5.1

1. SELECT DISTINCT S.Sname
FROM Student S, Class C, Enrolled E, Faculty F
WHERE S.snum = E.snum AND E.cname = C.name AND C.fid = F.fid AND
F.fname = 'I.Teach' AND S.level = 'JR'

2. SELECT MAX(S.age)
FROM Student S
WHERE (S.major = 'History')
        OR S.num IN (SELECT E.snum
                        FROM Class C, Enrolled E, Faculty F
                        WHERE E.cname = C.name AND C.fid = F.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 <> E2.cname
                AND E1.cname = C1.name
                AND E2.cname = C2.name AND C1.time = C2.time)

5. SELECT DISTINCT F.fname
FROM Faculty F
WHERE NOT EXISTS ((SELECT * FROM Class C)
                EXCEPT
                (SELECT C1.room
                FROM Class C1
                WHERE C1.fid = F.fid))

6. SELECT DISTINCT F.fname
FROM Faculty F
WHERE 5 > (SELECT COUNT (E.snum)
       FROM Class C, Enrolled E
       WHERE C.name = E.cname
       AND C.fid = F.fid)

7. SELECT S.level, AVG(S.age)
FROM Student S
GROUP BY S.level

8. SELECT S.level, AVG(S.age)
FROM Student S
WHERE S.level <> 'JR'
GROUP BY S.level

9. SELECT F.fname, COUNT(*) AS CourseCount
FROM Faculty F, CLASS C
WHERE F.fid = C.fid
GROUP BY F.fid,F.fname
HAVING EVERY (C.room = 'R128')

10. SELECT DISTINCT S.sname
FROM Student S
WHERE S.snum IN (SELECT E.snum
        FROM Enrolled E
        GROUP BY E.snum
        HAVING COUNT (*) >= ALL (SELECT COUNT(*)
                FROM Enrolled E2
                GROUP BY E2.snum))
11. SELECT DISTINCT S.sname
      FROM Student S
      WHERE S.snum NOT IN (SELECT E.snum
                FROM Enrolled E)

12. SELECT S.age, S.level
FROM Student S
GROUP BY S.age, S.level
HAVING S.level IN(SELECT S1.level
                                  FROM STUDENT S1
                                  WHERE S1.age = S.age
                                  GROUP BY S1.level, S1.age
                                  HAVING Count (*) >= ALL (SELECT COUNT(*)
                                                                    FROM Student S2
                                                                    WHERE S1.age = S2.age
                                                                    GROUP BY S2.level, S2.age))

Exercice 5.2

1. SELECT P.pname
FROM Parts P, Catalog C
WHERE P.pid = C.pid

2. SELECT S.sname
FROM Suppliers S
WHERE NOT EXISTS ((SELECT *
                                  FROM Parts P)
                                  EXCEPT(SELECT C.pid
                                  FROM Catalog C
                                  WHERE C.sid = S.sid)

3. SELECT S.sname
FROM Suppliers S
WHERE NOT EXISTS ((SELECT *
                                  FROM Parts P
                                  WHERE P.color = 'red')
                                  EXCEPT(SELECT C.pid
                                          FROM Catalog C, Parts P
                                          WHERE C.sid = S.sid AND
                                                    C.pid = P.pid AND P.color = 'red'))

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

5. SELECT DISTINCT C.sid
FROM Catalog C
WHERE C.cost > (SELECT AVG (C1.cost)
                 FROM Catalog C1
                 WHERE C1.pid = C.pid)

6. SELECT P.pid, S.sname
FROM Parts P, Suppliers S, Catalog C
WHERE C.pid = P.pid AND C.sid = S.sid
AND C.cost = (SELECT MAX (C1.cost)
                FROM Catalog C1
                WHERE C1.pid = P.pid)

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

8. SELECT DISTINCT C.sid
FROM Catalog C, Parts P
WHERE C.pid = P.pid AND P.color = 'red'
INTERSECT
SELECT DISTINCT C1.sid
FROM Catalog C1, Parts P1
WHERE C1.pid = P1.pid AND P1.color = 'green'

9. SELECT DISTINCT C.sid
FROM Catalog C, Parts P
WHERE C.pid = P.pid AND P.color = 'red'
UNION
SELECT DISTINCT C1.sid
FROM Catalog C1, Parts P1
WHERE C1.pid = P1.pid AND P1.color = 'green'

10. SELECT S.sname, COUNT(*) as Part
FROM Suppliers S, Parts P, Catalog C WHERE
P.pid = C.pid AND C.sid = S.sid
GROUP BY S.sname, S.sid HAVING EVERY (Parts.color='green')