

Given the following relational database schema:

Employee=(ID, name, position, officeN, phoneN,age)// **assume the name is unique.**

Committee=(title, meetingDate, startTime, endTime, location)// **You may use <,>,<=,>=,!= between dates and times.**

Membership=(ID,title, task) // **task = 'member' or 'chair'.**

Use a minimum number of operations and tables to express the following queries by SQL statements:

1. List the name of every employee who is a member (not chair) of at least three committees.

```
SELECT e.name
FROM Employee e INNER JOIN Membership m
ON m.ID = e.ID INNER JOIN Committee c
ON c.title = m.title
WHERE m.task = 'member'
GROUP BY e.name
HAVING count(*) > 2;
```

2. List the name of every employee who serving on every committee.

```
SELECT e.name
FROM Employee e INNER JOIN Membership m
ON m.ID = e.ID INNER JOIN Committee c
ON c.title = m.title
GROUP BY e.name
HAVING count(*) = (SELECT count(*) FROM Committee c);
```

3. For every employee, list the ID, name and number of committees he/she is serving on as member or chair.

```
SELECT e.ID, e.name, count(*) "Number of Commitee"
FROM Employee e INNER JOIN Membership m
ON m.ID = e.ID INNER JOIN Committee c
ON c.title = m.title
GROUP BY e.ID, e.name;
```

4. List the name of every employee who only serves (as member) on committees that meets in location H345.

```
SELECT e.name
FROM Employee e
WHERE e.ID IN (SELECT m.ID
FROM Membership m INNER JOIN Committee c
ON c.title = m.title
WHERE location = 'H345');
```

5. List the name of every employee who does not have a phone number.

```
SELECT name
FROM Employee
WHERE phoneN IS NULL;
```

6. List the ID and name of every employee who is not serving on any committee.

```
SELECT e.name, e.ID
FROM Employee
WHERE e.ID NOT IN (SELECT m.ID
FROM Membership m INNER JOIN Committee c
ON m.title = c.title);
```

7. List the title of every committee on which Sandy Liu or Barry Smith is serving.

```
SELECT c.title
FROM Employee e, Committee c, Membership m
WHERE (e.name = 'Sandy Liu' OR e.name = 'Barry Smith')
AND e.ID = m.ID
AND m.title = c.title;
```

8. List the name and position of oldest employees.

```
SELECT e.name, e.position
FROM Employee e
WHERE e.age >= ALL ( SELECT e.age FROM Employee e);
```

9. List the titles of every two committees which do not meet on the same date.

```
SELECT a.title, b.title
FROM Committee c
JOIN Membership m ON c.title = m.title
WHERE c.meetingDate != m.meetingDate;
```

10. List the name and position of every employee who does have phone number.

```
SELECT name, position
FROM Employee
WHERE phoneN != "NULL";
```