Name:_____ Section:___ Andrew Id: _____ a

15-112 Spring 2020 Quiz 6

Up to 25 minutes. No calculators, no notes, no books, no other paper, no computers. No recursion

You may call almostEqual(x, y) and roundHalfUp(d) without writing them. Write everything else!

1. Multiple Choice [12pts]

Fill in the bubbles to indicate whether the following components of the Snake animation are part of the Model, View, or Controller.

1) app.foodPosition	◯ Model	◯ View	◯ Controller
2) drawSnake()	◯ Model	◯ View	◯ Controller
3) app.snake	◯ Model	◯ View	◯ Controller
4) drawGameOver()	◯ Model	◯ View	◯ Controller
5) app.margin	◯ Model	◯ View	◯ Controller
6) timerFired()	◯ Model	◯ View	◯ Controller
7) app.direction	◯ Model	◯ View	◯ Controller
8) drawFood()	◯ Model	◯ View	◯ Controller
9) redrawAll()	◯ Model	◯ View	◯ Controller
10) keyPressed()	◯ Model	◯ View	◯ Controller
11) takeStep()	◯ Model	◯ View	◯ Controller
12) placeFood()	◯ Model	◯ View	◯ Controller

2. Short Answer [18pts]

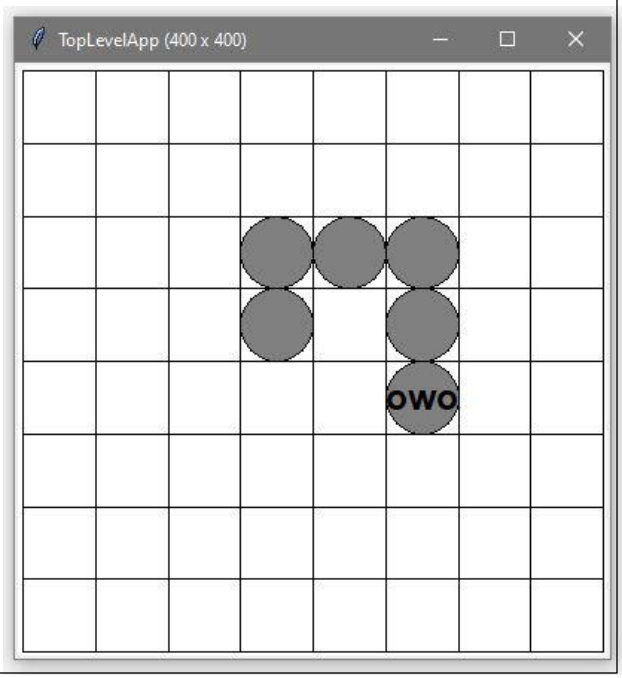
Fill in each blank to complete the getCell(app, x, y) function. You may assume pointInGrid(app, x, y) is already written. You may use the attributes app.width, app.height, app.margin, app.cols, and app.rows in your answer:

```
def getCell(app, x, y):
    # return (row, col) in which (x, y) occurred or (-1, -1) if outside grid.
    if (not pointInGrid(app, x, y)):
        return (-1, -1)

    gridWidth  = app.width  - ____________________________________

    gridHeight = app.height - ____________________________________

    cellWidth  = ________________________________________________

    cellHeight = ________________________________________________

    row = int(___________________________________________________)

    col = int(___________________________________________________)

    return (row, col)
```

3. Short Answer [10pts]

The image below shows one frame of our snake animation. Write the current value of app.snake below. (Note that we have drawn a cute face to let you know where the head of the snake is.)

app.snake =



4. Free Response: Falling Dot Animation [60pts]
Write an animation with the following features:

1. **A dot** with radius 20 begins at the center of the canvas.
2. **Clicking anywhere** in the canvas will create another circle with radius 20 centered at that location.
3. **Every 100ms**, each circle moves down by 5 pixels.
4. **Dots disappear** when they touch the bottom edge of the canvas.
5. **Pressing 'p'** will stop the dots from falling, but more dots can still be created by clicking the canvas.
6. **Pressing 'p' again** will cause the circles to resume falling.

To receive credit, **you must follow all MVC conventions!** Assume that we will call runApp() with an unknown but reasonable width and height.

Note: You may abbreviate app, event, and canvas as a, e, and c to save time.

5. Bonus CT (This problem is optional! Answer in the box to the right.) [1pts]

```
Def bonusCt(L):
    s = str(list(L))
    while (s.count("'") < 20): s = str(list(s))
    return s.count("'")
print(bonusCt(range(2)))
```