

Nathan Donaldson
U0632803
CS5530
HW3

PROBLEM 1

1)

MySQL [cs5530db]> select max(age) from student;

```
+-----+
| max(age) |
+-----+
|    99    |
+-----+
```

1 row in set (0.00 sec)

2)

MySQL [cs5530db]> select s.sname, s.gpa from student s, enroll r where s.sid = r.sid and r.cno = 302;

```
+-----+-----+
| sname      | gpa |
+-----+-----+
| Pierson, E. | 3.5 |
| Scott, Kim J. | 3.8 |
| Sather, Roberto B. | 2.2 |
| Stanley, Leotha T. | 3.6 |
| Jones, David S. | 3.5 |
| Paul, Mary W. | 3.6 |
| Soong, V. | 3.5 |
| Kellerman, S. | 2.9 |
| Korpel, E. | 3.5 |
| Emile, R. | 2 |
| Carter, Jimmy | 3.5 |
| Kissinger, Henry | 3.4 |
| Andrews, R. | 2.8 |
| Auen, B. | 2.7 |
| Shoemaker, A. | 3.5 |
| Fy, Clara I. | 2 |
| Heilskov, G. | 2.5 |
| Baskett, Wayse T. | 2.1 |
+-----+-----+
```

18 rows in set (0.00 sec)

3)

MySQL [cs5530db]> select distinct s.sname, m.dname from student s, major m, enroll e, (select cno from course where cname like "%Advanced%") as meow where s.sid = m.sid and meow.cno = e.cno and s.sid = e.sid;

sname	dname
Bomber, C.	Computer Sciences
Hamilton, S.	Chemical Engineering
Liu, Huihusan	Chemical Engineering
Kasten, Norman L.	Chemical Engineering
Roger, Blotter N.	Civil Engineering
Natividad, A.	Civil Engineering
Calcmity, J.	Civil Engineering
Kennedy, Ed	Civil Engineering
Fred, Edwin B.	Industrial Engineering
Caucutt, B.	Industrial Engineering
Smith, Ike Z.	Industrial Engineering
Birch, M.	Mathematics

12 rows in set (0.00 sec)

4)

MySQL [cs5530db]> select distinct s.sname from student s, (select distinct sid from enroll where dname = "Computer Sciences") as CS, (select distinct sid from enroll where dname = "Mathematics") as MA where CS.sid = MA.sid and s.sid = MA.sid and s.sid = CS.sid;

sname
Zappa, F.

1 row in set (0.01 sec)

5)

MySQL [cs5530db]> select d.dname, avg(s.gpa) as average_gpa, (max(s.gpa)-min(s.gpa)) as diff
from dept d, (select s.gpa, m.dname from student s, major m where s.sid = m.sid) as s where
s.dname = d.dname group by d.dname;

dname	average_gpa	diff
Chemical Engineering	3.2999999956651167	1.4000000953674316
Civil Engineering	2.9142857236521587	4
Computer Sciences	3.0041666651765504	3.2000001072883606
Industrial Engineering	2.7699999906122685	3.7999999970197678
Mathematics	3.2421052644127295	2.899999976158142
Sanitary Engineering	2.799999952316284	0

6 rows in set (0.00 sec)

6)

MySQL [cs5530db]> select count(*) as students_with_one_major from (select sid from major
group by sid having count(*) = 1) s;

students_with_one_major
96

1 row in set (0.00 sec)

7)

MySQL [cs5530db]> select s.sname from student s, (select s.sid from (select s.sid, count(s.cno)
as count from (select distinct sid, cno from enroll) as s group by sid) as s where s.count = (select
min(s.count))) as meow where meow.sid = s.sid;

sname
Jacobs, T.
Pierson, E.
Zeene, Ben N.
Sulfate, Barry M.
Form, Clara O.
Scott, Kim J.
Sather, Roberto B.
Stanley, Leotha T.
Smith, Joyce A.

