

Suggested RC solutions on odd numbered problems for the toyu DB Queries

1. Show all student names.

TRC:

$\{(s.fName, s.lName) \mid s \in \text{student}\}$

DRC:

$\{(fName, lName) \mid (_, lName, fName, _, _, _) \in \text{student}\}$

3. Show the names and credits of students majoring in 'CSCI'.

TRC:

$\{(s.fName, s.lName, s.credits) \mid s \in \text{student}, s.major = 'CSCI'\}$

DRC:

$\{(fName, lName, credits) \mid (_, lName, fName, 'CSCI', _, credits, _) \in \text{student}\}$

5. Show the id of students enrolled in class with id 10000.

TRC:

$\{(e.stuid) \mid e \in \text{enroll}, e.classId = 10000\}$

DRC:

$\{(stuid) \mid (stuid, 10000, _, _) \in \text{enroll}\}$

7. Show the names of departments with faculty in the rank of 'Professor'.

TRC:

$\{(d.deptName) \mid d \in \text{department}, f \in \text{faculty}, d.deptCode = f.deptCode, f.rank = 'Professor'\}$

DRC:

$\{(deptName) \mid (deptCode, deptName, _, _) \in \text{department}, (_, _, _, deptCode, 'Professor') \in \text{faculty}\}$

9. Show the names and major names of every student.

TRC:

$\{(s.fName, s.lName, d.deptName) \mid s \in \text{student}, d \in \text{department}, s.major = d.deptCode\}$

DRC:

$\{(fName, s.lName, deptName) \mid (_, lName, fName, major, _, _, _) \in \text{student}, (major, deptName, _, _) \in \text{department}\}$

11. Show the names for all students who have received a grade A in a class offered by a faculty from the CSCI department.

TRC:

$\{(s.fName, s.lName) \mid s \in \text{student}, e \in \text{enroll}, c \in \text{class}, f \in \text{faculty}, s.stuid = e.stuid, e.classId = c.classId, c.facId = f.facId, e.grade = 'A', f.deptCode = 'CSCI'\}$

DRC:

$\{(fName, lName) \mid (stuid, lName, fName, _, _, _) \in \text{student}, (stuid, classId, 'A', _) \in \text{enroll}, (classId, _, _, _, facId, _) \in \text{class}, (facId, _, _, 'CSCI', _) \in \text{faculty}\}$

13. Show the student names and their major names for all students who have received a grade A in a class offered by a faculty from the department with name 'Computer Science'.

TRC:

$\{(s.fName, s.lName, d1.deptName) \mid s \in \text{student}, e \in \text{enroll}, c \in \text{class}, f \in \text{faculty}, d1 \in \text{department}, d2 \in \text{department}, s.stuid = e.stuid, e.classId = c.classId, c.facId = f.facId, e.grade = 'A', s.major = d1.deptCode, f.deptCode = d2.deptCode, d2.deptName = 'Computer Science'\}$

DRC:

$\{(fName, lName, deptName) \mid (stuid, lName, fName, major, _, _, _) \in \text{student}, (stuid, classId, 'A', _) \in \text{enroll}, (classId, _, _, _, facId, _) \in \text{class}, (facId, _, _, deptCode_2, _) \in \text{faculty}, (major, deptName, _, _) \in \text{department}, (deptCode_2, 'Computer Science', _, _) \in \text{department}\}$

15. Show the classId, facId, and room of all classes with student 100001 or 100002 enrolled.

TRC:

$\{(c.classId, c.facId, c.room) \mid c \in \text{class}, e \in \text{enroll}, c.classId = e.classId, (e.stuid = 100001 \vee e.stuid = 100002)\}$

DRC:

$\{(classId, facId, room) \mid (classId, _, _, _, facId, room) \in \text{class}, (stuid, classId, _, _) \in \text{enroll}, (stuid = 100001 \vee stuid = 100002)\}$

17. Show the classId, facId and room of all classes with student 100001, but not 100002 enrolled.

TRC:

$\{(c.classId, c.facId, c.room) \mid c \in \text{class}, e \in \text{enroll}, c.classId = e.classId, e.stuid = 100001, (e2 \notin \text{enroll} \vee c.classId \neq e2.classId \vee e2.stuid \neq 100002)\}$

DRC:

$\{(classId, facId, room) \mid (classId, _, _, _, facId, room) \in \text{class}, (100001, classId, _, _) \in \text{enroll}, (100001, classId, _, _) \notin \text{enroll}\}$

19. Show the ids and names of students who are enrolled in classes in two or more rooms.

TRC:

$\{(s.stuid, s.fName, s.lName) \mid s \in \text{student}, e1 \in \text{enroll}, s.stuid = e1.stuid, c1 \in \text{class}, e1.classId = c1.classId, e2 \in \text{enroll}, s.stuid = e2.stuid, c2 \in \text{class}, e2.classId = c2.classId, c1.room} \neq c2.room\}$

DRC:

$\{(stuid, fName, lName) \mid (stuid, lName, fName, _, _, _) \in \text{student}, (stuid, classId_1, _, _) \in \text{enroll}, (classId_1, _, _, _, room_1) \in \text{class}, (stuid, classId_2, _, _) \in \text{enroll}, (classId_2, _, _, _, room_2) \in \text{class}, room_1} \neq room_2\}$

21. Show the names and major names of students who have taken both classes 10001 and 10002.

TRC:

$\{(s.fName, s.lName, d.deptName) \mid s \in \text{student}, e1 \in \text{enroll}, e2 \in \text{enroll}, d \in \text{department}, s.stuid = e1.stuid, s.stuid = e2.stuid, s.major = d.deptCode, e1.classId = 10001, e2.classId = 10002\}$

DRC:

$\{(fName, lName, deptName) \mid (stuid, lName, fName, major, _, _) \in \text{student}, (stuid, 10001, _, _) \in \text{enroll}, (stuid, 10002, _, _) \in \text{enroll}, (major, deptName, _, _) \in \text{department}\}$

23. Show the id of students who have enrolled in the class 10000 with a grade B or better.

TRC:

$\{(e.stuid) \mid e \in \text{enroll}, e.classId = 10000, e.grade \in ('A', 'A-', 'B+', 'B')\}$

DRC:

$\{(stuid) \mid (stuid, 10000, grade, _) \in \text{enroll}, grade \in ('A', 'A-', 'B+', 'B')\}$