_COST, DRUG\_RECIPE\_NEEDED)

VALUES (1, 'Аспирин', 30, 32.22, 0);

INSERT INTO DRUG (ID\_DRUG, DRUG\_NAME, DRUG\_SHELF\_LIFE, DRUG\_CURRENT\_COST, DRUG\_RECIPE\_NEEDED)

VALUES (2, 'Нурафен', 40, 55.10, 0);

INSERT INTO DRUG (ID\_DRUG, DRUG\_NAME, DRUG\_SHELF\_LIFE, DRUG\_CURRENT\_COST, DRUG\_RECIPE\_NEEDED)

VALUES (3, 'Аспоркам', 20, 69.80, 1);

INSERT INTO DRUG (ID\_DRUG, DRUG\_NAME, DRUG\_SHELF\_LIFE, DRUG\_CURRENT\_COST, DRUG\_RECIPE\_NEEDED)

VALUES (4, 'Ношпа', 35, 20.90, 0);

INSERT INTO DRUG (ID\_DRUG, DRUG\_NAME, DRUG\_SHELF\_LIFE, DRUG\_CURRENT\_COST, DRUG\_RECIPE\_NEEDED)

VALUES (5, 'Диазолин', 50, 11.0, 0);

INSERT INTO DRUG (ID\_DRUG, DRUG\_NAME, DRUG\_SHELF\_LIFE, DRUG\_CURRENT\_COST, DRUG\_RECIPE\_NEEDED)

VALUES (6, 'Мезим', 30, 41.20, 0);

INSERT INTO DRUG (ID\_DRUG, DRUG\_NAME, DRUG\_SHELF\_LIFE, DRUG\_CURRENT\_COST, DRUG\_RECIPE\_NEEDED)

VALUES (7, 'Регидрон', 70, 5.40, 0);

INSERT INTO DRUG (ID\_DRUG, DRUG\_NAME, DRUG\_SHELF\_LIFE, DRUG\_CURRENT\_COST, DRUG\_RECIPE\_NEEDED)

VALUES (8, 'Флуоксетин', 50, 15.40, 1);

INSERT INTO DRUG (ID\_DRUG, DRUG\_NAME, DRUG\_SHELF\_LIFE, DRUG\_CURRENT\_COST, DRUG\_RECIPE\_NEEDED)

VALUES (9, 'Супрадин', 30, 25.0, 0);

COMMIT;

INSERT INTO INCOMPATIBILITY (ID\_INCOMPATIBILITY, ID\_DRAG\_FIRST, ID\_DRAG\_SECOND) VALUES (1, 1, 8);

INSERT INTO INCOMPATIBILITY (ID\_INCOMPATIBILITY, ID\_DRAG\_FIRST, ID\_DRAG\_SECOND) VALUES (2, 2, 3);

INSERT INTO INCOMPATIBILITY (ID\_INCOMPATIBILITY, ID\_DRAG\_FIRST, ID\_DRAG\_SECOND) VALUES (3, 1, 2);

INSERT INTO INCOMPATIBILITY (ID\_INCOMPATIBILITY, ID\_DRAG\_FIRST, ID\_DRAG\_SECOND) VALUES (4, 4, 3);

INSERT INTO INCOMPATIBILITY (ID\_INCOMPATIBILITY, ID\_DRAG\_FIRST, ID\_DRAG\_SECOND) VALUES (5, 6, 8);

INSERT INTO INCOMPATIBILITY (ID\_INCOMPATIBILITY, ID\_DRAG\_FIRST, ID\_DRAG\_SECOND) VALUES (6, 3, 7);

INSERT INTO INCOMPATIBILITY (ID\_INCOMPATIBILITY, ID\_DRAG\_FIRST, ID\_DRAG\_SECOND) VALUES (7, 9, 1);

INSERT INTO INCOMPATIBILITY (ID\_INCOMPATIBILITY, ID\_DRAG\_FIRST, ID\_DRAG\_SECOND) VALUES (8, 3, 4);

COMMIT;

INSERT INTO CONTRAINDICATION (ID\_CONTRAINDICATION, ID\_DISEASE, ID\_DRAG) VALUES (1, 4, 8);

INSERT INTO CONTRAINDICATION (ID\_CONTRAINDICATION, ID\_DISEASE, ID\_DRAG) VALUES (2, 4, 3);

