CS 353 Spring 2024
Homework 3 Solutions

Q.1 [80 pts, 8 pts each]

(a)
SELECT E.TCK-no, E.ename
FROM Employee E, Department D
WHERE E.dept-no = D.dept-no AND D.city = "Ankara" AND D.dbudget > 10,000,000

(b)
SELECT P.proj-no, P.pname
FROM Project P, Employee E, Department D
WHERE P.leader-TCK = E.TCK-no AND E.nationality = "Turkey" AND
   E.dept-no = D.dept-no AND D.city = "Ankara"

(c)
SELECT P.proj-no, P.pname
FROM Project P
EXCEPT
SELECT P.proj-no, P.pname
FROM Project P, Works-on W, Employee E, Department D
WHERE P.proj-no = W.proj-no AND W.TCK-no = E.TCK-no AND
   E.dept-no = D.dept-no AND D.city = "Ankara"

(d)
SELECT E.TCK-no, E.ename
FROM Employee E, Works-on W, Project P, Employee E2
WHERE E.TCK-no = W.TCK-no AND W.proj-no = P.proj-no AND
     P.leader-TCK = E2.TCK-no AND E2.nationality = "USA" AND P.pbudget > 1,000,000

(e)
SELECT P.proj-no, AVE(E.salary) as avg-salary
FROM Project P, Works-on W, Employee E
WHERE P.pbudget > 1,000,000 AND P.proj-no = W.proj-no AND
   W.TCK-no = E.TCK-no AND E.birth-year > 1993
GROUP BY P.proj-no

(f)
SELECT E.dept-no
FROM Employee E
WHERE E.nationality = "Turkey" AND E.birth-year > 1993
GROUP BY E.dept-no
HAVING COUNT(*) >= 50

(g)
SELECT P.proj-no, MAX(E1.salary) as max-salary
FROM Project P, Works-on W, Employee E1, Employee E2
WHERE P.proj-no = W.proj-no AND W.TCK-no = E1.TCK-no
    AND P.leader-TCK = E2.TCK-no AND E2.nationality = "Turkey"
GROUP BY P.proj-no
HAVING COUNT(*) >= 20

(h)
WITH Temp AS (
    SELECT E.dept-no, SUM(salary) AS total-salary
    FROM Employee E
    GROUP BY E.dept-no)
SELECT T.dept-no
FROM Temp T, Department D
WHERE T.dept-no = D.dept-no AND D.budget >= 2*T.total-salary

(i)
WITH Temp AS (
    SELECT W.TCK-no, COUNT(*) AS prj-cnt
    FROM Works-on W
    GROUP BY W.TCK-no)
SELECT E.TCK-no, E.ename
FROM Employee E, Temp T
WHERE E.TCK-no = T.TCK-no AND
        T.prj-cnt = (SELECT MAX(TT.prj-cnt)
                FROM Temp TT)

(j)
WITH Temp AS (
    SELECT E.dept-no, E.TCK-no, COUNT(*) AS prj-cnt
    FROM Employee E, Works-on W
    WHERE E.TCK-no = W.TCK-no
   GROUP BY E.dept-no, E.TCK-no)
Temp2 AS (
    SELECT T.dept-no, MAX(T.prj-cnt) AS max-prj-cnt
    FROM Temp T
    GROUP BY T.dept-no)
SELECT T.dept-no, E.TCK-no, E.ename
FROM Temp T, Temp2 T2, Employee E
WHERE T.dept-no = T2.dept-no AND T.prj-cnt = T2.max-prj-cnt AND
    E.TCK-no = T.TCK-no

Q.2 [20 pts, 5 pts each]

(a) Find the id and name of the CS students together with their average grade from the courses they have taken from the MATH department.

(b) Find the id and name of the EE students who have taken more than five courses taught by CS instructors.

(c) Find the id and department of the student who either has a cgpa greater than 3.5 or who has taken a course taught by a CS instructor.

(d) Find the id and name of the students who have taken a CS course from an EE instructor, given that the course name has at least 10 characters and starts with "I".