

Laboratory Work No. 4

Prescan with OpenCL

The *exclusive scan* (or *prescan*) operation takes a binary associative operator \oplus with neutral element “0”, and a vector of values $[a_0, a_1, \dots, a_{n-1}]$, and returns the vector:

$$[0, a_0, (a_0 \oplus a_1), (a_0 \oplus a_1 \oplus a_2), \dots, (a_0 \oplus a_1 \oplus \dots \oplus a_{n-2})]$$

Using OpenCL, implement the host code and the kernel that compute the *prescan* of a vector with the parallel algorithm depicted in the example below for the vector $[3, 1, 7, 0, 4, 1, 6, 3]$:

