Homework 1: Fibonacci

February 14, 2018

1 Problem

The goal of the first homework task was to find the sum of all even Fibonacci terms whose value was lower than four million. A Fibonacci term is described by the Encyclopedia of Mathematics as being the sum of the two preceding terms in the Fibonacci sequence [1]. By convention, the first two terms of the Fibonacci sequence are 1 and 1. Illustrated in Table 1 are the calculations for the next five Fibonacci terms.

Table 1: Fibonacci Sequence

Term	Calculation	Result
3	$1 + 1$	2
4	$1 + 2$	3
5	$2 + 3$	5
6	$3 + 5$	8
7	$5 + 8$	13

2 Solution

To solve this problem, I first wrote a function that would compute the Fibonacci terms up to four million and add them to a list. Then, using a for-loop, I added up every even term in that list. The resulting number, 4.613.732, is the sum of every even Fibonacci term smaller than four million. However, this was not a very efficient operation as the list and the for-loop made the code unnecessarily convoluted. Therefore, I relinquished the idea of the list and the for loop. Instead, I computed the Fibonacci numbers and, without saving all of them, immediately checked whether they were divisible by 2. If they were, they were instantly added to the sum of the other even Fibonacci numbers.

References

[1] N.N. Vorob'ev. Fibonacci numbers, Feb 2011.