

WOLS1E

September 16, 2018

```
In [55]: def rFib(num):  # recursive
          sum = 0
          if num < 2:
              return num
          else:
              sum = rFib(num - 2) + rFib(num - 1)
          return sum

def fib(num):  # non-recursive
    f = [0, 1]
    for i in range(1, num):
        sum = f[i - 1] + f[i]
        f.append(sum)
    return f[num]

In [56]: from matplotlib import pyplot as plt
          import timeit

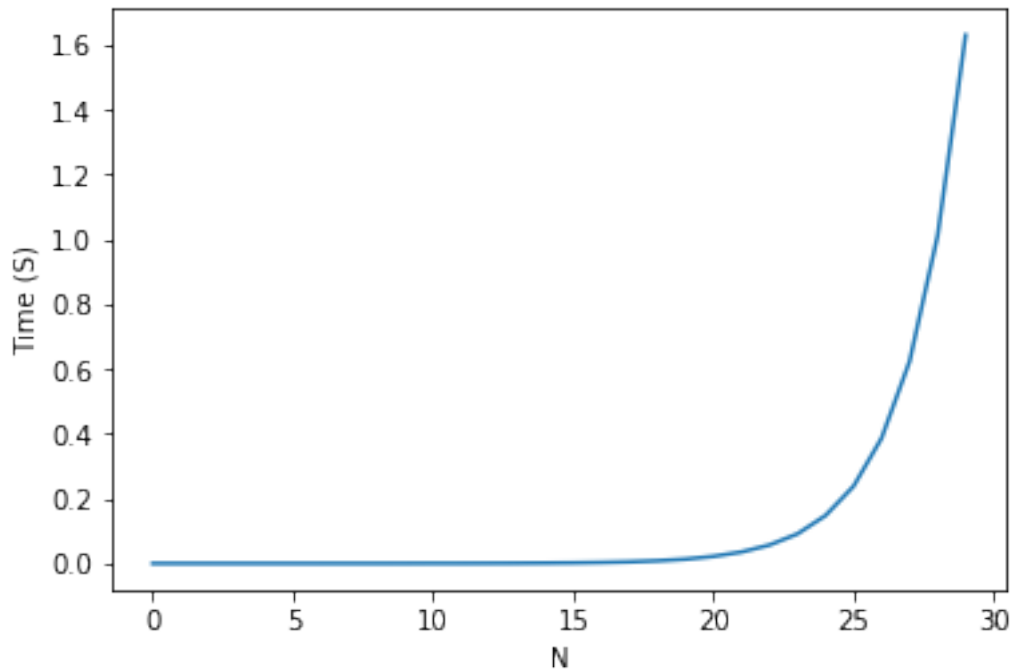
rFibS = """
def rFib(num):  # recursive
    sum = 0
    if num < 2:
        return num
    else:
        sum = rFib(num - 2) + rFib(num - 1)
    return sum
"""

fibNumber1 = []
executionTime1 = []
for i in range(30):
    fibNumber1.append(i)
    executionTime1.append(timeit.timeit(
        stmt=f"rFib({i})", setup=rFibS, number=10))

plt.plot(fibNumber1, executionTime1)
plt.xlabel("N")
```

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plt.ylabel("Time (S)")

plt.show()
```

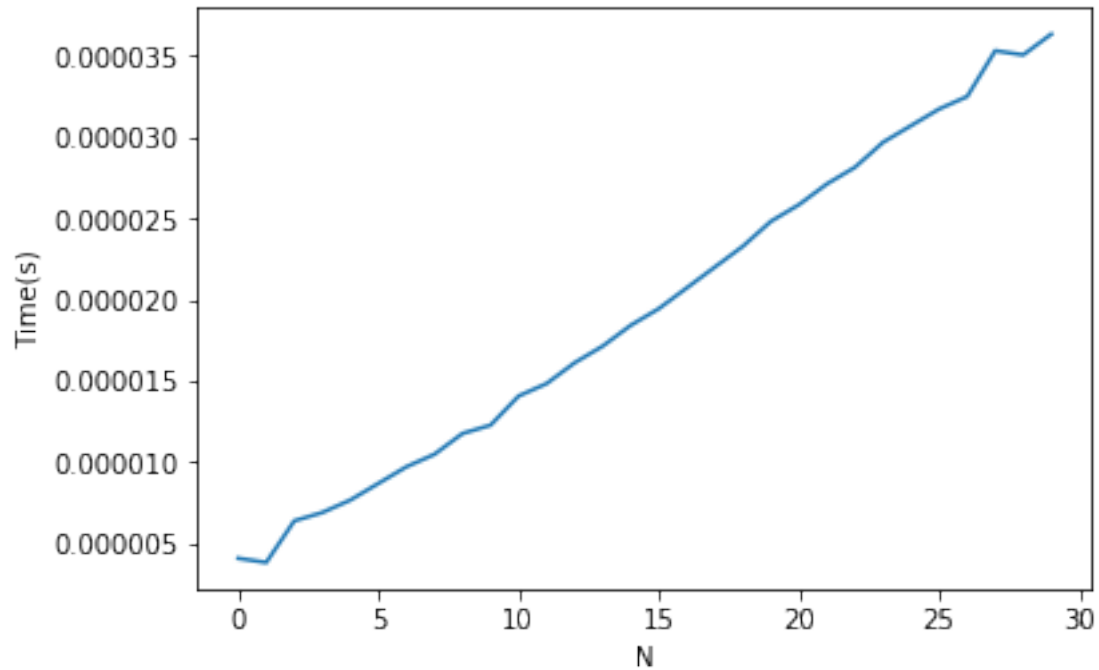


```
In [60]: fibS = """
def fib(num): # non-recursive
    f = [0, 1]
    for i in range(1, num):
        sum = f[i - 1] + f[i]
        f.append(sum)
    return f[num]
"""

fibNumber2 = []
executionTime2 = []
for i in range(30):
    fibNumber2.append(i)
    executionTime2.append(timeit.timeit(
        stmt=f"fib({i})", setup=fibS, number=10))

plt.plot(fibNumber2, executionTime2, label="Iterative")
plt.xlabel("N")
plt.ylabel("Time(s)")
```

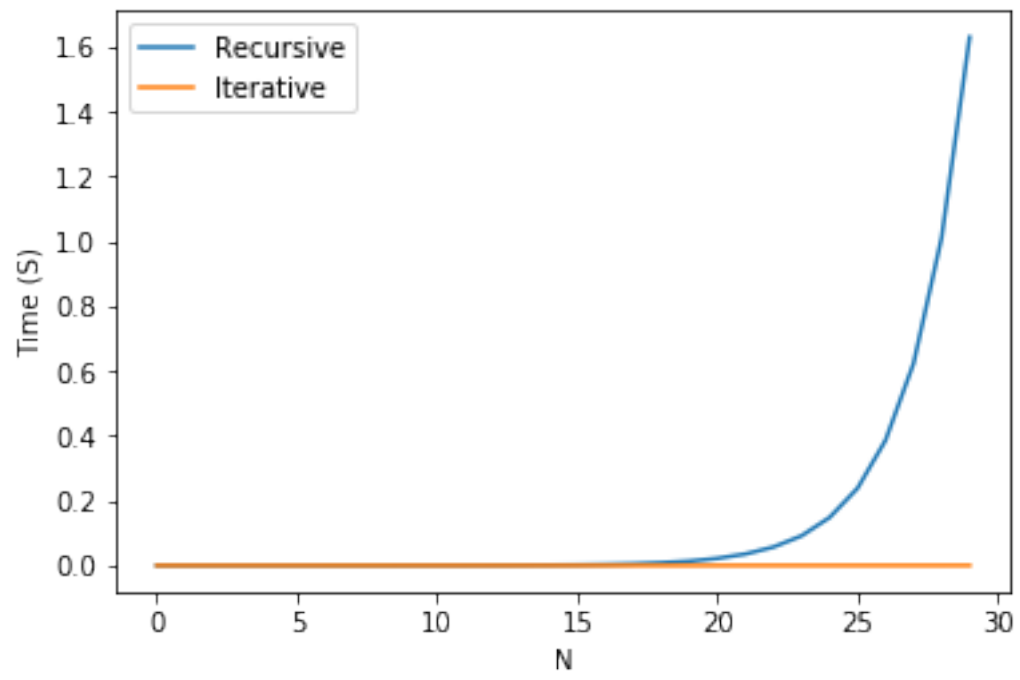
```
Out [60]: Text(0,0.5,'Time(s)')
```



```
In [61]: plt.plot(fibNumber1, executionTime1, label="Recursive")
plt.plot(fibNumber2, executionTime2, label="Iterative")

plt.xlabel("N")
plt.ylabel("Time (S)")
plt.legend()
```

```
Out[61]: <matplotlib.legend.Legend at 0x1d78759c5f8>
```



In []: