An introduction to Vitis High Level Synthesis

Duc (Cothan) Tri Nguyen

13 April 2021

1 Vector-vector Multiplication

Given vector a, b, c, calculate vector e, the result is sum all elements in e multiply with $alpha$.

$$\begin{pmatrix} a_0 \\ a_1 \\ . \\ . \\ . \\ a_{n-1} \end{pmatrix} \cdot \begin{pmatrix} b_0 \\ b_1 \\ . \\ . \\ . \\ b_{n-1} \end{pmatrix} + \begin{pmatrix} c_0 \\ c_1 \\ . \\ . \\ . \\ c_{n-1} \end{pmatrix} = \begin{pmatrix} e_0 \\ e_1 \\ . \\ . \\ . \\ e_{n-1} \end{pmatrix} \tag{1}$$

$$E = (e_0 + e_1 + e_2 + \cdots + e_{n-1}) = \sum_{i=0}^{n-1} e_i \tag{2}$$

$$S = alpha * E \tag{3}$$

Vector-vector multiplication as shown in (1).
Sum of vector in (2).
Scalar multiplication shown in (3).