Greetings ,

My name is Leonidas Papadopoulos and I come from Athens, Greece. I am 25 years old and I study Electrical and Computer Engineering at the National and Technical University of Athens. In this jupyter notebook I am presenting my solution for the Collatz Conjecture. You can either study it and accept it or reject it, plain and simple :)

First of all, let's remember what Collatz conjecture states. Applying this function:

$$f(n) = \begin{cases} 3n + 1, n \quad odd \\ n/2, n \quad even \end{cases}$$

to any positive integer repeatedly, the final result will be equal to 1. Equivalently, because if n is odd, 3n+1 will be always even and will be divided by two, we apply this function:

$$f(n) = \begin{cases} (3n + 1)/2, n \quad odd \\ n/2, n \quad even \end{cases}$$

My conjecture: There exist infinite odds that this function is infinitely applied to them, thus the total number always increases to infinity and never gets 1.Let's count the number of times this function is applied and find the necessary conditions.

Bellow we have a function which counts the total number of times the function is applicable to a positive integer:

```python
In [2]: def collatz(n,times):
            if n%2!=0:
                return collatz((3*n+1)//2,times+1)
            else:
                return times
        collatz(255,0) #For number 255, 3*n+1 / 2 is applied 8 times before the number gets even
```

Out[2]: 8

Theorem:

For random ni odd, for the number $2 * ni + 1$, which is also odd, $f(number)$ is also odd.

Proof:

$(3 * (2 * ni + 1) + 1)/2 = (6 * ni + 4)/2 = 3 * ni + 2$. Because ni is odd, 3ni + 2 is also odd. *This means that starting ftom 1 and applying the operation number=2number +1*, collatz function returned value increases to infinity as our number increases to infinity.This means that there exist infinite odds for which the function $3n + 1/2$ is applied infinite times, thus the total number never gets 1.

Complete code:

```python
In [ ]: number=1
        import time
```

```
while True:
    print(number,collatz(number,0))
    number*=2
    number+=1
    time.sleep(0.5)
```

In [ ]:

```
while True:
    print(number,collatz(number,0))
    number*=2
    number+=1
    time.sleep(0.5)
```

In [ ]: