Quiz 2

1. What does the following sample of code print? (If you think it will cause an error, say so)

```
speed = 15
time = 2
dist = speed * time

def calc_dist(speed,time):
    dist = speed * time
    return dist

speed = speed * 2
calc_dist(speed,time)

print(dist)
```

Answer: `dist` was last assigned to on line 3, and functions cannot alter the value of global variables outside of the function, so the program prints 30

2. What does the following sample of code print? (If you think it will cause an error, say so)

```
def collatz(number):
    if number % 2:
        result = 3 * number + 1
    else:
        result = number / 2
    return result

number = 15
collatz(number)
print("The result is:",result)
```

Answer: This code will result in a `NameError`, since `result` is destroyed after the function returns.

3. Consider the following program:

```
g = 10

def max_height(vi,theta):
    math.radians(theta)
    vy = vi * math.sin(theta)
    h = vy**2 / 2 / g
    return h

theta = 30 #launch angle, in degrees
vi = 10 #intl speed, m/s
```

   (a) Write some code to finish the program (that is, call the function and print the result) **Answer:**

```
ymax = max_height(vi,theta)
print(ymax))
```

   (b) With the given numbers for `vi` and `theta`, the programmer expected `max_height` to evaluate to "2.5", but finds instead the result is something completely different. Where is the error?
   Answer: The programmer meant to convert `theta` to radians with the line `math.radians(theta)`, but this does not alter the value of `theta`. They should have used an assignment statement such as `theta_radian=math.radians(theta)` and then used `theta_radian` for the rest of the function.