SQL HW#3 I-Wen Chou

```
SQL> start C:\DBM\SQL3\SQL_HW3.txt
SQL> SET ECHO ON
SQL> SET FEEDBACK ON
SQL> SET LINESIZE 255
SQL> SET PAGESIZE 999
SQL>
SQL> ---*Question1*---
SQL> COLUMN Employee_Name FORMAT A20
SQL> COLUMN Instructor FORMAT A20
SQL> COLUMN "List of Class" FORMAT A100
SQL> SELECT  e.Fname || ',' || e.Lname AS Employee_Name, i.Fname || ',' || i.Lname AS Instructor,
  2               LISTAGG(Crs_ID || '-' || Crs_Title || '-' ||  Sem_Cmpltd ,', ')AS "List of Class"
  3  FROM EMPLOYEE e JOIN TRAINING USING (Emp_ID)
  4                       JOIN CLASS USING (Crs_ID, Section, Sem_Cmpltd)
  5                       JOIN COURSE USING (Crs_ID)
  6                       JOIN INSTRUCTOR i USING (Instr_ID)
  7  GROUP BY e.Fname || ',' || e.Lname,  i.Fname || ',' || i.Lname
  8  HAVING COUNT(DISTINCT(Crs_ID || '-' || Crs_Title || '-' ||  Sem_Cmpltd))>1
  9  ORDER BY Employee_Name,Instructor;

EMPLOYEE_NAME       INSTRUCTOR          List of Class
------------------- ------------------- ----------------------------------------------------------------------------------------------------
--
Adam,Roditi         Carol,Jones         423 CIS-Mobile Computing-Spr 2018, 445 CIS-Hadoop and MapReduce-Spr 2022
Adam,Roditi         Chris,McCarthy      IS 540-Internet Technologies-Fall 2018, IS 700-Internet Marketing-Spr 2019
Chris,Corman        Adam,Miller         205 ACC-Corporate Finance-Fall 2019, 205 ACC-Corporate Finance-Fall 2020
Jim,Hall            Chris,McCarthy      IS 540-Internet Technologies-Fall 2018, IS 700-Internet Marketing-Spr 2019
```

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Kelly,Milton        Joe,Smith          IS 810-Big Data Analytics-Fall 2021, 20 721-Data Visualization-Spr 2022
Lisa,Swift          Joe,Smith          IS 810-Big Data Analytics-Fall 2021, 20 721-Data Visualization-Spr 2022
Mary,Krall          Peter,Chen         IS 350-Database Management-Spr 2017, IS 350-Database Management-Spr 2020
Mary,Krall          Steve,Hall         20 542-Java-Spr 2017, 20 451-Systems A. and D.-Spr 2020
Pat,Boon            Adam,Miller        201 ACC-Accounting-Spr 2018, 205 ACC-Corporate Finance-Fall 2019
Pat,Boon            Steve,Hall         211 CIS-C++-Spr 2017, 211 CIS-C++-Fall 2017
Ray,Nelson          Carol,Jones        423 CIS-Mobile Computing-Spr 2019, 425 CIS-Cloud Computing-Spr 2022
Ray,Nelson          Chris,McCarthy      IS 540-Internet Technologies-Fall 2019, IS 750-Web Applications-Spr 2021
Willam,Belli        Joe,Smith          IS 810-Big Data Analytics-Fall 2021, 20 721-Data Visualization-Spr 2022

13 rows selected.

SQL> ---*Question2*---
SQL> --"RANK"
SQL> COLUMN Sem_Cmpltd FORMAT A20
SQL> SELECT Sem_Cmpltd
  2  FROM(SELECT DENSE_RANK() OVER (ORDER BY COUNT(DISTINCT (Crs_ID || Section || Sem_Cmpltd)) DESC) AS RANK,
  3                    Sem_Cmpltd, COUNT(DISTINCT (Crs_ID || Section || Sem_Cmpltd)) AS Class_Count
  4                FROM TRAINING
  5                GROUP BY Sem_Cmpltd)
  6  WHERE RANK <= 1;

SEM_CMPLTD
--------------------
Spr 2017
Spr 2020
Spr 2022

3 rows selected.
```

```
SQL>
SQL> --"Without RANK,Rownum, and FETCH Functiton"
SQL> SELECT Sem_Cmpltd
  2  FROM TRAINING
  3  GROUP BY Sem_Cmpltd
  4  HAVING COUNT(DISTINCT (Crs_ID || Section || Sem_Cmpltd))
  5                    = (SELECT MAX(COUNT(DISTINCT (Crs_ID || Section || Sem_Cmpltd))) AS Class_Count
  6                        FROM TRAINING
  7                        GROUP BY Sem_Cmpltd);

SEM_CMPLTD
--------------------
Spr 2017
Spr 2020
Spr 2022

3 rows selected.

