CS2102 Tutorial 5: SQL 3

Wk 8, Sem 2, 2017/8

1. **Solution:**

(a)
```
select stuid
from Presenters
group by stuid
having count(*) >= all
    (select count(*) from Presenters group by stuid)
```

(b)
```
select P1.stuid, P2.stuid
from Presenters P1, Presenters P2
where P1.stuid < P2.stuid
and P1.week = P2.week
group by P1.stuid, P2.stuid
having count(*) >= 5
```

(c)

```
-- Students who haven't presented yet
select stuid
from Students
where stuid not in (select stuid from Presenters)
and (select max(week) from Presenters) >= 3
union
-- Students who have presented
select stuid
from Presenters P
where
--
-- Case 1: check the interval before the student's
-- first presentation
--
(select min(week) from Presenters where stuid = P.stuid) >= 4
--
-- Case 2: check the interval after the student's
-- last presentation
--
or (select max(week) from Presenters) -
(select max(week) from Presenters where stuid = P.stuid) >= 3
--
-- Case 3: check the interval between two presentations P & P2
--
or exists (
    select 1
    from Presenters P2
    where P2.stuid = P.stuid
    and P2.week - P.week >= 4
    and not exists (
        select 1
        from Presenters P3
        where P3.stuid = P.stuid
        and P.week < P3.week
        and P3.week < P2.week
    )
)
```

Note that the following answer is incorrect as a student who has presented say in weeks 1,2, and 3 but did not present in weeks 4, 5, and 6 would be incorrectly excluded from the output.

```
-- Incorrect answer
select stuid
from Students
where (select max(week) from Presenters) >= 3
except
select stuid
from Students S
where exists (
    select 1
    from Presenters P1, Presenters P2, Presenters P3
    where P1.stuid = S.stuid
    and P2.stuid = S.stuid
    and P3.stuid = S.stuid
    and P2.week = P1.week + 1
    and P3.week = P1.week + 2
)
```

(d) Solution 1

```
with StudentInfo as (
    select P.stuid, count(*) as numQ, max(week) as lastWk
    from Presenters P
    group by stuid
    union
    select stuid, 0, 0
    from Students
    where stuid not in (select stuid from Presenters)
)
select stuid
from StudentInfo
order by numQ, lastWk, stuid
limit 2;
```

Solution 2

```
with StudentInfo as (
    select P.stuid, count(*) as numQ, max(week) as lastWk
    from Presenters P
    group by stuid
    union
    select stuid, 0, 0
    from Students
    where stuid not in (select stuid from Presenters)
)
select S1.stuid, S2.stuid
from StudentInfo S1, StudentInfo S2
where S1.stuid < S2.stuid
and not exists (
    select 1
    from StudentInfo S3
    where S3.stuid <> S1.stuid
    and S3.stuid <> S2.stuid
    and
    (
    (S3.numQ < S1.numQ) or
    (S3.numQ < S2.numQ) or
    ((S3.numQ = S1.numQ) and (S3.lastWk < S1.lastWk)) or
    ((S3.numQ = S2.numQ) and (S3.lastWk < S2.lastWk)) or
    ((S3.numQ = S1.numQ) and (S3.lastWk = S1.lastWk) and
        (S3.stuid < S1.stuid)) or
    ((S3.numQ = S2.numQ) and (S3.lastWk = S2.lastWk) and
        (S3.stuid < S2.stuid))
    )
)
```