20BCS009 ANZAL HUSAIN ABIDI
DBMS ASSIGNMENT-9

>mysql use 20BCS009;

Table Name: Student

snum	sname	major	level	age
101	John	CS	SR	19
102	Smith	CS	JR	20
103	Jacob	ECE	SR	20
104	Tom	CS	JR	20
105	Sid	CS	JR	20
106	Harry	History	SR	21
107	Hellen	CS	JR	21
108	Bob	English	SR	22
109	Andy	ECE	JR	21
110	Charles	History	SR	23

Command:

```
>mysql create table Student(snum int primary key,
sname varchar(20),
major varchar(20),
level varchar(20),
age int);

>mysql insert into Student values(101, 'John', 'CS', 'SR', 19);
>mysql insert into Student values(102, 'Smith', 'CS', 'JR', 20);
>mysql insert into Student values(103, 'Jacob', 'ECE', 'SR', 20);
>mysql insert into Student values(104, 'Tom', 'CS', 'JR', 20);
>mysql insert into Student values(105, 'Sid', 'CS', 'JR', 20);
>mysql insert into Student values(106, 'Harry', 'History', 'SR', 21);
>mysql insert into Student values(107, 'Hellen', 'CS', 'JR', 21);
>mysql insert into Student values(108, 'Bob', 'English', 'SR', 22);
>mysql insert into Student values(109, 'Andy', 'ECE', 'JR', 21);
>mysql insert into Student values(110, 'Charles', 'History', 'SR', 23);
```

Table Name: Class

cname	meets_at	room	fid
CSC342	Morning	R128	201
CSC343	Noon	R128	203
CSC345	Night	R154	204
ECE300	Morning	R111	202
ECE301	Noon	R111	203
ENG366	Morning	R154	203
ENG367	Evening	R111	205
HIS320	Evening	R128	205

```
Command:
 >mysql create table Class(cname varchar(20) primary key,
 meets_at varchar(20),
 room varchar(20),
 fid int);


 >mysql insert into Class values('CSC342', 'Morning', 'R128', 201);
 >mysql insert into Class values('CSC343', 'Noon', 'R128', 203);
 >mysql insert into Class values('CSC345', 'Night', 'R154', 204);
 >mysql insert into Class values('ECE300', 'Morning', 'R111', 202);
 >mysql insert into Class values('ECE301', 'Noon', 'R111', 203);
 >mysql insert into Class values('ENG366', 'Morning', 'R154', 203);
 >mysql insert into Class values('ENG367', 'Evening', 'R111', 205);
 >mysql insert into Class values('HIS320', 'Evening', 'R128', 205);


Table name: Enrolled
 +------+--------+
 | snum | cname  |
 +------+--------+
 |  101 | CSC342 |
 |  101 | CSC343 |
 |  101 | CSC345 |
 |  101 | ECE300 |
 |  101 | ENG366 |
 |  102 | CSC343 |
 |  102 | CSC345 |
 |  102 | ECE301 |
 |  103 | ECE300 |
 |  103 | ECE301 |
 |  104 | CSC342 |
 |  104 | ECE301 |
 |  105 | CSC345 |
 |  105 | ECE300 |
 |  106 | ENG366 |
 |  106 | HIS320 |
 |  107 | CSC342 |
 |  107 | ENG366 |
 |  108 | ENG367 |
 |  108 | HIS320 |
 |  109 | ECE300 |
 |  109 | ECE301 |
 |  110 | ENG366 |
 |  110 | HIS320 |
 +------+--------+
Command:
 >mysql create table Enrolled(snum int, cname varchar(20));


 >mysql insert into Enrolled values(101, 'CSC342');
 >mysql insert into Enrolled values(101, 'CSC343');
 >mysql insert into Enrolled values(101, 'CSC345');
 >mysql insert into Enrolled values(101, 'ECE300');
 >mysql insert into Enrolled values(101, 'ENG366');
```

```
 >mysql insert into Enrolled values(102, 'CSC343');
 >mysql insert into Enrolled values(102, 'CSC345');
 >mysql insert into Enrolled values(102, 'ECE301');
 >mysql insert into Enrolled values(103, 'ECE300');
 >mysql insert into Enrolled values(103, 'ECE301');
 >mysql insert into Enrolled values(104, 'CSC342');
 >mysql insert into Enrolled values(104, 'ECE301');
 >mysql insert into Enrolled values(105, 'CSC345');
 >mysql insert into Enrolled values(105, 'ECE300');
 >mysql insert into Enrolled values(106, 'ENG366');
 >mysql insert into Enrolled values(106, 'HIS320');
 >mysql insert into Enrolled values(107, 'CSC342');
 >mysql insert into Enrolled values(107, 'ENG366');
 >mysql insert into Enrolled values(108, 'ENG367');
 >mysql insert into Enrolled values(108, 'HIS320');
 >mysql insert into Enrolled values(109, 'ECE300');
 >mysql insert into Enrolled values(109, 'ECE301');
 >mysql insert into Enrolled values(110, 'ENG366');
 >mysql insert into Enrolled values(110, 'HIS320');
```

```
Table name: Faculty
 +-----+-----------+--------+
 | fid | fname     | deptid |
 +-----+-----------+--------+
 | 201 | John      |    301 |
 | 202 | M. Shanks |    302 |
 | 203 | I. Teach  |    302 |
 | 204 | A. Zobrah |    303 |
 | 205 | M. Jensen |    303 |
 +-----+-----------+--------+
Command:
>mysql create table Faculty(fid int primary key, fname varchar(20), deptid int);


>mysql insert into Faculty values(201,'John', 301);
>mysql insert into Faculty values(202,'M. Shanks', 302);
>mysql insert into Faculty values(203,'I. Teach', 302);
>mysql insert into Faculty values(204,'A. Zobrah', 303);
>mysql insert into Faculty values(205,'M. Jensen', 303);
```

