MA611 – 2nd Semester MCA, 2024-2025
DATABASE SYSTEMS LAB
Assignment-3

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1. List all students with a total credit count of 0.

```
SQL> select * from student where tot_cred = 0;

ID    NAME                 DEPT_NAME            TOT_CRED
----- -------------------- -------------------- ----------
4582  Zaniolo              Math                          0
93571 Kato                 Psychology                    0
81610 Ching                Languages                     0
81175 Zelek                Biology                       0
59908 Cox                  Civil Eng.                    0
48053 Macias               Comp. Sci.                    0
82646 Nirenbu              Biology                       0
39157 Loull                Accounting                    0
14032 Belhadji             Elec. Eng.                    0
83204 Tauber               Accounting                    0
11201 Bianchi              Statistics                    0

ID    NAME                 DEPT_NAME            TOT_CRED
----- -------------------- -------------------- ----------
70924 Rajnov               Civil Eng.                    0
987   Kasani               Athletics                     0
42625 Holland              Languages                     0
82707 Hadzilacos           Statistics                    0
15283 Williams             Astronomy                     0
75252 Huo                  Languages                     0
63289 So                   Psychology                    0
92776 Oki                  Psychology                    0
57055 Piou                 Physics                       0

20 rows selected.
```

2. Find the names of all courses offered by the "Physics" department.

```
SQL> select title from course where dept_name='Physics';

TITLE
------------------------------------------------
Mobile Computing
Cost Accounting
Bacteriology
Hydraulics
Stream Processing
The Music of Donovan
Differential Geometry
The Music of the Ramones
The Music of Dave Edmunds
Journalism

10 rows selected.
```

3. Retrieve the names of all instructors who earn exactly ₹50,000.

```
SQL> select * from instructor where salary=50000;

ID    NAME                 DEPT_NAME                SALARY
----- -------------------- -------------------- ----------
48570 Sarkar               Pol. Sci.                 50000
```

4. List all classrooms with a capacity of exactly 100.

```
SQL> select * from classroom where capacity=100;

BUILDING        ROOM_NU   CAPACITY
--------------- ------- ----------
Painter         86           100
Lambeau         348          100
```

5. Find the total number of courses offered in the "Spring" semester.

```
SQL> select count(distinct course_id) from section where semester='Spring';

COUNT(DISTINCTCOURSE_ID)
------------------------
                     45
```

6. List all students who have taken exactly 30 total credits.

```
SQL> select * from student where tot_cred=30;

ID    NAME                 DEPT_NAME                TOT_CRED
----- -------------------- -------------------- ----------
38899 Murphy               Marketing                    30
36845 Okaf                 Math                         30
81638 Chiu                 Statistics                   30
28952 Kennedy              Accounting                   30
61127 Tuki                 Physics                      30
53805 Ludwig               Cybernetics                  30
76291 Dellwo               Physics                      30
7390  Stone                Accounting                   30
5925  Maw                  Languages                    30
72177 Eller                Mech. Eng.                   30
68712 Hill                 Civil Eng.                   30

ID    NAME                 DEPT_NAME                TOT_CRED
----- -------------------- -------------------- ----------
52866 Loull                Math                         30
5381  Diana                Languages                    30
83003 Nam                  Psychology                   30

14 rows selected.
```

7. Find the names of all courses offered by the "Psychology" department.

```
SQL> select title from course where dept_name='Psychology';

TITLE
-------------------------------------------------
Greek Tragedy
Graph Theory
Visual BASIC
FOCAL Programming
Transaction Processing
Geology
Operating Systems
Mechanics
Environmental Law
Compiler Design
Animal Behavior

TITLE
-------------------------------------------------
Video Gaming
Geology

13 rows selected.
```

8. Retrieve the names of all instructors who earn more than ₹100,000.

```
SQL> select name, salary from instructor where salary > 100000;

NAME                      SALARY
-------------------- ----------
Mird                   119921.41
Shuming                108011.81
Voronina               121141.99
Arias                  104563.38
Mingoz                 105311.38
Kenje                  106554.73
Jaekel                 103146.87
Bondi                  115469.11
Lent                   107978.47
Sakurai                118143.98
Bietzk                  117836.5

NAME                      SALARY
-------------------- ----------
Wieland                124651.41

12 rows selected.
```

9. List all classrooms located in the "Taylor" building.

```
SQL> select * from classroom where building='Taylor';

BUILDING          ROOM_NU    CAPACITY
--------------    -------    ----------
Taylor            183              71
Taylor            812             115
```

