INSTRUCTIONS

- You have 5 minutes to complete this quiz.
- The exam is closed book, closed notes, closed computer, closed calculator.
- Mark your answers on the exam itself. We will not grade answers written on scratch paper.
- For multiple choice questions, fill in each option or choice completely.
  - □ means mark all options that apply
  - ○ means mark a single choice

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<thead>
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<th>Last name</th>
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<tr>
<td>First name</td>
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<td>All the work on this exam is my own. (please sign)</td>
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0. **Your thoughts?**  What was your favorite topic from CS 61A this semester?
1. **Anagrams**

Create a table **anagrams** that contains all the anagrams of a word like cats. An anagram is a rearrangement of the letters in a word. For example, tacs and sact are anagrams of cats.

*Hint*: Each letter must be used exactly once, so the sum of the **positions** should equal 1111.

```sql
CREATE TABLE anagrams as

WITH word(letter, position) AS (
    SELECT 'c', 1 UNION
    SELECT 'a', 10 UNION
    SELECT 't', 100 UNION
    SELECT 's', 1000
)

SELECT a.letter || b.letter || c.letter || d.letter
FROM word AS a, word AS b, word AS c, word AS d
WHERE a.position + b.position + c.position + d.position = 1111;

SELECT * FROM anagrams;
tacs
sact
...
ctsa
atsc
```

2. **Squares**

Using recursive SQL, create a table **squares** containing all the perfect squares between 156 and 1145.

```sql
CREATE TABLE squares AS

WITH naturals(n) AS (  
    SELECT 1 UNION  
    SELECT n + 1 FROM naturals where n < 50  
)

SELECT n * n
FROM naturals
WHERE 156 < n * n AND n * n < 1145;

SELECT * FROM squares;
169
196
...
1024
1089