

Name: _____ Recitation: _____ Andrew Id: _____

15-112 Spring 2018 Quiz 4

Up to 20 minutes. No calculators, notes, books, or computers. Do not use dictionaries or recursion. Show your work!

1. (40 points) **Free Response:** Write the function `simpleStats(lst)` which takes a list of integers as input and returns a 3-tuple containing the mean, median, and mode of the list. The **mean** of a list is the average of its elements. The **median** of a list is the middle element when the list is sorted (or the average of the two middle elements if the list is even in length). The **mode** of a list is the most common element; if there are multiple most-common elements, the function can return whichever one you would like. If the list is empty, you should return `None`.

For example: `simpleStats([3, 5, 8, 2, 2])` should return `(4, 3, 2)`.

Note: this problem becomes significantly easier if you use built-in list methods. In fact, we encourage you to use them! However, you may not use the statistics library (as that would make this problem too easy).

2. (30 points) **Code Tracing:** Indicate what the following program prints. Place your answers (and nothing else) in the box to the right of the code.

```
def ct4(a):
    a[2] = "olympic"
    a[0], a[2] = a[2], a[0]
    print(" ".join(a))

    b = a
    b.insert(1, "games")
    b.pop()
    print(" ".join(b))

    c = b + []
    c = c[:-1] + ["are", "here"]
    return c

lst = ["2018", "!", "woo"]
print(" ".join(ct4(lst)))
print(" ".join(lst))
```

3. (30 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.

```
def drawCt4(canvas, width, height):
    a = 200
    canvas.create_oval(a-150, a-150, a+150, a+150)

    b, c = 150, 100
    canvas.create_rectangle(b, c, b+100, c+200)
    canvas.create_rectangle(b, c, b+50, c+50)
    canvas.create_rectangle(b+50, c+150, b+100, c+200)

    canvas.create_text(0, 50, anchor=W, text="HACK112!")
    canvas.create_line(width, 0, width/2, height)

drawCt4(canvas, 400, 400)
```

