

第四次作业

1.

```
SELECT O.pid
FROM O, C, A
WHERE O.cid = C.cid ∧ O.aid = A.aid ∧ C.city = A.city;
```

2.

```
SELECT O.aid
FROM O, C, A
WHERE O.cid = C.cid ∧ O.aid = A.aid ∧ NOT EXIST(
    SELECT *
    FROM C C1, A A1
    WHERE C.city = A.city ∧ C.cid NOT IN(
        SELECT O1.cid
        FROM O O1
        WHERE O1.aid = O.aid));
```

3.

(1)

```
SELECT O.cid
FROM O
GROUP BY O.cid
HAVING count(O.pid) = 1
```

(2)

```
SELECT C.cid
FROM C
WHERE 1 = ALL( SELECT count(O.pid)
                FROM O
                WHERE C.cid = O.cid)
```

(3)

```
T := SELECT O.cid, O.ordno, O.pid
      FROM O
SELECT T1.cid
FROM T T1, T T2
```

WHERE $T_1.cid = T_2.cid \wedge T_1.cid \text{ NOT IN} ($
SELECT $T_3.cid$
FROM $T\ T_3, T\ T_4$
WHERE $T_3.cid = T_4.cid \wedge T_3.pid \neq T_4.pid)$

4.

SELECT $A.aid, A.aname, year(O.orddate), sum(O.dols), count(*), count(O.cid)$
FROM A, O
WHERE $A.aid = O.aid$
GROUP BY $A.aid, A.aname, year(O.orddate)$
ORDER BY $year(O.orddate), sum(O.dols)$

5.

SELECT $C.cid, O_1.orddate, O_2.orddate$
FROM $C, O\ O_1, O\ O_2$
WHERE $C.cid = O_1.cid \wedge O_1.cid = O_2.cid \wedge O_2.orddate < O_1.orddate \wedge O_1.orddate \geq ALL($
SELECT $O_3.orddate$
FROM $O\ O_3$
WHERE $O_3.cid = O_1.cid) \wedge O_2.orddate \geq ALL($
SELECT $O_4.orddate$
FROM $O\ O_4$
WHERE $O_4.cid = O_2.cid \wedge O_4.orddat \neq O_1.orddate)$