Problem 2
Each new term in the Fibonacci sequence is generated by adding the previous two terms. By starting with 1 and 2, the first 10 terms will be:

$$1, 2, 3, 5, 8, 13, 21, 34, 55, 89, \ldots$$

By considering the terms in the Fibonacci sequence whose values do not exceed four million, find the sum of the even-valued terms.

Solution

Algorithm 1 Summing Even Fibonacci via Modular Selection

Let $x_1 = 1$ and $x_2 = 2$
Let $x_n = x_{n-1} + x_{n-2}, \forall n > 2$ while $x_n \leq 4,000,000$
if $x_n \mod 2 = 0$ **then** $\sum x_n$
end if