SQL> ---*Question3*---
SQL> COLUMN Sem_Cmpltd FORMAT A20
SQL> COLUMN Sem_Cmpltd FORMAT A20
SQL> SELECT Sem_Cmpltd, Crs_ID || ',' || Section || ',' || Sem_Cmpltd AS Class_ID, Crs_Title AS Class_Title, COUNT(Emp_ID) AS Emp_Count
  2  FROM TRAINING JOIN CLASS USING (Crs_ID, Section, Sem_Cmpltd)
  3                        JOIN COURSE USING (Crs_ID)
  4  GROUP BY Sem_Cmpltd, Crs_ID || ',' || Section || ',' || Sem_Cmpltd, Crs_Title
  5  ORDER BY regexp_replace(Sem_Cmpltd, '[^0-9]+', ''),
  6           regexp_replace(Sem_Cmpltd, '[^a-zA-Z]+', '')DESC;
```

SEM_CMPLTD	CLASS_ID	CLASS_TITLE	EMP_COUNT
Spr 2017	IS 350,B,Spr 2017	Database Management	3
Spr 2017	211 CIS,C,Spr 2017	C++	1
Spr 2017	20 542,A,Spr 2017	Java	1
Spr 2017	IS 350,A,Spr 2017	Database Management	1
Fall 2017	211 CIS,B,Fall 2017	C++	3
Spr 2018	201 ACC,A,Spr 2018	Accounting	1
Spr 2018	423 CIS,A,Spr 2018	Mobile Computing	3
Fall 2018	IS 350,A,Fall 2018	Database Management	1
Fall 2018	IS 540,B,Fall 2018	Internet Technologies	2
Spr 2019	423 CIS,A,Spr 2019	Mobile Computing	1
Spr 2019	IS 700,A,Spr 2019	Internet Marketing	5
Fall 2019	205 ACC,A,Fall 2019	Corporate Finance	2
Fall 2019	IS 540,A,Fall 2019	Internet Technologies	1
Spr 2020	IS 350,A,Spr 2020	Database Management	1
Spr 2020	20 451,A,Spr 2020	Systems A. and D.	1
Spr 2020	20 612,A,Spr 2020	Marketing	2
Spr 2020	20 325,B,Spr 2020	Social Networks	2
Fall 2020	20 325,B,Fall 2020	Social Networks	1
Fall 2020	IS 700,A,Fall 2020	Internet Marketing	3
Fall 2020	205 ACC,B,Fall 2020	Corporate Finance	1
Spr 2021	IS 750,A,Spr 2021	Web Applications	1
Spr 2021	205 ACC,A,Spr 2021	Corporate Finance	2
Fall 2021	IS 810,B,Fall 2021	Big Data Analytics	3
Spr 2022	425 CIS,A,Spr 2022	Cloud Computing	1
Spr 2022	445 CIS,A,Spr 2022	Hadoop and MapReduce	1
Spr 2022	20 721,A,Spr 2022	Data Visualization	3
Spr 2022	IS 833,B,Spr 2022	Intro to Blockchain	2

```
27 rows selected.

SQL>
SQL> ---*Question4*---
SQL> COLUMN "Employee" FORMAT 'A25'
SQL> COLUMN "Total for 2019-2021:" FORMAT '999999999999'
SQL> SELECT "Employee","2019","2020","2021","2019" + "2020" + "2021" AS "Total for 2019-2021:"
  2  FROM(SELECT Emp_ID || ':' || FNAME || ' ' || LNAME AS "Employee",
  3               TO_CHAR(regexp_replace(TRIM(Sem_Cmpltd), '[^0-9]+', ''), '9999') AS "YEAR"
  4  FROM TRAINING JOIN EMPLOYEE USING (Emp_ID)
  5  WHERE regexp_replace(TRIM(Sem_Cmpltd), '[^0-9]+', '') IN (2019,2020,2021))
  6  PIVOT (COUNT("YEAR") FOR "YEAR" IN (' 2019' AS "2019",' 2020' AS "2020",' 2021' AS "2021"))
  7  UNION
  8  SELECT 'Year Total : ',"2019","2020","2021","2019" + "2020" + "2021" AS "Total for 2019-2021:"
  9  FROM(SELECT TO_CHAR(regexp_replace(TRIM(Sem_Cmpltd), '[^0-9]+', ''), '9999') AS "YEAR"
 10  FROM TRAINING JOIN EMPLOYEE USING (Emp_ID)
 11  WHERE regexp_replace(TRIM(Sem_Cmpltd), '[^0-9]+', '') IN (2019,2020,2021))
 12  PIVOT (COUNT("YEAR") FOR "YEAR" IN (' 2019' AS "2019",' 2020' AS "2020",' 2021' AS "2021"))
 13  ORDER BY "Employee";
```

