

**Jessie George**  
**Homework 3**

**5.1**

**1.**

```
SELECT DISTINCT S.sname
FROM Student S, Faculty F, Enrolled E, Class C
WHERE S.level= 'JR'
AND
(E.snum = S.snum
AND C.name = E.cname
AND F.fid = C.fid
AND F.fname = 'I. Teach');
```

**2.**

```
SELECT MAX(S.age)
FROM Student S,
WHERE (S.major = 'History')
OR S.snum IN
(SELECT E.snum
FROM Faculty F, Enrolled E, Class C
WHERE C.name = E.cname
AND F.fid = C.fid
AND F.fname = 'I. Teach');
```

**3.**

```
SELECT C.name
FROM Class C,
WHERE (C.room = 'R128')
OR C.name IN
(SELECT E.cname
FROM Enrolled E
GROUP BY E.cname
HAVING COUNT(*) >=5);
```

**4.**

```
SELECT DISTINCT S.sname
FROM Student S
WHERE S.snum IN
(SELECT E1.snum
FROM Enrolled E1, Enrolled E2, Class C1, Class C2
WHERE E1.snum = E2.snum
AND E1.cname = C1.name
AND E2.cname = C2.name
AND C1.name <> C2.name
AND C1.meets_at = C2.meets_at);
```

**5.**

```
SELECT DISTINCT F.fname
FROM Faculty F
WHERE NOT EXISTS
((SELECT *
FROM Class C_All )
EXCEPT
(SELECT C.room
FROM Class C
WHERE C.fid=F.fid));
```

**11.**

```
SELECT DISTINCT S.sname
FROM Student S
WHERE S.snum NOT IN
(SELECT E.snum
FROM Enrolled E);
```

## **5.2**

**1.**

```
SELECT DISTINCT P.pname
FROM Parts P
WHERE P.pid IN
(SELECT C.pid
FROM Catalog C);
```

**2.**

```
SELECT DISTINCT S.sid, S.sname
FROM Suppliers S
WHERE NOT EXISTS
(SELECT P.pid
FROM Parts P
WHERE NOT EXISTS
(SELECT C.sid
FROM Catalog C
WHERE C.sid = S.sid AND C.pid=P.pid));
```

**3.**

```
SELECT DISTINCT S.sid, S.sname
FROM Suppliers S, Parts P, Catalog C
WHERE P.color = 'red' AND C.sid = S.sid AND C.pid = P.pid
GROUP BY s.sid, s.sname
HAVING COUNT(*) = (SELECT COUNT(*)
FROM Parts P1
WHERE P1.color = 'red');
```

4.

```
SELECT DISTINCT P.pname
FROM Parts P, Catalog C, Suppliers S
WHERE S.sname = 'Acme Widget Suppliers'
AND C.sid = S.sid
AND C.pid = P.pid
AND NOT EXISTS (SELECT *
FROM Catalog C1, Suppliers S1
WHERE S.sname <> 'Acme Widget Suppliers'
AND C1.sid = S1.sid
AND C1.pid = P.pid);
```

7.

```
SELECT DISTINCT C.sid
FROM Catalog C
WHERE NOT EXISTS (SELECT *
FROM Parts P
WHERE C.pid = P.pid AND P.color <> 'red');
```

8.

```
SELECT DISTINCT C.sid
FROM Catalog C
WHERE (C.sid IN
(SELECT C1.sid
FROM Catalog C1, Parts P1
WHERE C1.pid = P1.pid and P1.color = 'red'))
AND (C.sid IN
(SELECT C2.sid
FROM Catalog C2, Parts P2
WHERE C2.pid = P2.pid and P2.color = 'green'));
```

9.

```
SELECT DISTINCT C.sid
FROM Catalog C
WHERE (C.sid IN
(SELECT C1.sid
FROM Catalog C1, Parts P1
WHERE C1.pid = P1.pid and P1.color = 'red'))
OR (C.sid IN
(SELECT C2.sid
FROM Catalog C2, Parts P2
WHERE C2.pid = P2.pid and P2.color = 'green'));
```

### 5.3

1.

```
SELECT DISTINCT A.aname
```

```
FROM Aircraft A
WHERE NOT EXISTS
(SELECT E.eid
FROM Employees E, Certified C
WHERE C.aid = A.aid AND C.eid = E.eid AND E.salary<80000);
```

**5.**

```
SELECT DISTINCT E.eid, E.ename
FROM Employees E, Certified C, Aircraft A
WHERE C.eid = E.eid AND C.aid = A.aid AND A.aname LIKE 'Boeing%';
```

**6.**

```
SELECT A.aid
FROM Aircraft A
WHERE A.cruisingrange>=(SELECT MIN(F.distance)
FROM Flights F
WHERE F.from = 'Los Angeles' AND F.to = 'Chicago');
```

**7.**

```
SELECT DISTINCT F.from, F.to
FROM Flights F
WHERE NOT EXISTS (SELECT *
FROM Employee E
WHERE E.salary>100000
AND NOT EXISTS (SELECT *
FROM Certified C, Aircraft A
WHERE C.eid = E.eid
AND C.aid = A.aid
AND A.cruisingrange>=F.distance);
```

**8.**

```
SELECT DISTINCT E.ename
FROM Employees E, Certified C, Aircraft A,
WHERE C.eid = E.eid AND C.aid = A.aid AND A.cruisingrange>3000
AND NOT EXISTS (SELECT *
FROM Aircraft A1, Certified C1
WHERE C1.eid = E.eid AND C1.aid = A1.aid AND A1.aname LIKE 'Boeing%');
```

**9.**

```
SELECT F.departs
FROM Flights F
WHERE F.flno IN
((SELECT F1.flno
FROM Flights F1
WHERE F1.from = 'Madison' AND F1.to = 'New York' AND F1.arrives < '18:00')
UNION
```

```

(SELECT F1.flno
FROM Flights F1, Flights F2
WHERE F1.from = 'Madison' AND F2.to = 'New York'
AND F1.to <> 'New York' AND F2.from = F1.to
AND F2.departs > F1.arrives
AND F2.arrives < '18:00')
UNION
(SELECT F1.flno
FROM Flights F1, Flights F2, Flights F3
WHERE F1.from = 'Madison' AND F3.to = 'New York'
AND F1.to <> 'New York' AND F2.to <> 'New York'
AND F2.from = F1.to AND F3.from = F2.to
AND F2.departs > F1.arrives AND F3.departs > F2.arrives
AND F3.arrives < '18:00'));

```

**12.**

```

SELECT E.ename
FROM Employees E
WHERE E.eid IN
(SELECT C.eid
FROM Certified C, Aircraft A
WHERE C.aid = A.aid
AND A.cruisingrange > 1000)
AND NOT EXISTS
(SELECT *
FROM Certified C1, Aircraft A1
WHERE C1.eid = E.eid AND C1.aid = A1.aid
AND A.cruisingrange <= 1000);

```

**14.**

```

SELECT E.ename
FROM Employees E
WHERE (E.eid IN
(SELECT C.eid
FROM Certified C, Aircraft A
WHERE C.aid = A.aid
AND A.cruisingrange > 1000))
AND (NOT EXISTS
(SELECT *
FROM Certified C1, Aircraft A1
WHERE C1.eid = E.eid AND C1.aid = A1.aid
AND A.cruisingrange <= 1000))
AND (E.eid IN
(SELECT C2.eid
FROM Certified C2, Aircraft A2
WHERE C2.aid = A2.aid AND A2.aname LIKE 'Boeing%'));

```

## **5.4**

**1.**

```
SELECT E.ename, E.age
FROM Emp E, Works W1, Dept D1, Works W2, Dept D2
WHERE (W1.eid = E.eid AND W1.did = D1.did AND D1.dname = 'Hardware')
AND (W2.eid = E.eid AND W2.did = D2.did AND D2.dname = 'Software');
```

**3.**

```
SELECT E.ename
FROM Emp E
WHERE E.salary > ALL(SELECT D.budget
FROM Dept D, Works W
WHERE W.eid = E.eid AND W.did = D.did);
```

**4.**

```
SELECT DISTINCT D.managerid
FROM Dept D
WHERE 1000000 < ALL(SELECT D1.budget
FROM Dept D1
WHERE D1.managerid = D.managerid);
```

**8.**

```
SELECT E.ename
FROM Emp E, Dept D
WHERE E.eid = D.managerid
GROUP BY E.ename
HAVING EVERY (D.budget > 1000000) AND ANY (D.budget < 5000000);
```