Name: _____ Recitation: _____ Andrew Id: _____

15-112 Fall 2017 Quiz 6

Up to 25 minutes. No calculators, no notes, no books, no computers. You may not use recursion. Show your work!

1. (30 points) **Short Answer**: Answer the following questions in less than twenty words each:

   A. Write one line of code that could be added to init to make timerFired get called every 0.5 seconds.

   B. How does the following code violate MVC?

```
def redrawAll(canvas, data):
    data.x += data.dx
    canvas.create_rectangle(data.x, 50, data.x + 50, 100)
```

   C. Which variable made it possible for us to implement scrolling in the scrolling demo last Thursday? If you can't remember the variable's name, briefly describe its purpose instead.

2. (20 points) **Free Response**: Assume that an animation project has already been partially implemented, and you're adding code to it. This project makes a circle appear in a random location somewhere on the canvas. That circle is represented by four variables in data: data.color, data.radius, data.x, and data.y. Note that data.x and data.y represent the center of the circle.

   Write mousePressed(event, data), which changes the color of the circle to green if the user clicks inside the circle. You do not have to write any graphics or init code; only write mousePressed!

3. (50 points) **Free Response**: Using our animation framework and assuming run() is already written, write the init, mousePressed, keyPressed, timerFired, and redrawAll functions for an animation which has the following elements:

    1. A **blue square** which starts centered at the **bottom of the screen** and moves **up and down** over time, starting by moving up. The square changes direction when it hits the opposing wall.
    2. A **red circle** which starts centered at the **left edge of the screen** and moves **rightwards** over time. When the circle fully exits the screen, it reenters on the left side, creating a wraparound effect.
    3. Pressing the **left/right keys moves the blue square left/right**, but does not affect its vertical travel. The blue square is allowed to move off the screen this way.
    4. Pressing the **up/down keys increases/decreases the size of the red circle**, but does not affect its horizontal travel.

YOU MAY CONTINUE WRITING ANIMATION CODE ON THIS PAGE.

USE THIS PAGE FOR SCRAP WORK. WORK ON THIS PAGE WILL NOT BE GRADED.