

# Parallel programming

MPI Interface

# 09 - Sum of an array

Write MPI program which compute a sum of randomly picked 1000000 elements of an array.

# 10 - The Sieve of Erathosthenes

The sieve of Eratosthenes is one of the most efficient ways to find prime numbers.

To find all the prime numbers less than or equal to a given integer  $n$  by Eratosthenes' method:

- Create a list of consecutive integers from 2 to  $n$ :  $(2, 3, 4, \dots, n)$ .
- Initially, let  $p$  equal 2, the first prime number.
- Starting from  $p$ , count up in increments of  $p$  and mark each of these numbers greater than  $p$  itself in the list. These will be multiples of  $p$ :  $2p, 3p, 4p$ , etc.; note that some of them may have already been marked.
- Find the first number greater than  $p$  in the list that is not marked. If there was no such number, stop. Otherwise, let  $p$  now equal this number (which is the next prime), and repeat from step 3.

When the algorithm terminates, all the numbers in the list that are not marked are prime.