```
Employee                      2019       2020       2021 Total for 2019-2021:
------------------------ ---------- ---------- ---------- --------------------
100:Mary Krall                   1          2          0                    3
128:Pat Boon                     2          0          0                    2
137:Jim Hall                     1          1          0                    2
153:Adam Roditi                  1          0          0                    1
162:Ray Nelson                   2          1          1                    4
168:Chris Corman                 2          2          0                    4
171:Willam Belli                 0          2          1                    3
172:Lisa Swift                   0          2          1                    3
173:Kelly Milton                 0          1          1                    2
314:Bob Gates                    0          0          1                    1
315:Howard Wheeler               0          0          1                    1
Year Total :                     9         11          6                   26

12 rows selected.




SQL>
SQL> ---*Question5*---
SQL> COLUMN Crs_ID FORMAT A20
SQL> SELECT Crs_ID,Crs_Title, COUNT(DISTINCT Emp_ID) AS Emp_Count,
  2                RANK() OVER (ORDER BY COUNT(DISTINCT Emp_ID) DESC) AS RANK
  3  FROM COURSE LEFT JOIN CLASS USING (Crs_ID)
  4                   LEFT JOIN TRAINING USING (Crs_ID, Section, Sem_Cmpltd)
  5  GROUP BY Crs_ID,Crs_Title;
```

```
CRS_ID              CRS_TITLE                EMP_COUNT       RANK
------------------- ------------------------ ---------- ----------
IS 700              Internet Marketing                8          1
IS 350              Database Management               4          2
423 CIS             Mobile Computing                  4          2
205 ACC             Corporate Finance                 4          2
20 325              Social Networks                   3          5
IS 540              Internet Technologies             3          5
211 CIS             C++                               3          5
IS 810              Big Data Analytics                3          5
20 721              Data Visualization                3          5
20 612              Marketing                         2         10
IS 833              Intro to Blockchain               2         10
IS 750              Web Applications                  1         12
201 ACC             Accounting                        1         12
20 542              Java                              1         12
445 CIS             Hadoop and MapReduce              1         12
425 CIS             Cloud Computing                   1         12
20 451              Systems A. and D.                 1         12
302 CIS             Database Management               0         18
IS 800              Text Analytics                    0         18

19 rows selected.

SQL>
SQL> ---*Question6*---
SQL> COLUMN "YEAR" FORMAT 'A20'
SQL> SELECT "YEAR",TO_CHAR(Tuition_Year, '$99999999,990') AS "Total_Tuition",
  2           TO_CHAR(AVG(Tuition_Year) OVER(ORDER BY "YEAR" ROWS BETWEEN 1 PRECEDING
```

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  3                         AND 1 FOLLOWING),'$999,990') "MA(3)"
  4  FROM(SELECT regexp_replace(Sem_Cmpltd, '[^0-9]+', '') AS "YEAR", SUM(Tuition) AS Tuition_Year
  5  FROM TRAINING JOIN COURSE USING (Crs_ID)
  6  GROUP BY regexp_replace(Sem_Cmpltd, '[^0-9]+', '')
  7  ORDER BY "YEAR");

YEAR                Total_Tuition  MA(3)
------------------- -------------- ---------
2017                       $24,000   $21,500
2018                       $19,000   $22,833
2019                       $25,500   $23,667
2020                       $26,500   $23,000
2021                       $17,000   $21,417
2022                       $20,750   $18,875

6 rows selected.

SQL>
SQL> ---*Question7*---
SQL> COLUMN Total_Spent FORMAT $999,990
SQL> SELECT Emp_ID,Class_Count,Total_Spent
  2  FROM(SELECT RANK() OVER (ORDER BY SUM(Tuition) DESC) AS RANK,
  3  Emp_ID, COUNT(Crs_ID) AS Class_Count, SUM(Tuition) AS Total_Spent
  4  FROM TRAINING JOIN COURSE USING (Crs_ID)
  5  JOIN EMPLOYEE USING (Emp_ID)
  6  GROUP BY Emp_ID)
  7  WHERE RANK <= 2;
```

```
    EMP_ID CLASS_COUNT TOTAL_SPENT
---------- ----------- -----------
       128           7     $19,000
       153           6     $16,500

2 rows selected.

SQL> spool off
```