CS 448 – Homework 3   Due Date: Feb. 11, 2010

1) Consider the following relational schema; the schema describes a database containing data about theses carried out by students of a master degree. Theses have supervisors and co-supervisors. The underlined attributes denote the primary keys of the relations. The column Prof# in the relation Theses indicates the professors that are supervisors.

    Students (S#, FName, LName, Street, City, Phone#)
    Theses (T#, Title, Topic, Prof#, S#, Evaluation)
    Professors (Prof#, PName, Rank, Phone#, Dept#)
    Theses-Co-Supervisors (T#, Prof#)

(a) (pt.10) Determine which is the correct predicate for retrieving the theses whose title contains the word database:

(i) Title = ‘database’
(ii) Title LIKE ‘database’
(iii) Title LIKE ‘%database%’
(iv) None of the above

(b) (pt. 10) Determine which is the correct query for retrieving the name and rank of the professor who is the supervisor of the thesis of student ‘Bob Greensmith’:

(i) SELECT PName, Rank from Students, Theses, Professors WHERE FName = ‘Bob’ AND LName = ‘Greensmith’ AND Students.S# = Theses.$# AND Theses.Prof# = Professors.Prof#;

(ii) SELECT PName, Rank from Students, Theses, Professors WHERE FName = ‘Bob’ AND LName = ‘Greensmith’ AND Students.S# = Theses.$# OR Theses.Prof# = Professors.Prof#;

(iii) SELECT PName, Rank from Students, Theses, Professors WHERE FName = ‘Bob’ AND LName = ‘Greensmith’ OR Students.S# = Theses.$# OR Theses.Prof# = Professors.Prof#;

(iv) None of the above.

(c) (pt. 10) Determine which is the correct query for retrieving retrieve the name of the professor who is the co-supervisor of the thesis by student ‘Bob Greensmith:

(i) SELECT PName from Students, Theses, Professors WHERE FName = ‘Bob’ AND LName = ‘Greensmith’ AND Students.S# = Theses.$# AND Theses.Prof# = Professors.Prof#;

(ii) SELECT PName from Students, Theses, Professors, Theses-Co-Supervisors WHERE FName = ‘Bob’ AND LName = ‘Greensmith’ AND Students.S# = Theses.$# AND Theses.T# = Theses-Co-Supervisors.T# AND Professors.Prof# = Theses-Co-Supervisors.Prof#;

(iii) SELECT PName from Students, Theses, Professors, Theses-Co-Supervisors WHERE FName = ‘Bob’ AND LName = ‘Greensmith’ AND Students.S# = Theses.$# AND Theses.T# = Theses-Co-Supervisors.T# AND Professors.Prof# = Theses-Co-Supervisors.Prof#;

(iv) None of the above.
(d) (pt 15) Write an SQL query that retrieves the S# of each student that has the last name equal to the city where the student lives (for example a student whose last name is ‘Lafayette’ and lives in Lafayette would be returned by this query).

2) Consider the following two table definitions:

CREATE TABLE Tab1
(A: INTEGER,
 B: INTEGER,
 C: INTEGER);

CREATE TABLE Tab2
(B: INTEGER,
 C: INTEGER,
 D: INTEGER);

Suppose that these two tables have the following contents (the symbol ? denotes null values):

<table>
<thead>
<tr>
<th>Tab1</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>10</td>
<td>500</td>
<td>?</td>
</tr>
<tr>
<td>20</td>
<td>700</td>
<td>100</td>
</tr>
<tr>
<td>30</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>40</td>
<td>600</td>
<td>600</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tab2</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>850</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>?</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>700</td>
<td>100</td>
<td>1900</td>
<td></td>
</tr>
<tr>
<td>?</td>
<td>20</td>
<td>1200</td>
<td></td>
</tr>
</tbody>
</table>

(i) (10 pt) Indicate the result of the following SQL query:
SELECT A, Tab1.B, Tab1.C FROM Tab1 NATURAL LEFT OUTER JOIN Tab2;

(ii) (10 pt) Indicate the result of the following SQL query:
SELECT A, Tab1.B, Tab1.C FROM Tab1 NATURAL RIGHT OUTER JOIN Tab2;

(iii) (10pt) Indicate the result of the following SQL query:
SELECT A, Tab1.B, D FROM Tab1 NATURAL RIGHT OUTER JOIN Tab2;

(iv) (10 pt) Indicate the result of the following SQL query:
SELECT A from Tab1 WHERE B=C;

(v) (15 pt) Indicate the result of the following SQL query:
SELECT A, B from Tab1, Tab2 WHERE Tab1.B = Tab2.B;