# *Tutorial No. 4*
# GPGPU with OpenCL

**Exercise 4.1**

Write an OpenCL program to multiply two square matrices on a GPU. Your program should investigate the presence and use the first GPU device on any of the platforms available.

**Exercise 4.2**

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

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

Using OpenCL, implement the kernel that computes 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]`: