DATABASE MANAGEMENT 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.id = teaches.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
```