Lab-7

ROLLNO : 225229104

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.

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 enroll 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 |
| CNO |
| ---------- |
| CNAME |
| -------------------------------------------------------------------------------- |
| SEC\_NO COUNT(B.SID) |
| ---------- ------------ |
| 310 |
| Intro to Garbage |
| 1 7 |
| 462 |
| College Geometry 2 |
| CNO |
| ---------- |
| CNAME |
| -------------------------------------------------------------------------------- |
| SEC\_NO COUNT(B.SID) |
| ---------- ------------ |
| 1 9 |
| 701 |
| Compiler Construction |
| 1 12 |
| 561 |
| CNO |
| ---------- |
| CNAME |
| -------------------------------------------------------------------------------- |
| SEC\_NO COUNT(B.SID) |
| ---------- ------------ |
| Advanced City Planning |
| 1 13 |
| 514 |
| Manpower Utilization |
| 1 9 |
| CNO |
| ---------- |
| CNAME |
| -------------------------------------------------------------------------------- |
| SEC\_NO COUNT(B.SID) |
| ---------- ------------ |
| 561 |
| Advanced Garbage Collection |
| 1 13 |
| 365 |
| City Planning |
| 1 8 |
| CNO |
| ---------- |
| CNAME |
| -------------------------------------------------------------------------------- |
| SEC\_NO COUNT(B.SID) |
| ---------- ------------ |
| 375 |
| Highway Engineering |
| 1 9 |
| 310 |
| Thermodynamics |
| CNO |
| ---------- |
| CNAME |
| -------------------------------------------------------------------------------- |
| SEC\_NO COUNT(B.SID) |
| ---------- ------------ |
| 1 7 |
| 302 |
| Intro to Programming |
| 1 10 |
| 461 |
| CNO |
| ---------- |
| CNAME |
| -------------------------------------------------------------------------------- |
| SEC\_NO COUNT(B.SID) |
| ---------- ------------ |
| College Geometry 1 |
| 1 9 |
| 726 |
| Nonlinear Programming |
| 1 17 |
| 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 |
| -------------- |
| 38 |

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.

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;

|  |
| --- |
| 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. |