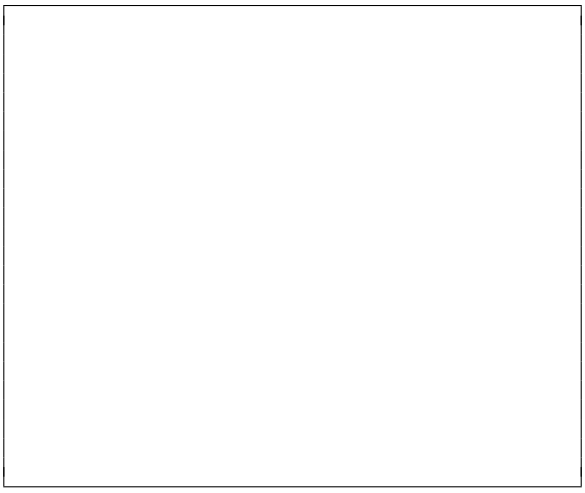
Name: _____ Andrew Id: _____

15-112 Fall 2023 Quiz 5

Up to 20 + 5 minutes (finish within 20 minutes for 1-point proficiency bonus)
No calculators, no notes, no books, no computers. Show your work!
Do not use lists, dictionaries, try/except, or recursion on this quiz.

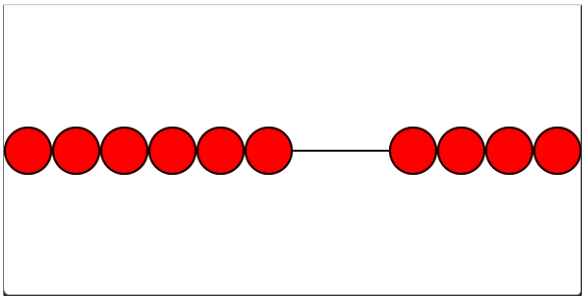
1. (8 points) **Code Tracing**: Indicate what the following program prints. Place your answer (and nothing else) in the box next to the code. Make sure strings are enclosed with quotes.

```
def f(s):
    s = s[:-1]
    return s

def ct(s):
    t = 'cmu'
    j = 0
    n = ''
    for i in range(len(s)):
        if s[i].isdigit():
            n = n + s[i]
        elif s.replace(s[i], t[j]) == s:
            print(i, t[j])
            j += 1
        else:
            print(f(s))
    print(n)
    return n*2

print(ct('ace42'))
```



2. (12 points) **Free Response**:

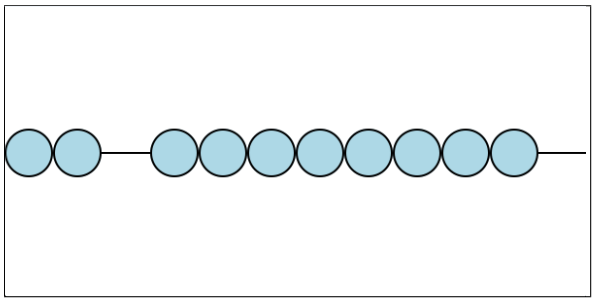
Write the function `drawAbacusRow(app, rowStr)`, which draws a set of 10 horizontally aligned circles that represent a row of sliding beads in an Abacus. The length of the row is equal to 12 times the diameter, which means there are always two empty slots in the row. Here's one example:



The function receives as input a string `rowStr` that specifies the beads' color and positions. The string starts with the color name and ends with 12 characters. Each character of the last twelve refers to one slot and specifies whether there's a bead or not in the specific slot in the row: a `0` indicates that there is a bead, and a `-` indicates that there is no bead in the corresponding slot. For instance, calling `drawAbacusRow(app, 'red000000--0000')` produces the graphics above.

You can assume that `app.width > app.height`. The row should span the entire width of the window. Your code should be able to handle window resizes. A line depicting the rod should be seen in the empty slots. You can assume that `cmu_graphics` is already imported and there a function `redrawAll(app)` that will call your function. As usual, this question will have partial credit.

Here's another example calling `drawAbacusRow(app, 'lightBlue00-00000000-')`



You may continue your work on the back of this page...

Additional Space for Answer to Question 2