Quiz 10 Solution

Kevin Lin

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1. Write a recursive select statement to compute the powers of two from $2^0, 2^1, 2^2, \cdots, 2^{10}$.

```
with twos(exp) as (
    select 1 union
    select 2 * exp from twos where exp < 1024
)

select exp from twos;
1
2
4
8
16
32
64
128
256
512
1024
```

2. Write a SQL statement that finds all perfect squares from 156 to 1145.

```
create table squares as
  with naturals(n) as (
    select 1 union
    select n + 1 from naturals where n < 50
  )
  select a.n * b.n as n
    from naturals as a, naturals as b
    where a.n = b.n
        and 156 < a.n * b.n and a.n * b.n < 1145;

select * from squares
169
196
...
1024
1089
```

3. We can use SQL to determine the anagrams of a word! Specifically, let's use SQL to find the anagrams of the word cats.

```sql
with given (char, weight) as (
  select 'c', 1 union
  select 'a', 10 union
  select 't', 100 union
  select 's', 1000
)

select a.char || b.char || c.char || d.char
from given as a, given as b, given as c, given as d
where a.weight + b.weight + c.weight + d.weight = 1111;
```