L5 PROBLEM 1 (5/5 points)

You have a bucket with 3 red balls and 3 green balls. Assume that once you draw a ball out of the bucket, you don't replace it. What is the probability of drawing 3 balls of the same color?

Write a Monte Carlo simulation to solve the above problem. Feel free to write a helper function if you wish.

```
    '''
    # Your code here
    def drawBall(n):
        """returns a random int between 0 and n-1"""
        return random.choice(range(n))

    yes = 0.0
    for i in range(numTrials):
        bucket = ['R']*3 + ['G']*3
        balls = []
        for j in range(3):
            index = drawBall(len(bucket))
            balls, bucket = balls + [bucket[index]], bucket[:index] + bucket[index+1:]
        if balls[0] == balls[1] and balls[1] == balls[2]:
            yes += 1
    return yes/numTrials
```

Correct

```
def oneTrial():
    '''
    Simulates one trial of drawing 3 balls out of a bucket containing
    3 red and 3 green balls. Balls are not replaced once
    drawn. Returns True if all three balls are the same color,
    False otherwise.
    '''
    balls = ['r', 'r', 'r', 'g', 'g', 'g']
    chosenBalls = []
    for t in range(3):
        # For three trials, pick a ball
        ball = random.choice(balls)
        # Remove the chosen ball from the set of balls
        balls.remove(ball)
        # and add it to a list of balls we picked
        chosenBalls.append(ball)
    # If the first ball is the same as the second AND the second is the same as the third,
    #  we know all three must be the same color.
    if chosenBalls[0] == chosenBalls[1] and chosenBalls[1] == chosenBalls[2]:
        return True
    return False

def noReplacementSimulation(numTrials):
    '''
    Runs numTrials trials of a Monte Carlo simulation
    of drawing 3 balls out of a bucket containing
    3 red and 3 green balls. Balls are not replaced once
    drawn. Returns the a decimal - the fraction of times 3
    balls of the same color were drawn.
    '''
    numTrue = 0
    for trial in range(numTrials):
        if oneTrial():
            numTrue += 1

    return float(numTrue)/float(numTrials)
```

Test results

See full output

CORRECT

See full output

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