Name: _____ Recitation: _____ Andrew Id: _____

15-112 Fall 2018 Quiz 4

Up to 20 minutes. No calculators, no notes, no books, no computers, no extra paper. Show your work!

Do not use dictionaries or recursion on this quiz.

1. (40 points) **Free Response:** Write the function `nearestWords(wordList, word)` that takes a wordlist and a single word (all words in this problem will only contain lowercase letters). The function returns a list of all the words in the wordlist that either match the given word or can be obtained by changing one letter. If no such words exist, the function returns an empty list.

   For example, `nearestWords(['cats','snarf','carts','cat','bats','cbts','abcd'],'cats')`
   should return `['cats','bats','cbts']`. There are no repeats in the wordlist.

2. (40 points) **Code Tracing**: Given that the box to the right is your canvas, with a width and height of 400 each, draw what the following code would display. You can assume that this is called within the appropriate graphics helper code. **Hint:** each of the small boxes on the canvas is 50x50 pixels.

```python
def drawCT(canvas, width, height):
    A=200
    B=A//2
    C=B//2
    D="It's art"

    canvas.create_text(A, A, text=D)
    canvas.create_rectangle(0, 0, A+B, A-B)
    canvas.create_oval(0, A-C, A-B, A+C)

    for i in range(-100,200,100):
        p0=(A+i*2, 0)
        p1=(A+i, width)
        canvas.create_line(p0, p1)

drawCT(canvas, 400, 400)
```
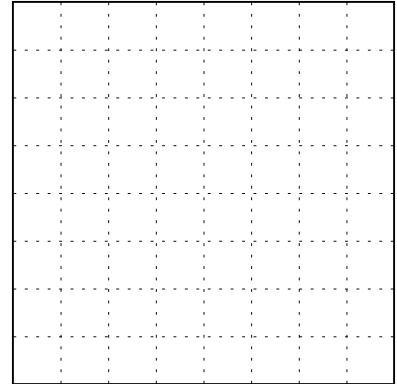
3. (20 points) **Reasoning Over Code**: Find an argument for the following program that makes it return True. Place your answer (and nothing else) in the box under the code.

```python
def roc(L):
    if (not isinstance(L, list)):
        return False
    A = []
    B = []
    while(L != []):
        A.extend([L.pop(), L.pop(0)])
        B = [L.pop(0), L.pop()] + B
    return A == list(range(2, 6)) and A == B
```