| Jones, David S. |
| Paul, Mary W. |
| Soong, V. |
| Kellerman, S. |
| Cheong, R. |
| Borchart, Sandra L. |
| Alsberg, David J. |
| Thorton, James Q. |
| Gooch |
| Smith, L. |
| Korpel, E. |
| Surk, K. |
| Emile, R. |
| Bomber, C. |
| Carter, Jimmy |
| Kissinger, Henry |
| Ford, Gerald |
| Anderson, P. |
| Austin, G. |
| Hamilton, S. |
| Baker, C. |
| Andrews, R. |
| Liu, Huihusan |
| Chao, Tsechih |
| Kasten, Norman L. |
| Mathews, John W. |
| Burroughs, Susan S. |
| Dunbar, D. |
| Auen, B. |
| Shoemaker, A. |
| Rosemeyer, S. |
| Fisher, C. |
| Trude, T. |
| Ksar, J. |
| Moeri, S. |
| June, Granson |
| Micheal, Zadicki T. |
| Roger, Blotter N. |
| Natividad, A. |
| Villa-lobos, M. |
| Moomchi, B. |
| Jetplane, Leaving O. |
| Fy, Clara I. |
| Atny, Mary H. |

| Maximillian |
| Glitch, R. |
| Starry, J. |
| Hiemerschmitz, A. |
| Marshmallton |
| Ziebart, F. |
| Calcmity, J. |
| Kennedy, Ed |
| Moses, A. |
| Kool, Joseph F. |
| Fred, Edwin B. |
| Altenhaus, Stuart |
| Altenhaus, Gloria |
| Crist, J. |
| Heilskov, G. |
| Caucutt, B. |
| Mark, B. |
| Barnes, J. |
| Quarnty, G. |
| Andrus, J. |
| Jones, A. |
| Zorhoff, C. |
| Paull, Thomas H. |
| Cool, J. |
| Evert, Chris |
| Connors, Jimmy |
| Smith, Ike Z. |
| News, Nightly |
| Jones, Ivan L. |
| Smith, R. |
| Mayer, N. |
| Gonring, J. |
| Mueller, D. |
| Bates, M. |
| Longlastname, A. |
| Zappa, F. |
| Ghandi, I. |
| Kirk, J. |
| Andermanthenol, K. |
| Uoiea, Z. |
| Birch, M. |
| Morgan, D. |
| Taylor, R. |
| Jones, J. |

Gringo, C.
Davis, Scott P.
Bates, Michael L.
Kaisler, Janet M.
Baskett, Wayse T.

+-----+

102 rows in set (0.00 sec)

8)

MySQL [cs5530db]> select s.sname from student s where s.year = 3 and s.age = (select max(s.age) from student s where s.year = 3);

sname
Kennedy, Ed

+-----+

1 row in set (0.00 sec)

9)

MySQL [cs5530db]> select s.sid, s.gpa, s.sname from student s where not exists (select c.cno from course c where not exists (select e.cno from enroll e where e.cno = c.cno and e.sid = s.sid));

Empty set (0.00 sec)

10)

MySQL [cs5530db]> select d.dname, d.numphds from dept d, (select distinct m.dname from major m, (select distinct sid from enroll where dname = "Computer Sciences") as students where m.sid != students.sid) as dep where d.dname = dep.dname;

dname	numphds
Chemical Engineering	32
Civil Engineering	88
Computer Sciences	47
Industrial Engineering	41
Mathematics	129
Sanitary Engineering	3

+-----+

6 rows in set (0.01 sec)

11)

MySQL [cs5530db]> select s.sname from student s, (select year, max(gpa) as gpa from student group by year) as year where year.gpa = s.gpa and year.year = s.year;

```
+-----+
| sname      |
+-----+
| Scott, Kim J. |
| Natividad, A. |
| Fred, Edwin B. |
| Altenhaus, Gloria |
| Quarnty, G.   |
| Andrus, J.     |
| Longlastname, A. |
| Zappa, F.      |
| Davis, Scott P. |
+-----+
```

9 rows in set (0.00 sec)

12)

MySQL [cs5530db]> select p.pname from (select profs.pname, count(*) as count from (select p.pname, s.sectno, s.cno from prof p, section s where p.pname = s.pname) as profs group by pname) as p where count = (select min(q.count) from (select profs.pname, count(*) as count from (select p.pname, s.sectno, s.cno from prof p, section s where p.pname = s.pname) as profs group by pname) as q);

```
+-----+
| pname      |
+-----+
| Walter, A. |
| Edison, L. |
| Brian, C.  |
| Brown, S.  |
| Bucket, T. |
| Smith, S.  |
| Clark, E.  |
+-----+
```

7 rows in set (0.00 sec)

13)

```
MySQL [cs5530db]> select yuh.dname, yuh.sname from (select distinct s.sname, m.dname,
dirka.avg from student s, major m, enroll e, (select sid, avg(grade) as avg from enroll group by
sid) as dirka where dirka.sid = s.sid and dirka.sid = m.sid) as yuh where yuh.avg = (select
max(yuh.avg) from (select distinct s.sname, m.dname, dirka.avg from student s, major m, enroll
e, (select sid, avg(grade) as avg from enroll group by sid) as dirka where dirka.sid = s.sid and
dirka.sid = m.sid) as yuh) order by dname;
```

dname	sname
Chemical Engineering	Baker, C.
Civil Engineering	Atny, Mary H.
Civil Engineering	Micheal, Zadicki T.
Civil Engineering	Moomchi, B.
Civil Engineering	Moeri, S.
Computer Sciences	Carter, Jimmy
Computer Sciences	Sulfate, Barry M.
Computer Sciences	Sather, Roberto B.
Computer Sciences	Stanley, Leotha T.
Computer Sciences	Bomber, C.
Industrial Engineering	Evert, Chris
Industrial Engineering	Connors, Jimmy
Mathematics	Kirk, J.
Mathematics	Andermanthenol, K.
Mathematics	Taylor, R.
Mathematics	Mueller, D.
Mathematics	Ghandi, I.
Sanitary Engineering	Sulfate, Barry M.

18 rows in set (0.22 sec)

14)

```
MySQL [cs5530db]> select yuh.dname, yuh.cno, yuh.sectno from (select cno, sectno, dname,
count(*) as count from enroll group by cno, sectno, dname) as yuh where yuh.count = (select
max(yuh.count) from (select cno, sectno, dname, count(*) as count from enroll group by cno,
sectno, dname) as yuh);
```

dname	cno	sectno
Computer Sciences	726	1

1 row in set (0.00 sec)

15)

MySQL [cs5530db]> select depts.dname from (select dname, count(*) as count from major group by dname) as depts where depts.count>5;

```
+-----+
| dname          |
+-----+
| Chemical Engineering |
| Civil Engineering   |
| Computer Sciences   |
| Industrial Engineering |
| Mathematics         |
+-----+
```

5 rows in set (0.00 sec)

16)

MySQL [cs5530db]> select * from (select courses.dname, courses.num_of_courses, profs.num_of_profs from (select * from (select dname, count(*) as num_of_courses from course group by dname) as c1 where exists (select 1 from (select dname, count(*) as num_of_courses from course group by dname) as c2 where c1.num_of_courses = c2.num_of_courses limit 1, 1)) as courses, (select dname, count(*) as num_of_profs from prof group by dname) as profs where profs.dname = courses.dname) as depts where num_of_profs = 1;

```
+-----+-----+-----+
| dname          | num_of_courses | num_of_profs |
+-----+-----+-----+
| Chemical Engineering |          1 |          1 |
| Mathematics         |          2 |          1 |
| Sanitary Engineering |          2 |          1 |
+-----+-----+-----+
```

3 rows in set (0.00 sec)

MySQL [cs5530db]>

PROBLEM 2

```
CREATE TABLE Emp(  
    eid INT PRIMARY KEY,  
    ename VARCHAR(30) NOT NULL,  
    age INT NOT NULL,  
    salary FLOAT(8,2) NOT NULL CHECK ( salary <= (SELECT e.salary FROM Emp e, Dept d,  
Works w, WHERE e.eid = d.managerid AND w.eid = d.managerid AND w.did = d.did AND w.eid =  
e.id))  
);
```

```
CREATE TABLE WORKS(  
    eid INT PRIMARY KEY,  
    did INT PRIMARY KEY,  
    pct_time FLOAT(3,2) CHECK(pct_time = 1.00),  
    eid INT FOREIGN KEY REFERENCES Emp(eid),  
    did INT FOREIGN KEY REFERENCES Dept(did)  
);
```

```
CREATE TABLE DEPT(  
    did INT PRIMARY KEY,  
    budget FLOAT NOT NULL,  
    managerid INT NOT NULL FOREIGN KEY REFERENCES Emp(eid) CHECK ((SELECT  
COUNT(*) FROM Emp e, WHERE managerid = e.eid) <= 2))
```