CS-353 HW-3
Section 2

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Q.1

a)
SELECT s_id, s_name
FROM student
WHERE department = 'CS' AND cgpa > 3.0;

b)
SELECT c_id, c_name
FROM course, membership, club, student
WHERE student.cgpa > 2.0 AND student.s_id = membership.s_id AND
membership.club_id = club.club_id AND club.course_id = course.c_id;

c)
SELECT course.c_id, course.c_name, COUNT(*) as cnt
FROM club, membership
WHERE club.club_id = membership.club_id
GROUP BY club.course_id
HAVING cnt > 100, course
WHERE course.c_id = club.course_id;

d)
WITH temp1 AS (
        SELECT course.c_id, COUNT(*) as cnt
        FROM club, membership
        WHERE club.club_id = membership.club_id
        GROUP BY club.course_id, course.c_id
), temp2 AS (
        SELECT MAX(cnt) as max_cnt FROM temp1
)
SELECT course.c_id, course.c_name
FROM club, membership, temp1, temp2
WHERE club.club_id = membership.club_id AND club.course_id = course.c_id AND temp1.c_id =
course.c_id AND temp1.cnt = temp2.max_cnt;

Q.2

a)
SELECT Students.TCK, Students.sname
FROM Students, Courses, Grades
WHERE Students.TCK = Grades.TCK
AND Courses.cid = Grades.cid
AND Courses.credit = 4
AND Courses.cdept = 'CS'
AND Grades.grade > 90;

b)
```
SELECT Students.TCK, Students.sname
FROM Students
WHERE Students.sdept = 'CS'
AND Students.cgpa > 3.50
AND Students.TCK NOT IN (
    SELECT DISTINCT Grades.TCK
    FROM Grades, Courses
    WHERE Grades.cid = Courses.cid
    AND Courses.cdept = 'EE'
);
```

c)
```
SELECT TCK, sname
FROM Students
WHERE sdept = 'CS'
AND cgpa = (SELECT MAX(cgpa) FROM Students WHERE sdept = 'CS');
```

d)
```
SELECT cid, cname
FROM Courses
WHERE cdept = 'CS'
AND cid IN (
        SELECT DISTINCT cid
        FROM Grades
        WHERE TCK IN (
        SELECT DISTINCT TCK
        FROM Students
        GROUP BY TCK
        HAVING COUNT(DISTINCT sdept) >= 5
        )
);
```

e)
```
SELECT TCK, sname
FROM Students
WHERE TCK IN (
        SELECT TCK
        FROM Grades
        WHERE grade = 100
        GROUP BY TCK
        HAVING COUNT(*) >= 5
);
```

f)
```
SELECT Courses.cdept, Courses.cname, AVG(Grades.grade)
FROM Courses, Grades
WHERE Courses.cid = Grades.cid
GROUP BY Courses.cdept, Courses.cname
ORDER BY Courses.cdept ASC;
```

g)
```
SELECT g1.cid, c1.cname, c1.cdept
FROM Grades AS g1, Courses AS c1
WHERE g1.cid = c1.cid AND c1.cdept = 'CS' AND NOT EXISTS (
        SELECT 1
        FROM Courses AS c2, Grades AS g2, Students AS s2
        WHERE c2.cid = g2.cid AND g1.TCK = g2.TCK AND s2.TCK = g2.TCK AND
        s2.sdept <> 'CS'
) GROUP BY g1.cid, c1.cname, c1.cdept
HAVING COUNT(DISTINCT g1.TCK) >= 5
ORDER BY c1.cdept ASC;
```

h)
```
SELECT s.TCK, s.sname
FROM Students s
WHERE s.cgpa > (
  SELECT AVG(s2.cgpa)
  FROM Students s2
  WHERE s.sdept = s2.sdept
)
```

i)
```
SELECT TCK, sname, sdept, cgpa
FROM Students S1
WHERE cgpa = (
  SELECT MAX(cgpa)
  FROM Students S2
  WHERE S1.sdept = S2.sdept
)
ORDER BY sdept;
```

j)
```
SELECT DISTINCT G1.TCK, G2.TCK
FROM Grades G1, Grades G2
WHERE G1.TCK < G2.TCK
AND G1.cid = G2.cid
AND (
  SELECT COUNT(*)
  FROM Grades G3, Grades G4
  WHERE G3.TCK = G1.TCK
  AND G4.TCK = G2.TCK
  AND G3.cid = G4.cid
) >= 10
AND G1.TCK IN (
        SELECT TCK
        FROM Students
        WHERE sdept <> G2.sdept
) AND G2.TCK IN (
        SELECT TCK
        FROM Students
        WHERE sdept <> G1.sdept
);
```