

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**

Last name	
First name	
Student ID number	
CalCentral email (_@berkeley.edu)	
Discussion Section	____ _
<i>All the work on this exam is my own.</i> (please sign)	

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.

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.

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
```