INSERT INTO CONTRAINDICATION (ID\_CONTRAINDICATION, ID\_DISEASE, ID\_DRAG) VALUES (3, 1, 6);

INSERT INTO CONTRAINDICATION (ID\_CONTRAINDICATION, ID\_DISEASE, ID\_DRAG) VALUES (4, 1, 2);

INSERT INTO CONTRAINDICATION (ID\_CONTRAINDICATION, ID\_DISEASE, ID\_DRAG) VALUES (5, 3, 3);

INSERT INTO CONTRAINDICATION (ID\_CONTRAINDICATION, ID\_DISEASE, ID\_DRAG) VALUES (6, 3, 7);

INSERT INTO CONTRAINDICATION (ID\_CONTRAINDICATION, ID\_DISEASE, ID\_DRAG) VALUES (7, 3, 9);

INSERT INTO CONTRAINDICATION (ID\_CONTRAINDICATION, ID\_DISEASE, ID\_DRAG) VALUES (8, 4, 2);

INSERT INTO CONTRAINDICATION (ID\_CONTRAINDICATION, ID\_DISEASE, ID\_DRAG) VALUES (9, 5, 6);

INSERT INTO CONTRAINDICATION (ID\_CONTRAINDICATION, ID\_DISEASE, ID\_DRAG) VALUES (10, 5, 1);

INSERT INTO CONTRAINDICATION (ID\_CONTRAINDICATION, ID\_DISEASE, ID\_DRAG) VALUES (11, 2, 4);

INSERT INTO CONTRAINDICATION (ID\_CONTRAINDICATION, ID\_DISEASE, ID\_DRAG) VALUES (12, 2, 5);

COMMIT;

INSERT INTO PROVIDER (ID\_PROVIDER, PROVIDER\_NAME) VALUES (1, 'Добрый доктор');

INSERT INTO PROVIDER (ID\_PROVIDER, PROVIDER\_NAME) VALUES (2, 'Доставщики9000');

INSERT INTO PROVIDER (ID\_PROVIDER, PROVIDER\_NAME) VALUES (3, 'Фармаштекер');

INSERT INTO PROVIDER (ID\_PROVIDER, PROVIDER\_NAME) VALUES (4, 'Компания Бориса');

INSERT INTO PROVIDER (ID\_PROVIDER, PROVIDER\_NAME) VALUES (5, 'Доктор силач');

COMMIT;

INSERT INTO CONSIGNMENT (ID\_CONSIGNMENT, ID\_DRAG, ID\_PROVIDER, CONSIGNMENT\_DRAG\_COUNT, CONSIGNMENT\_ARRIVAL\_DATE, CONSIGNMENT\_MANUFACTURE\_DATE)

VALUES (1, 5, 3, 120, '01-10-2011', '09-25-2010');

INSERT INTO CONSIGNMENT (ID\_CONSIGNMENT, ID\_DRAG, ID\_PROVIDER, CONSIGNMENT\_DRAG\_COUNT, CONSIGNMENT\_ARRIVAL\_DATE, CONSIGNMENT\_MANUFACTURE\_DATE)

VALUES (2, 2, 5, 1000, '02-13-2011', '02-11-2011');

INSERT INTO CONSIGNMENT (ID\_CONSIGNMENT, ID\_DRAG, ID\_PROVIDER, CONSIGNMENT\_DRAG\_COUNT, CONSIGNMENT\_ARRIVAL\_DATE, CONSIGNMENT\_MANUFACTURE\_DATE)

VALUES (3, 7, 4, 300, '01-14-2011', '01-10-2011');

INSERT INTO CONSIGNMENT (ID\_CONSIGNMENT, ID\_DRAG, ID\_PROVIDER, CONSIGNMENT\_DRAG\_COUNT, CONSIGNMENT\_ARRIVAL\_DATE, CONSIGNMENT\_MANUFACTURE\_DATE)

VALUES (4, 1, 2, 300, '02-15-2011', '02-01-2011');

INSERT INTO CONSIGNMENT (ID\_CONSIGNMENT, ID\_DRAG, ID\_PROVIDER, CONSIGNMENT\_DRAG\_COUNT, CONSIGNMENT\_ARRIVAL\_DATE, CONSIGNMENT\_MANUFACTURE\_DATE)

VALUES (5, 3, 1, 600, '01-10-2011', '11-11-2010');

INSERT INTO CONSIGNMENT (ID\_CONSIGNMENT, ID\_DRAG, ID\_PROVIDER, CONSIGNMENT\_DRAG\_COUNT, CONSIGNMENT\_ARRIVAL\_DATE, CONSIGNMENT\_MANUFACTURE\_DATE)

VALUES (6, 4, 1, 200, '01-20-2011', '12-20-2010');

INSERT INTO CONSIGNMENT (ID\_CONSIGNMENT, ID\_DRAG, ID\_PROVIDER, CONSIGNMENT\_DRAG\_COUNT, CONSIGNMENT\_ARRIVAL\_DATE, CONSIGNMENT\_MANUFACTURE\_DATE)

VALUES (7, 5, 5, 100, '01-24-2011', '01-21-2011');

INSERT INTO CONSIGNMENT (ID\_CONSIGNMENT, ID\_DRAG, ID\_PROVIDER, CONSIGNMENT\_DRAG\_COUNT, CONSIGNMENT\_ARRIVAL\_DATE, CONSIGNMENT\_MANUFACTURE\_DATE)

VALUES (8, 8, 3, 1000, '02-10-2011', '02-09-2011');

COMMIT;

INSERT INTO REQUEST (ID\_REQUEST, REQUEST\_DATE) VALUES (1, '03-17-2011');

INSERT INTO REQUEST (ID\_REQUEST, REQUEST\_DATE) VALUES (2, '04-02-2011');

INSERT INTO REQUEST (ID\_REQUEST, REQUEST\_DATE) VALUES (3, '03-11-2011');

INSERT INTO REQUEST (ID\_REQUEST, REQUEST\_DATE) VALUES (4, '04-22-2011');

INSERT INTO REQUEST (ID\_REQUEST, REQUEST\_DATE) VALUES (5, '03-10-2011');

INSERT INTO REQUEST (ID\_REQUEST, REQUEST\_DATE) VALUES (6, '04-28-2011');

INSERT INTO REQUEST (ID\_REQUEST, REQUEST\_DATE) VALUES (7, '04-10-2011');

INSERT INTO REQUEST (ID\_REQUEST, REQUEST\_DATE) VALUES (8, '03-02-2011');

COMMIT;

INSERT INTO REQUEST\_FROM\_CONSIGNMENT (ID\_REQUEST\_FROM\_CONSIGNMENT, ID\_REQUEST, ID\_CONSIGNMENT, DRUG\_PREVIOUS\_COST, DRUG\_COUNT)

VALUES (1, 2, 7, 15.0, 10);

INSERT INTO REQUEST\_FROM\_CONSIGNMENT (ID\_REQUEST\_FROM\_CONSIGNMENT, ID\_REQUEST, ID\_CONSIGNMENT, DRUG\_PREVIOUS\_COST, DRUG\_COUNT)

VALUES (2, 3, 6, 25.0, 5);

INSERT INTO REQUEST\_FROM\_CONSIGNMENT (ID\_REQUEST\_FROM\_CONSIGNMENT, ID\_REQUEST, ID\_CONSIGNMENT, DRUG\_PREVIOUS\_COST, DRUG\_COUNT)

VALUES (3, 4, 5, 70.0, 2);

INSERT INTO REQUEST\_FROM\_CONSIGNMENT (ID\_REQUEST\_FROM\_CONSIGNMENT, ID\_REQUEST, ID\_CONSIGNMENT, DRUG\_PREVIOUS\_COST, DRUG\_COUNT)

VALUES (4, 1, 1, 15.0, 20);

INSERT INTO REQUEST\_FROM\_CONSIGNMENT (ID\_REQUEST\_FROM\_CONSIGNMENT, ID\_REQUEST, ID\_CONSIGNMENT, DRUG\_PREVIOUS\_COST, DRUG\_COUNT)

VALUES (5, 7, 4, 35.0, 10);

INSERT INTO REQUEST\_FROM\_CONSIGNMENT (ID\_REQUEST\_FROM\_CONSIGNMENT, ID\_REQUEST, ID\_CONSIGNMENT, DRUG\_PREVIOUS\_COST, DRUG\_COUNT)

VALUES (6, 8, 3, 10.0, 40);

COMMIT;

Скрипт создает базу данных (если база данных уже создана, то удаляет старую), подключается к ней, устанавливает кодировку, создает таблицы со связями и наполняет их значениями.

# 5. Вывод