COSC265 Lab Test 2016

Time allowed: 90 min
Total marks: 100
Worth: 20%
Open book

There are 4 questions. The last question is optional and does not count towards your mark for the test. You should attempt that question only if you have finished all other questions.

Your answers should be clear and concise - material not relevant to the question will earn no marks whether or not it is correct.

Remember to keep saving your work as you go, as it will be impossible to retrieve your work from Oracle once you have logged out. **Create a text file named with your usercode (e.g. *abc12.txt*), and include in it all SQL statements that you execute to answer the questions. Some questions additionally ask for the resulting data to be submitted. Include enough detail in your answer to show that what you have done is correct.**

Make sure that you submit all the work done. You can submit the answers via Learn.

A database contains information necessary for the day-to-day operation of a company which offers in-water storage to boat owners, by providing boat slips that boat owners can rent on an annual basis. The company owns a number of marinas. Each marina has several boat slips available. The company also provides a variety of repair and maintenance services to owners who rent slips.

First of all, you need to run the Oracle script (marina-script.sql) which contains the statements to create and populate four tables of this database. The MARINA relation stores the unique code for each marina, its name and address. The BOAT_OWNER relation stores the unique number for each owner, his/her name and address. The SLIP table contains information about each slip. The primary key consists of the slip number and marina id. The table also contains the length of the slip (in feet), and the annual rental fee. If the slip is rented, the table also contains the name of the boat, its type and the owner's id. Finally, the SERVICE table contains the type of service (a unique number) and a description.

```
create table MARINA
(id integer not null constraint check_marinaid check (id > 0),
 name varchar(30) not null,
 address varchar(50) not null,
 constraint pk_marina primary key (id));


create table boat_owner
(OwnerNo integer not null constraint check_owner check (OwnerNo > 0),
 Fname varchar(15) not null,
 Lname varchar(15) not null,
 Address varchar (50) not null,
 constraint pk_owner primary key (OwnerNo));


create table Slip
(SlipId integer not null constraint check_slip check (SlipId > 0),
 Marina integer not null constraint slip_fk1 references marina,
 Length /* length in feet */ integer not null
       constraint check_length check (length between 5 and 50),
 Fee number not null,
 Boat varchar(12),
 Type varchar(15),
 Owner integer constraint slip_fk2 references Boat_Owner,
 constraint slip_pk primary key (SlipId,Marina));


create table Service
(type integer not null check (type > 0) primary key,
 description varchar(30) not null);
```

Question 1 (30 marks for the whole question)

a) Once you log on to Oracle, please execute *set autocommit on;*

b) (10 marks) List the names of owners who own two or more boats of the same type. Show the boat type too.

c) (10 marks) Define the *Income* view which shows the total rental fee for the different lengths of slips. Use this view to define a query to find the category (i.e. the slip length) which is most profitable.

d) (10 marks) Peter Norton has bought a Dolphin 25 boat named "White Dove," and has rented slip 2 from marina 4. Write a single SQL statement to change the Slip table. Make sure that you do not overwrite any data about the boat that might already occupy that slip. Is the change reflected in the Income view?

Question 2 (30 marks for the whole question)

a) (15 marks) Create the REQUEST table, which contains a tuple for each service request. A request is identified by a unique number. The table should also contain the slip and marina number (to identify the boat), type of the requested service, status ("n" for new, "p" for in progress or "c" for completed), the estimated number of hours, the actual number of hours, and description of the work to be done (mandatory text, maximally 100 characters).

b) (5 marks) Populate the table with the provided data. Show how many tuples there are in your table.

c) (10 marks) Find all new service requests with a service description involving engine in marina 1, which require less than 5 hours. List the boat type, slip number and owner's name. Use only a single SQL statement.

Question 3 (40 marks for the whole question)

a) (10 marks) Create the SLIP30 view, which contains information about 30-feet slips. The view should include the slip number, marina number, fee, boat name, and the name of the owner (if the slip is occupied).

b) (10 marks) Write an SQL statement to update the SLIP30 view by specifying that slip 5 in marina 2 is now occupied by the boat named "Star" owned by Peter Faulkner. Explain what happens when the statement is executed.

c) (20 marks) Write a trigger that updates the database correctly for the situation in Question 3b). Demonstrate that your trigger works.

Question 4 (No marks; a correct answer will be awarded a chocolate fish)

Find names of owners who have more than one type of boat. Show how many types of boats they have.