Even Fibonacci numbers

January 28, 2018

In [4]:
```
#By considering the terms in the Fibonacci sequence whose
#values do not exceed four million, find the sum of the even-valued terms.

#initiation
F=[]
F.append(1)
F.append(1)
Somme = 0
Borne = 4*(10**6)

#recurrence : on construit le nouveau terme et on le rajoute à la somme si pair
i=1
while F[i] <= Borne :
    F.append(F[i]+F[i-1])
    if (F[i+1]%2) == 0 :
        Somme = Somme + F[i+1]
    i=i+1

#output
print(Somme)

#note : cette solution occupe beaucoup de mémoire, car on garde tous les termes
#de la suite. On peut définir a=1, b=1 puis échanger dans la boucle c=a, a= b et b= a+c
```

```
4613732
```

Smallest multiple

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In [9]:
```
#What is the smallest positive number that is evenly divisible by all of the numbers from 1 to
```

```
def gcd(a,b):
    if a<b:
        return gcd(b,a)
    while b != 0:
       t = b
       b = a % b
       a = t
    return a

def lcm(a,b):
    return abs(a*b)/gcd(a,b)

def DivisibleByAll(n):
    x = lcm(1,2)
    for i in range(n-2):
        x = lcm(i+3,x)
    return x

DivisibleByAll(20)
```

Out[9]:
```
232792560.0
```

Sum square difference

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In [2]:
```
#Find the difference between the sum of the squares of the
#first one hundred natural numbers and the square of the sum.

#somme
def SommePremiersNaturels(n):
    return n*(n+1)/2

#somme carrés
def SommeCarrePremiersNaturels(n):
    return n*(n+1)*(2*n+1)/6

#réponse
print(abs(SommeCarrePremiersNaturels(100)-SommePremiersNaturels(100)**2))
```

```
25164150.0
```