Prime Number Sieve Using LCM Function

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Abstract : Prime number sieve using LCM function is introduced .
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1 Introduction

French amateur mathematician Benoit Cloitre conjectured following :
Let $a_1 = 1$, for $n > 1$, $a_n = a_{n-1} + \text{lcm}(a_{n-1}, n)$ [1] , then $a_{n+1}/a_n - 1$ consists of 1's or primes only . In this note we present prime number sieve based on variation of this conjecture .

2 Main Result

Definition : Let $b_n = b_{n-2} + \text{lcm}(n-1, b_{n-2})$ with $b_1 = 2$, $b_2 = 2$ and $n > 2$.
Let $a_n = b_{n+2}/b_n - 1$

Conjecture :
1. Every term of this sequence , a_i , is either prime or 1 .
2. Every odd prime number is member of this sequence .
3. Every new prime in sequence is a next prime from the largest prime already listed .

Maxima implementation of sieve :

```
load(functs);

n:1000;
b1:2;
b2:2;
max:2;
k:3;
i:1;
while max<=n do (if i=1 then(print(max),i:0),b3:b1+lcm(k-1,b1), a:b3/b1-1, k:k+1,
b1:b2, b2:b3, if max<a then (max:a, i:1));
```

References

[1] OEIS Foundation Inc. (2011), The On-Line Encyclopedia of Integer Sequences, http://oeis.org/A135504 .