603. Consecutive Available Seats

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Several friends at a cinema ticket office would like to reserve consecutive available seats.
Can you help to query all the consecutive available seats order by the seat_id using the following `cinema` table?

```
| seat_id | free |
|---------|------|
| 1       | 1    |
| 2       | 0    |
| 3       | 1    |
| 4       | 1    |
| 5       | 1    |
```

Your query should return the following result for the sample case above.

```
| seat_id |
|---------|
| 3       |
| 4       |
| 5       |
```

Note:

- The seat_id is an auto increment int, and free is bool ('1' means free, and '0' means occupied.).
- Consecutive available seats are more than 2(inclusive) seats consecutively available.

Solution

Approach: Using self `join` and `abs()` [Accepted]

Intuition

There is only one table in this problem, so we probably need to use **self join** for this relative complex problem.

Algorithm

First, let's see what we have after joining this table with itself.

> Note: The result of join two tables is the Cartesian product of these two tables.

```
select a.seat_id, a.free, b.seat_id, b.free
from cinema a join cinema b;
```

seat_id	free	seat_id	free
1	1	1	1
2	0	1	1
3	1	1	1
4	1	1	1
5	1	1	1
1	1	2	0
2	0	2	0
3	1	2	0
4	1	2	0
5	1	2	0
1	1	3	1
2	0	3	1
3	1	3	1
4	1	3	1
5	1	3	1
1	1	4	1
2	0	4	1
3	1	4	1
4	1	4	1
5	1	4	1
1	1	5	1
2	0	5	1
3	1	5	1
4	1	5	1
5	1	5	1

To find the consecutive available seats, the value in the a.seat_id should be more(or less) than the value b.seat_id, and both of them should be free.

```
select a.seat_id, a.free, b.seat_id, b.free
from cinema a join cinema b
  on abs(a.seat_id - b.seat_id) = 1
  and a.free = true and b.free = true;
```

seat_id	free	seat_id	free
4	1	3	1
3	1	4	1
5	1	4	1
4	1	5	1

At last, choose the concerned column seat_id, and display the result ordered by seat_id.

> Note: You may notice that the seat with *seat_id* '4' appears twice in this table. This is because seat '4' next to '3' and also next to '5'. So we need to use `distinct` to filter the duplicated records.

MySQL

```
select distinct a.seat_id
from cinema a join cinema b
  on abs(a.seat_id - b.seat_id) = 1
  and a.free = true and b.free = true
order by a.seat_id
;
```

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from cinema a join
cinema b on a.seat_id = b.seat_id + 1
or a.seat_id = b.seat_id-1
where a.free = 1 and b.free = 1
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FROM cinema
WHERE free = 1 AND
(seat_id - 1 in (select seat_id FROM cinema WHERE free = 1) OR
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```
select distinct a.seat_id from
    cinema a join cinema b on a.seat_id = b.seat_id + 1
            or a.seat_id = b.seat_id-1
    where a.free = 1 and b.free = 1
```

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and abs(c1.seat_id - c2.seat_id) = 1
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What is wrong with my solution?

SELECT seat_id
FROM (Select seat_id, LEAD(seat_id,1) OVER(ORDER BY seat_id) as next_seat_id, Count(Seat_id) OVER (Order by seat_id) AS total_seats FROM Cinema WHERE free = 1) t
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