15-112 Summer-1 2017 Quiz 2
*Up to 45 minutes. No calculator, no notes, no books, no computers. Show your work!
No recursion!

1.**Code Tracing** [20 pts]: Indicate what these print. Place your answers (and nothing else) in the boxes below the code.

```
def ct1(s, t):
    for c in  s:
        if (c.upper() not in "NO!!!"):
            i = t.find(c)
            print (i, s[i], t[i], end = " ")

ct1("net", "two")
```

```




```

```
def ct2(a):
    (b, c) = (a, a[::])
    a[0] = 2
    b[0] = 3
    c[0] = 4
    print(a[0], b[0], c[0])
    a = c
    a[0] = 5
    b[0] = 6
    c[0] = 7
    print(a[0], b[0], c[0])

a = [8, 9]
ct2(a)
print(a[0])
```

```




```

2. **Reasoning Over Code** [20 pts]: Find an argument for the following function that makes it return True. Place your answers (and nothing else) in the boxes below the code.

```python
def roc1(s):
    t = ""
    for i in range(4):
        t = (chr(ord('B')+i) * i) + t
    return (s == t)
```

s =

```python
def roc2(a):
    assert(type(a) == list)
    assert(len(a) == 5)
    assert(a.count(0) == 1)
    i = 0
    while (a[i] != 0):
        (oldi, newi) = (i, a[i])
        assert(abs(newi - oldi) > 1)
        (a[oldi], i) = (0, newi)
    return (a == [0]*len(a))
```

a =

3. **Free Response 1: quizAverage(scores, student)** [30 pts]: We can store a table of quiz scores in a string, where each line represents the scores of a student, separated by a comma.
For example:

scores = """\
52,74,90
71,88,NS"""

This string includes two students who took 3 quizzes. Student 0 scored 52 on quiz 0, 74 on quiz1, and 90 on quiz2. If a student did not take a quiz, the score is entered as NS for "No Score". With this in mind, write the function quizAverage(scores, student) which takes a string of scores, as just described, and the index of a student, and returns the quiz average for that student subject to this constraint:

(1) "NS" scores do not affect any averages. So for student 1 in the example above the average would be (71 + 88)/2

You are guaranteed that the student index is valid (i.e if student index = 3, the scores string will have at least 4 lines - remember we count from 0). However, note it is possible that all of student's score are NS, in which case you should return None.

Hint: the string methods .splitlines() and .split() may be useful here.

4. **Free Response 2: ovalGrid(canvas, rows, cols, width, height)** [30 pts]: Write the function ovalGrid that takes a canvas and 4 positive integers -- width, height, rows, cols – and draws a rows x cols grind of ovals into the width x height canvas. The ovals in the diagonal are blue and otherwise red. In addition the diagonal ovals are labeled with numbers (starting at 1 for the top-left corner). The text should be in the center of the oval. Here, for example, is a 3x4 grid of ovals: