MODERN DATABASE SYSTEM LAB 8
UNIVERSITY COURSE ENROLLMENT DATA ANAYTICS

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Question 1:

```
SELECT p.PNAME
FROM prof_data p
INNER JOIN dept_data d ON p.DNAME = d.DNAME
LEFT JOIN (SELECT DNAME, COUNT(*) AS NUM_PHD
 FROM major_data
 GROUP BY DNAME) m ON d.DNAME = m.DNAME
WHERE m.NUM_PHD < 50 OR m.NUM_PHD IS NULL;
```

OUTPUT:

```
 PNAME
Edison, L.
Smith, S.
Walter, A.
Robinson, T.
Brown, S.
Clark, E.
Randolph, B.
Bucket, T.
Jones, J.
Brian, C.
```

Question 2:

```
SELECT SNAME
FROM student_data
WHERE GPA = (SELECT MIN(GPA) FROM student_data);
```

OUTPUT:

```
SNAME
Jetplane, Leaving 0.
```

Question 3:

```
SELECT
 s.CNO AS ClassNumber,
 s.SEC_NO AS SectionNumber,
 AVG(GPA) AS AverageGPA
FROM
 section_data s INNER
JOIN
 course_data c ON s.CNO = c.CNO LEFT
JOIN
 enroll_data e ON s.CNO = e.CNO AND s.SEC_NO =
e.SEC_NO LEFT  JOIN
 student_data sd ON e.SID = sd.SID
WHERE
 c.DNAME = 'Computer Sciences'
GROUP BY
 s.CNO, s.SEC_NO
ORDER BY
 s.CNO, s.SEC_NO;
```

OUTPUT:

CLASSNUMBER	SECTIONNUMBER	AVERAGEGPA
302	1	2.9999999998
302	2	3.0749999880790675
467	1	2.980000019073485
701	1	3.283333331346508333333
726	1	2.641176480580775411764705

Question 4:

```
SELECT
 s.PNAME AS ProfessorName,
 s.SEC_NO AS SecϴonNumber FROM
 section_data s LEFT
JOIN
 enroll_data e ON s.CNO = e.CNO AND s.SEC_NO =
e.SEC_NO  GROUP BY
 s.PNAME, s.SEC_NO HAVING
 COUNT(e.SID) > 6
ORDER BY
 s.SEC_NO;
```

OUTPUT:

PROFESSORNAME SECTIONNUMBER
1 Brian, C.
1 Brown, S.
1 Bucket, T. 1
Clark, E.
1 Edison, L.
1 Jones, J.
1 Randolph, B.
1 Robinson, T.
1 Walter, A.
1 Smith, S.

Question 5:

```
SELECT s.SID, st.SNAME
FROM (
 SELECT SID, RANK() OVER (ORDER BY SecϴonCount DESC) AS rank
FROM (
 SELECT e.SID, COUNT(*) AS SecϴonCount
 FROM enroll_data e
 GROUP BY e.SID
 )
) s
JOIN student_data st ON s.SID = st.SID
WHERE s.rank = 1;
```

OUTPUT

SID	SNAME
29	Hamilton, S.

Question 6:

```
SELECT DISTINCT d.DNAME
FROM dept_data d
WHERE EXISTS (
 SELECT 1
 FROM major_data m
 JOIN student_data s ON m.SID = s.SID
 WHERE d.DNAME = m.DNAME AND s.AGE < 18);
```

OUTPUT:

industrial
Engineering

Mathematics

Question 7

```
SELECT DISTINCT s.SNAME, m.DNAME AS Major
FROM student_data s
JOIN major_data m ON s.SID = m.SID
JOIN enroll_data e ON s.SID = e.SID
JOIN secϴon_data sec ON e.CNO = sec.CNO AND e.SEC_NO =
sec.SEC_NO  JOIN course_data c ON sec.CNO = c.CNO
WHERE c.CNAME LIKE '%Geometry%';
```

OUTPUT

SNAME

Sulfate, Barry M.
Thorton, James Q.
Mathews, John W. Glitch, R. Davis,
ScoΣ P
Bates, Michael L. Cheong,
R.
Ford, Gerald
Atny, Mary H.
Ziebart, F. Uoiea,
Z.
Gooch
AusϴN, G. Zappa,
F.
Ghandi, I.
Dunbar, D.
Rosemeyer, S. Smith,
L.

