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### 15-112 Spring 2014 Quiz 3

\* 17.5 minutes. No calculators, no notes, no books, no computers. No strings, lists, or recursion!

\* Do not discuss this quiz with anyone until after 5pm today. SHOW YOUR WORK, CIRCLE YOUR ANSWERS.

1. **Free Response: ballAnimation** [45 pts]

Write the function `ballAnimation(canvas, width, height, step)` which would be called as such:

```
stepAnimation.run(ballAnimation, width=250, height=100, timerDelay=1)
```

Your animation should start with a green ball of radius 20 centered at (0, 0). With each step, the ball moves one pixel to the right and also one pixel down. When the ball reaches the bottom of the canvas, it wraps around back up to the top, so it is repeatedly sweeping downward on the screen. Conversely, when the ball reaches the right side, it does not wraparound but instead reverses direction back to the left, so it repeatedly bounces right-and-left on the screen. Each time the ball returns to the left edge, the animation resets to (0,0) and starts over.

2. **Short Answer** [15 pts; 5 pts each]

a. Which (if any) of the following are quotes from the piazza post on reading (circle all that apply, and note that every quote is either exactly right or is very wrong, none are nearly right):

- i. "You need to show some of that CMU exceptionalism (I'm entirely serious)..."
- ii. "Studies clearly show that students who read well significantly outperform their peers."
- iii. "Angry consumers, failed products, injured companies, expensive lawsuits, tarnished careers."
- iv. "We will be offering optional small-group reading tutorials on Monday evenings."
- v. "To fail to read like an engineer is to fail to be an engineer. Period."

b. In just a few words, explain what OpenGL is.

c. Which (if any) of the following were mentioned in the piazza post on reading (circle all that apply):

snapchat

reddit

websockets

cgi

http

3. **Free Response: eitherIsPrefix(x, y)** [40 pts]

Write the function `eitherIsPrefix(x, y)` that takes two values of any type and returns `True` if they are both non-negative integers and either one of them starts with the other one. For example, `eitherIsPrefix(12, 1234)` returns `True` since 1234 starts with 12, and `eitherIsPrefix(1234, 12)` returns `True` for the same reason. Ignore leading 0's, so the only number to start with 0 is 0 itself. Be sure not to crash on any inputs. To receive any credit, you must not use strings here.

4. **Bonus/Optional:** [2.5 pts] What will this print? For credit, be sure to show your work!

```
def bonus(x, y, z=32): return (x+y) if (z>32) else bonus(y, x+y, 2*(x+y))
print bonus(6, 11)
```