SQL Labsheet 7

DINESH KUMAR

225229108

NoSQL Database Management Lab
Lab7: University Course Enrollment Data Analytics

Write SQL queries for the following problems

Question1. Print the names of professors who work in departments that have fewer than 50 PhD students.

SQL> select a.pname,b.dname,num_phd from prof a,dept b where num_phd<50;

PNAME	DNAME	NUM_PHD
Jones, J.	Computer Sciences	47
Smith, S.	Computer Sciences	47
Brown, S.	Computer Sciences	47
Brian, C.	Computer Sciences	47
Edison, L.	Computer Sciences	47
Bucket, T.	Computer Sciences	47
Robinson, T.	Computer Sciences	47
Clark, E.	Computer Sciences	47
Walter, A.	Computer Sciences	47
Randolph, B.	Computer Sciences	47
Jones, J.	Chemical Engineering	32
Smith, S.	Chemical Engineering	32
Brown, S.	Chemical Engineering	32
Brian, C.	Chemical Engineering	32
Edison, L.	Chemical Engineering	32
Bucket, T.	Chemical Engineering	32
Robinson, T.	Chemical Engineering	32
Clark, E.	Chemical Engineering	32
Walter, A.	Chemical Engineering	32
Randolph, B.	Chemical Engineering	32
Jones, J.	Industrial Engineering	41
Smith, S.	Industrial Engineering	41
Brown, S.	Industrial Engineering	41
Brian, C.	Industrial Engineering	41
Edison, L.	Industrial Engineering	41
Bucket, T.	Industrial Engineering	41

Robinson, T. Industrial Engineering 41
Clark, E. Industrial Engineering 41
Walter, A. Industrial Engineering 41
Randolph, B. Industrial Engineering 41
Jones, J. Sanitary Engineering 3
Smith, S. Sanitary Engineering 3
Brown, S. Sanitary Engineering 3
Brian, C. Sanitary Engineering 3
Edison, L. Sanitary Engineering 3
Bucket, T. Sanitary Engineering 3
Robinson, T. Sanitary Engineering 3
Clark, E. Sanitary Engineering 3
Walter, A. Sanitary Engineering 3
Randolph, B. Sanitary Engineering 3

40 rows selected.

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Question 2. Print the names of the students with the lowest GPA.
SQL> select sname,gpa from student where gpa=(select min(gpa) from student);

SNAME	GPA
Jetplane, Leaving O.	0

Question3. For each Computer Sciences class, print the class number, section number, and the average gpa of the students enrolled in the class section.

SQL> select a.cno,sec_no,avg(b.gpa) from enr oll a,student b where dname='Computer
Sciences' and a.sid=b.sid group by dname,cno,sec_no;

CNO	SEC_NO	AVG(B.GPA)
302	1	3
726	1	2.64117648
467	1	2.98000002
302	2	3.07499999
701	1	3.28333333

Question4. Print the names and section numbers of all sections with more than six students enrolled in them.

SQL> select a.cno,cname,b.sec_no,count(b.sid) from course a left join enroll b on a.cno=b.cno group by a.cno,cname,b.sec_no having count(b.sid)>6;

CNO	CNAME	SEC_NO	COUNT(B.SID)
302	Intro to Programming 2	8	
467	Intro to Data Structures	1	10
310	Intro to Garbage	1	7
462	College Geometry	1	9
701	Compiler Construction	1	12
561	Advanced City Planning	1	13
514	Manpower Utilization 1	9	
561	Adv Garbage Collection	1	13
365	City Planning	1	8
375	Highway Engineering 1	9	
310	Thermodynamics	1	7
302	Intro to Programming 1	10	
461	College Geometry 1	1	9
726	Nonlinear Programming1	1	7

14 rows selected.

Question5. Print the name(s) and sid(s) of the student(s) enrolled in the most sections.

SQL> select sname,sid from student where sid in (select sid from enroll group by sid having count(*)>=all(select count(*) from enroll group by sid));

SNAME	SID
Hamilton, S.	29

Question6. Print the names of departments that have one or more majors who are under 18 year old.

SQL> select s.sid,m.dname from student s, major m where s.sid=m.sid and s.age<18;

SID	DNAME
82	Industrial Engineering
90	Mathematics

Question7. Print the names and majors of students who are taking one of the College Geometr courses.

SQL> select e.sid,m.sid, m.dname from enroll e inner join major m on e.sid=m.sid where e.cno in (461,462);

SID	SID	DNAME
4	4	Computer Sciences
14	14	Computer Sciences
17	17	Computer Sciences
18	18	Computer Sciences
19	19	Computer Sciences
26	26	Chemical Engineering
28	28	Chemical Engineering
35	35	Chemical Engineering
37	37	Civil Engineering
40	40	Civil Engineering
53	53	Civil Engineering
55	55	Civil Engineering
59	59	Civil Engineering
90	90	Mathematics
91	91	Mathematics
94	94	Mathematics
101	101	Mathematics
102	102	Mathematics

18 rows selected.

Question8. For those departments that have no major taking a College Geometry course print the department name and the number of PhD students in the department.

SQL> select dname,num_phd from dept where not exists(select 1 from course where course.dname=dept.dname and course.cname like '%collegegeometry%');

DNAME	NUM_PHD
Industrial Engineering	41
Chemical Engineering	32
Mathematics	129
Computer Sciences	47
Sanitary Engineering	3
Civil Engineering	88

6 rows selected.

Question9. Print the names of students who are taking both a Computer Sciences course and a Mathematics course.

SQL> select s.sid,s.sname from student s inner join enroll e on s.sid=e.sid where e.dname='Computer Sciences' and e.dname='Mathematics';
no rows selected

Question10. Print the age difference between the oldest and the youngest Computer Sciences major

SQL> select max(s.age)-min(s.age) as age_difference from student s inner join major m on m.sid=s.sid where m.dname='Computer Sciences';

AGE_DIFFERENCE

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Question11. For each department that has one or more majors with a GPA under 1.0, print the name of the department and the average GPA of its majors.

SQL> select s.sid,avg(gpa),e.dname from student s, enroll e where gpa<1 group by s.sid,e.dname;

SID	AVG(GPA)	DNAME
65	.5	Chemical Engineering
65	.5	Civil Engineering
51	0	Mathematics
65	.5	Computer Sciences
65	.5	Sanitary Engineering
80	.200000003	Computer Sciences
80	.200000003	Mathematics
80	.200000003	Industrial Engineering
19	.699999988	Computer Sciences
51	0	Chemical Engineering
80	.200000003	Chemical Engineering
51	0	Industrial Engineering
80	.200000003	Civil Engineering
19	.699999988	Chemical Engineering
65	.5	Industrial Engineering
80	.200000003	Sanitary Engineering
19	.699999988	Industrial Engineering

51	0	Sanitary Engineering
65	.5	Mathematics
19	.699999988	Civil Engineering
19	.699999988	Mathematics
19	.699999988	Sanitary Engineering
51	0	Computer Sciences
51	0	Civil Engineering

24 rows selected.

Question12. Print the ids, names and GPAs of the students who are currently taking all the Civil Engineering courses.

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select e.sid,s.sname, gpa from student s right outer join enroll e on s.sid=e.sid
where e.dname='Civil Engineering' group by e.sid,s.sname,gpa order by gpa;
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SID	SNAME	GPA
81	Smith, Ike Z.	1.10000002
18	Gooch	1.39999998
47	Roger, Blotter N.	1.89999998
9	Smith, Joyce A.	2
61	Kennedy, Ed	2.29999995
34	Kasten, Norman L.	2.5
60	Calcmity, J.	2.5999999
66	Altenhaus, Stuart	2.79999995
29	Hamilton, S.	2.79999995
36	Burroughs, Susan S	3
70	Caucutt, B.	3
54	Maximillian	3
76	Zorhoff, C.	3
23	Bomber, C.	3.20000005
96	Birch, M.	3.5
85	Mayer, N.	3.5
33	Chao, Tsechih	3.5999999
74	Andrus, J.	3.70000005
79	Evert, Chris	3.9000001
32	Liu, Huihusan	3.9000001
3	Zeene, Ben N.	3.9000001
64	Fred, Edwin B.	4
48	Natividad, A.	4
73	Quarnty, G.	4\

24 rows selected.