MAJOR

Computer Sciences Computer Sciences
Chemical Engineering
Civil Engineering
MathemaϴcS
MathemaϴcS
Computer Sciences
Chemical Engineering
Civil Engineering
Civil Engineering
MathemaϴcS
Computer Sciences
Chemical Engineering MathemaϴcS
MathemaϴcS
Civil Engineering
Civil Engineering Computer Sciences

Question 8:

```
SELECT
 d.DNAME AS DepartmentName,
 NVL(d.NUM_PHD, 0) AS NumPhDStudents
FROM
 dept_data d
LEFT JOIN
 (
 SELECT DISTINCT m.DNAME
 FROM major_data m
 JOIN enroll_data e ON m.SID = e.SID
 JOIN secϴon_data sec ON e.CNO = sec.CNO AND e.SEC_NO =
sec.SEC_NO   JOIN course_data c ON sec.CNO = c.CNO
 WHERE c.CNAME LIKE '%Geometry%'
 ) geometry_depts
ON
 d.DNAME = geometry_depts.DNAME WHERE
 geometry_depts.DNAME IS NULL;
```

OUTPUT

```
DEPARTMENTNAME NUMPHDSTUDENTS
------------------------------ ------------------------------------------------------------
Industrial  Engineering 41
Sanitary Engineering 3
```

Question 9:

```
SELECT DISTINCT s.SNAME
FROM student_data s
WHERE s.SID IN (
 SELECT m.SID
 FROM major_data m
 JOIN enroll_data e ON m.SID = e.SID
 JOIN secϴon_data sec ON e.CNO = sec.CNO AND e.SEC_NO =
sec.SEC_NO   JOIN course_data c ON sec.CNO = c.CNO
 WHERE m.DNAME = 'Computer Sciences'
)
AND s.SID IN (
 SELECT m.SID
 FROM major_data m
 JOIN enroll_data e ON m.SID = e.SID
 JOIN secϴon_data sec ON e.CNO = sec.CNO AND e.SEC_NO =
sec.SEC_NO   JOIN course_data c ON sec.CNO = c.CNO
 WHERE m.DNAME = 'Mathematics'
);
```

OUTPUT

SNAME
---------- Pierson,
E.
Jacobs, T.

Question 10:

```
SELECT MAX(s.AGE) - MIN(s.AGE) AS
AgeDifference  FROM student_data s
WHERE s.SID IN (
 SELECT m.SID
 FROM major_data m
 WHERE m.DNAME = 'Computer
Sciences'  );
```

OUTPUT:
AGEDIFFERENCE

38

Question 11:

```
SELECT
 d.DNAME AS DepartmentName,
 AVG(s.GPA) AS AverageGPA
FROM
 dept_data d JOIN
 major_data m ON d.DNAME = m.DNAME
JOIN   student_data s ON m.SID = s.SID
WHERE
 s.GPA < 1.0
GROUP BY
 d.DNAME
HAVING
 COUNT(DISTINCT m.SID) > 0;
```

OUTPUT
DEPARTMENTNAME AVERAGEGPA
---------- ---------- Industrial
Engineering 0.350000001490116 Civil Engineering 0
Computer Sciences 0.699999988079071

Question 12:

```
SELECT s.SID, s.SNAME, s.GPA
FROM student_data s
WHERE s.SID IN (
```

```
SELECT e.SID
FROM enroll_data e
WHERE e.CNO IN (
SELECT CNO
FROM course_data
WHERE DNAME = 'Civil Engineering'
)
GROUP BY e.SID
HAVING COUNT(DISTINCT e.CNO) = (
SELECT COUNT(DISTINCT CNO)
FROM course_data
WHERE DNAME = 'Civil Engineering'
)
);
```

OUTPUT

SID	SNAME	GPA
29	Hamilton,s.	2.79999995231628