# Primes for a caveman

Nikolay Dementev

*Dormi Kyudai-Gakkentoshi, Rm.#411, 127-1, Tokunaga, Nishi-ku, Fukuoka-shi, 819-0375, Fukuoka, Japan*

Algorithm for determining whether given number is a prime or a composite is conjectured. The algorithm implies neither division operation, nor the counting to more than two to be an a priori knowledge.

KEYWORDS: primes, composites, set theory, factorization, analog computing

## 1. Introduction

Conventional definition of primes as numbers that have only two factors: itself and 1 is based on a priori knowledge of what the division is.[1] The latter one implies the awareness of the concept of counting to more than two.

On the other hand, the key methods of Georg Cantor's set theory, which is considered to be the foundation of mathematics, are based on much simpler concept of *one* vs. *many* and the operation of *comparison*.[2] Inspired by the approaches of set theory, a caveman-can-do protocol of determining whether the number of objects is represented by prime or a composite number is conjectured below.

## 2. Pillar method

For the sake of simplicity of explanation, let's assume that caveman has a heap of pebbles of equal size and shape. What protocol should we provide him with to let him to determine whether he has a prime number of pebbles or not? A following algorithm might be the solution:

1) Pebbles should be set in a row (*one vs. many*, step 1 in Fig.1,2)

2) Caveman is building pillars by taking the pebbles from the furthest right pillar and putting them from left to the right direction on top of the pillars, starting every new row from the furthest left pillar. Caveman checks whether all pillars are of the same height each time after he puts a pebble from right to the left side (*comparison*). Finding that all pillars are of the same height would mean that the number of pebbles is composite (step 8, Fig. 1), or the prime, otherwise. (Fig.2)

## 3. Concluding Remarks

Although the application of the algorithm to big numbers would be exhaustively time consuming on digital computers, the analog ones are expected to succeed in a reasonable time frame.

## References


1. Sarah Flannery with David Flannery, *In Code*, Algonquin Books of Chappel Hill, 2002

2. George Gamov, *One, Two, Three…Infinity*, Dover Publications, Inc., New York, 1988

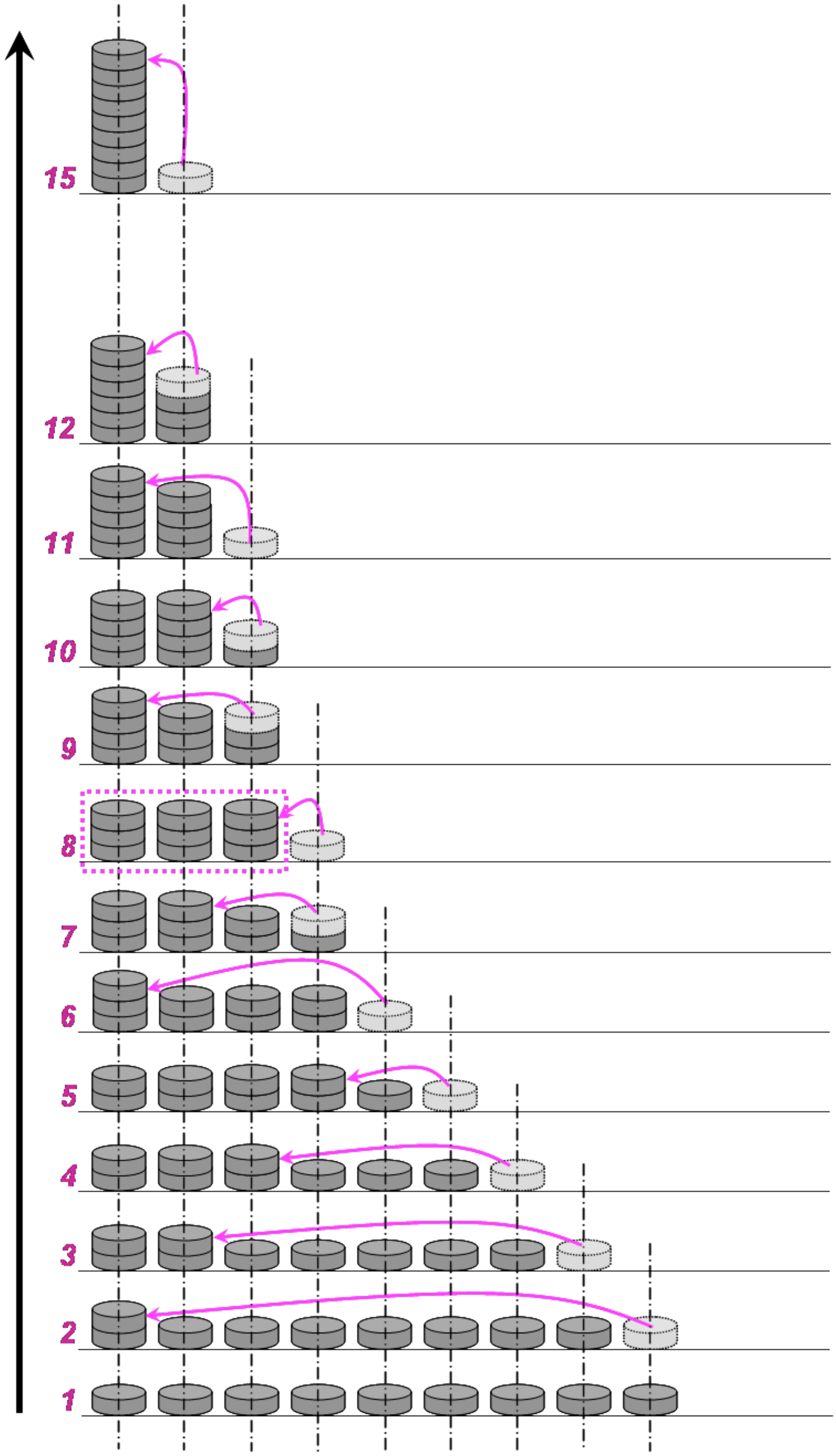


**Figure 1.** Pillar method applied to a composite number (nine) of pebbles.

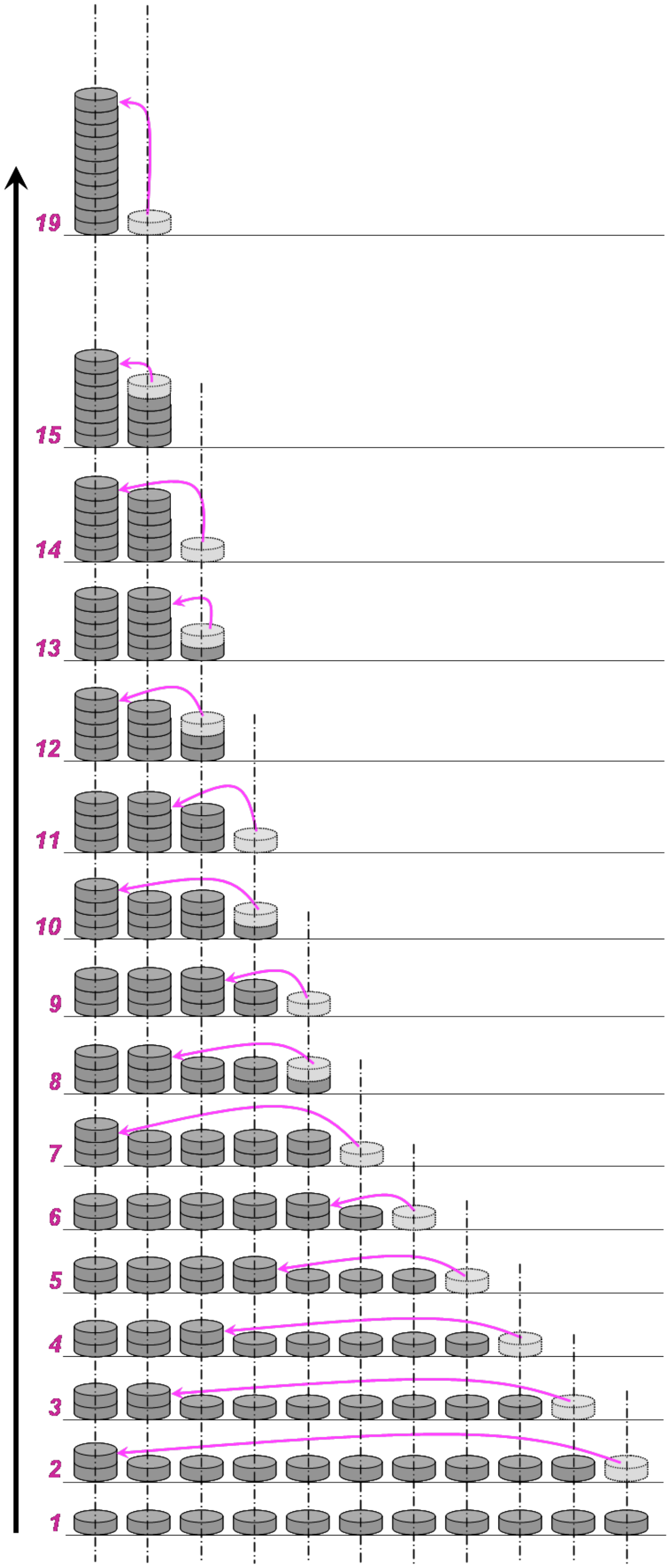


**Figure 2.** Pillar method applied to a prime number (eleven) of pebbles.