Exercise:

a) Find the names of all Juniours(Level = JR) who are enrolled in a class taught by I. Teach.

Command:

```
>mysql select distinct a.sname from Student a natural join Class b natural join Enrolled c natural join Faculty d where a.level = 'JR' and d.fname = 'I. Teach';
```

Output:

```
+--------+
| sname  |
+--------+
| Smith  |
| Tom    |
| Hellen |
| Andy   |
+--------+
```

b) Find the age of the oldest student who is either a History major or enrolled in a course taught by I. Teach.

Command:

```
>mysql  select a.sname, a.age from Student a natural join Class b natural join Enrolled c natural join Faculty d where d.fname = 'I. Teach' and a.major = 'History' and a.age = (select max(age) from Student a natural join Class b natural join Enrolled c natural join Faculty d where d.fname = 'I. Teach' and a.major = 'History');
```

Output:

```
+---------+------+
| sname   | age  |
+---------+------+
| Charles |   23 |
+---------+------+
```

c) Find the names of all classes that either meet in room R128 or have five or more students enrolled.

Command:

```
>mysql select b.cname,count(*) from Student a natural join Class b natural join Enrolled c natural join Faculty d where b.room = 'R128' or b.cname in (select cname from Enrolled group by cname having count(*)≥ 5) group by b.cname;
```

Output:

cname	count(*)
CSC342	3
CSC343	2
HIS320	3

d) Find the names of all students who are enrolled in two-class that meet at the same time.

Command:

```
>mysql  select a.sname from Student a natural join Class b natural join Enrolled c group by a.sname, b.meets_at having count(*) ⩾ 2;
```

Output:

sname
Bob
John
Hellen
Smith

e) Find the names of faculty members who teach in every room in which some class is taught.

Command:

```
 >mysql select * from Faculty where fid in (select fid from Class group by fid having count(*) = (select count(distinct room) from Class));
```

Output:

fid	fname	deptid
203	I. Teach	302

f) Find the names of faculty members for whom the combined enrollment of the course that they teach is less than five.

Command:
>mysql select * from Faculty where fid in (select fid from Class where cname in (select cname from Enrolled group by cname having count(*)<5));

Output:

fid	fname	deptid
201	John	301
202	M. Shanks	302
203	I. Teach	302
204	A. Zobrah	303
205	M. Jensen	303

g) For each level, print the level and the average age of students for that level.
Command:
>mysql select level,avg(age) from Student group by level;

Output:

level	avg(age)
JR	20.4000
SR	21.0000

h) For all levels except JR, print the level and the average age of students for that level.
Command:
>mysql select level,avg(age) from Student where level ≠ 'JR' group by level;

Output:

level	avg(age)
SR	21.0000

i) For each faculty member that has taught class only in room R128 print the faculty member’s name and the total number of classes he or she has taught.

Command:
>mysql select f.fname,count(*) from Faculty f natural join Class c natural join Enrolled e where c.room = 'R128' group by fname;

Output:

fname	count(*)
I. Teach	2
John	3
M. Jensen	3

j) Find the names of students enrolled in the maximum number of classes.
Command:
>mysql select * from Enrolled e natural join Student s group by e.snum order by count(*) desc limit 1;

Output:

snum	cname	sname	major	level	age
101	CSC342	John	CS	SR	19