10. Find the total number of courses offered in the "Fall" semester.

```
SQL> select count(distinct course_id) from section where semester='Fall';

COUNT(DISTINCTCOURSE_ID)
------------------------
                      46
```

11. List all students who have taken courses with a grade of "C" or lower.

```
SQL> select student.id, student.name, takes.grade from student join takes on student.id = takes.id where
grade >= 'C' and rownum <= 15;

ID    NAME                 GR
----- ------------------- --
65901 Shishkin            C-
94836 Fuller              C+
48850 Wehen               C-
53469 Fujii               C
49073 Bonvin              C-
88993 Palaniswami         C+
33460 Leonard             C+
8957  Walker              C
7956  Brandsd             C
92659 Mathias             C
46769 Kivv                C-

ID    NAME                 GR
----- ------------------- --
70235 Zle                 C
39619 Dwyer               C+
33651 Seike               C-
62520 Im                  C-

15 rows selected.
```

12. Retrieve the names of instructors who have taught in the "Fall" semester of 2022.

```
SQL> select distinct instructor.name from instructor join teaches on instructor.id = teaches.id where tea
ches.semester = 'Fall' and teaches.year = 2002;

NAME
-------------------
Liley
Queiroz
Sullivan
Ullman
Bondi
Choll
Gustafsson
Romero
Dale

9 rows selected.
```

13. Find the average capacity of classrooms in each building.

```
SQL> select building, avg(capacity) average_capacity from classroom group by building;

BUILDING        AVERAGE_CAPACITY
--------------  ----------------
Painter                      100
Stabler                      113
Nassau                        92
Chandler                    10.5
Whitman                       76
Alumni                      36.5
Main                          26
Power                         11
Garfield                      59
Taylor                        93
Saucon                 49.3333333

BUILDING        AVERAGE_CAPACITY
--------------  ----------------
Gates                       37.5
Fairchild                     27
Polya                         28
Grace                         34
Bronfman                      12
Lambeau                      100
Lamberton                     10
Drown                         18
Rathbone                      60

20 rows selected.
```

14. List all courses that have more than 3 credits.

```
SQL> select * from course where credits > 3 and rownum <= 15;

COURSE_I TITLE                                           DEPT_NAME              CREDITS
-------- ----------------------------------------------- ---------------------- ----------
787      C  Programming                                  Mech. Eng.                   4
278      Greek Tragedy                                   Statistics                   4
972      Greek Tragedy                                   Psychology                   4
400      Visual BASIC                                    Psychology                   4
762      The Monkeys                                     History                      4
482      FOCAL Programming                               Psychology                   4
581      Calculus                                        Pol. Sci.                    4
843      Environmental Law                               Math                         4
704      Marine Mammals                                  Geology                      4
774      Game Programming                                Cybernetics                  4
591      Shakespeare                                     Pol. Sci.                    4

COURSE_I TITLE                                           DEPT_NAME              CREDITS
-------- ----------------------------------------------- ---------------------- ----------
319      World History                                   Finance                      4
274      Corporate Law                                   Comp. Sci.                   4
852      World History                                   Athletics                    4
808      Organic Chemistry                               English                      4

15 rows selected.
```

15. Retrieve the names of students who have taken courses in the "Watson" *("Taylor")* building.

```
SQL> select * from (select distinct student.name from student join takes on student.id = takes.id join se
ction on takes.sec_id = section.sec_id and section.course_id = takes.course_id and section.year = takes.y
ear where section.building = 'Taylor') where rownum <= 15;

NAME
-------------------
Aarde
Abdul-Rahman
Abeggl
Abraham
Abu-B
Achilles
Adam
Adda
Adeni
Advani
Afim

NAME
-------------------
Agar
Agarwal
Agraz
Ahmad

15 rows selected.
```

16. Find the total number of students advised by each instructor.

```
SQL> select i_id, count(s_id) from advisor group by i_id;

I_ID  COUNT(S_ID)
----- -----------
99052          33
52647          48
79653          46
63395          31
95030          41
59795          31
81991          40
65931          38
22591          40
73623          46
48570          49

I_ID  COUNT(S_ID)
----- -----------
41930          41
28400          44
14365          39
35579          54
43779          34
77346          54
90643          24
25946          38
79081          40
80759          43
4233           44
```

17. List all sections that do not have a classroom assigned.

```
SQL> select * from section where room_number is null;

no rows selected
```

18. Retrieve the names of students who have taken courses with the highest number of credits.

```
SQL> select distinct student.id, name from student join takes on student.id = takes.id where takes.course
_id in (select course_id from course where credits in (select max(credits) from course));

ID    NAME
----- -------------------
7956  Brandsd
10033 Zelty
10076 Duan
10481 Grosch
35498 Lanfr
35588 John
35685 Usi
90372 Rho
29390 Aufr
29399 Sutter
29514 Michael

ID    NAME
----- -------------------
29645 Oller
15328 Chien
15340 Silbert
15538 Yeung
6400  Kelly
20180 Reyes
20974 Hawkins
68263 Roessler
68453 Kjellmer
44816 Burman
31761 Jame

ID    NAME
----- -------------------
32065 Tapia
32130 Bannac
32245 Saariluoma
32345 Chormo
74530 Ranno
```

19. Find the departments with the highest average instructor salary.

```
SQL> select * from (select dept_name, avg(salary) avg_salary from instructor group by dept_name order by
avg_salary desc) where rownum <= 1;

DEPT_NAME              AVG_SALARY
------------------- ----------
Physics                 114576.9
```

20. List all courses that have been taught by more than one instructor.

```
SQL> select course_id from teaches group by course_id having count(distinct id) > 1;

COURSE_I
--------
867
158
200
960
468
```

21. List all students who have taken courses with a grade of "A" in the "Fall" semester of 2022 *(2002)*.

```
SQL> select * from student join takes on student.id = takes.id where takes.grade like 'A%' and takes.seme
ster='Fall' and takes.year = 2002;

ID     NAME                 DEPT_NAME            TOT_CRED ID     COURSE_I SEC_ID  SEMEST      YEAR GR
-----  -------------------- -------------------- ---------- -----  -------- -------- ------ ---------- --
14182  Moszkowski           Civil Eng.                  73 14182  694      1       Fall        2002 A+
79329  Velikovs             Marketing                  110 79329  200      2       Fall        2002 A-
98940  Hawthorne            Marketing                   78 98940  169      2       Fall        2002 A+
21395  Leuen                Math                        43 21395  169      2       Fall        2002 A-
94998  Krishnakumar         Physics                     81 94998  192      1       Fall        2002 A-
1968   Sahm                 Finance                      4 1968   694      1       Fall        2002 A
81538  Wunderli             Languages                  117 81538  274      1       Fall        2002 A
68999  Greve                Psychology                 113 68999  192      1       Fall        2002 A-
74639  Cerime               Accounting                  35 74639  169      2       Fall        2002 A
66054  Crick                Comp. Sci.                  86 66054  192      1       Fall        2002 A
60267  Dage                 Physics                      7 60267  274      1       Fall        2002 A+

ID     NAME                 DEPT_NAME            TOT_CRED ID     COURSE_I SEC_ID  SEMEST      YEAR GR
-----  -------------------- -------------------- ---------- -----  -------- -------- ------ ---------- --
17769  Pearlman             Biology                     45 17769  192      1       Fall        2002 A-
17769  Pearlman             Biology                     45 17769  274      1       Fall        2002 A
39580  Macias               Psychology                 128 39580  192      1       Fall        2002 A+
39580  Macias               Psychology                 128 39580  461      1       Fall        2002 A
89106  Dawson               Mech. Eng.                  88 89106  559      1       Fall        2002 A+
60040  Samel                Math                       100 60040  105      2       Fall        2002 A
7123   Holn                 Math                        27 7123   559      1       Fall        2002 A-
44584  Agar                 Geology                     58 44584  559      1       Fall        2002 A
76953  Lemoine              Athletics                   60 76953  169      2       Fall        2002 A+
76953  Lemoine              Athletics                   60 76953  694      1       Fall        2002 A-
22057  Cal                  Cybernetics                 20 22057  461      1       Fall        2002 A-
```

22. Retrieve the names of instructors who have taught in the "Spring" semester of 2023.

```
SQL> select distinct instructor.name from instructor join teaches on instructor.id = teaches.id where tea
ches.semester = 'Spring' and teaches.year = 2003;

NAME
--------------------
Ullman
DAgostino
Mahmoud
Mingoz
Dale
```

23. Find the average number of students enrolled in each course.

```
SQL> select avg(cnt) from (select count(id) cnt from takes group by course_id);

  AVG(CNT)
----------
352.941176
```

24. List all courses that have exactly 4 credits.

```
SQL> select * from course where credits = 4;

COURSE_I TITLE                                     DEPT_NAME              CREDITS
-------- ---------------------------------------- ---------------------- ----------
787      C  Programming                           Mech. Eng.                    4
278      Greek Tragedy                            Statistics                    4
972      Greek Tragedy                            Psychology                    4
400      Visual BASIC                             Psychology                    4
762      The Monkeys                              History                       4
482      FOCAL Programming                        Psychology                    4
581      Calculus                                 Pol. Sci.                     4
843      Environmental Law                        Math                          4
704      Marine Mammals                           Geology                       4
774      Game Programming                         Cybernetics                   4
591      Shakespeare                              Pol. Sci.                     4

COURSE_I TITLE                                     DEPT_NAME              CREDITS
-------- ---------------------------------------- ---------------------- ----------
319      World History                            Finance                       4
274      Corporate Law                            Comp. Sci.                    4
852      World History                            Athletics                     4
808      Organic Chemistry                        English                       4
730      Quantum Mechanics                        Elec. Eng.                    4
362      Embedded Systems                         Finance                       4
227      Elastic Structures                       Languages                     4
376      Cost Accounting                          Physics                       4
489      Journalism                               Astronomy                     4
407      Industrial Organization                  Languages                     4
998      Immunology                               Civil Eng.                    4
```

25. Retrieve the names of students who have taken courses in the "Packard" *("Whitman")* building.

```
SQL> select distinct student.id, student.name from student join takes on student.id = takes.id join secti
on on takes.course_id = section.course_id and takes.sec_id = section.sec_id and section.building='Whitman
';

ID     NAME
----- -------------------
92839 Cirsto
21395 Leuen
90567 Tomason
57985 Weller
33651 Seike
58889 Collet
70572 Andrews
77289 Kok
19582 Canas
2419  Hirakuri
18808 Snif

ID     NAME
----- -------------------
91063 Dair
62549 Komatsu
32245 Saariluoma
17831 Srivastava
28738 Birkett
3651  Narayanan
69960 Raïev
36494 Baccou
79446 Frost
1087  Roses
46769 Kivv
```

26. Find the total number of sections taught by each instructor.

```
SQL> select distinct instructor.name,  count(*) from instructor join teaches on instructor.i
d join section on teaches.course_id = section.course_id group by instructor.name;

NAME                    COUNT(*)
-------------------- ----------
Liley                          1
Morris                         5
Tung                           3
Shuming                        2
Wieland                        3
Ullman                         9
Bondi                          3
Queiroz                        1
Lent                           1
Luo                            1
Sullivan                       1

NAME                    COUNT(*)
-------------------- ----------
Vicentino                      1
Sarkar                         2
Gustafsson                     6
Choll                          1
Atanassov                      2
Bietzk                         2
DAgostino                     18
Bawa                           1
Sakurai                        6
Mahmoud                        8
Bourrier                       3
```

27. List all sections that are held in rooms with a capacity of less than 50.

```
SQL> select section.sec_id, section.semester, section.year, section.building, section.room_number, sectio
n.time_slot_id from section join classroom on section.building = classroom.building where classroom.capac
ity > 50;

SEC_ID  SEMEST     YEAR BUILDING         ROOM_NU TIME
------- ------ ---------- --------------- ------- ----
1       Spring     2004 Gates            314     K
1       Spring     2010 Whitman          434     O
1       Spring     2001 Saucon           844     D
1       Fall       2006 Taylor           183     C
1       Fall       2006 Taylor           183     C
1       Spring     2003 Saucon           113     J
1       Fall       2008 Whitman          434     F
1       Fall       2002 Saucon           180     F
1       Spring     2010 Taylor           183     I
1       Spring     2010 Taylor           183     I
1       Fall       2006 Taylor           183     E

SEC_ID  SEMEST     YEAR BUILDING         ROOM_NU TIME
------- ------ ---------- --------------- ------- ----
1       Fall       2006 Taylor           183     E
1       Fall       2006 Saucon           180     M
1       Spring     2001 Saucon           113     O
1       Spring     2007 Taylor           183     E
1       Spring     2007 Taylor           183     E
1       Fall       2009 Taylor           812     O
1       Fall       2009 Taylor           812     O
1       Fall       2005 Saucon           844     O
1       Fall       2001 Saucon           180     P
1       Fall       2009 Whitman          134     K
1       Spring     2009 Taylor           183     J
```