The degree of objects similarity

Consider you have a set of objects that can be described by set of properties (expressed numerically). You need to calculate degrees of objects similarity (closeness).

Input:

$$A(m \times n) = \begin{pmatrix} a_{0,0} & a_{0,1} & \dots & a_{0,n} \\ a_{1,0} & a_{1,1} & \dots & a_{1,n} \\ \dots & \dots & \dots & \dots \\ a_{m,0} & a_{m,1} & \dots & a_{m,n} \end{pmatrix}, \quad m \neq n$$

It needs to calculate distance between each possible couple of Matrix rows. You can use any distance formula.

For instance: $d_{i,j} = \sum_{k=0}^{n} (a_{i,k} - a_{j,k})^2$

Example:

$$A = \begin{pmatrix} 0 & 1 & 1 \\ 4 & 0 & 2 \\ 3 & 1 & 1 \\ 0 & 0 & 0 \\ 2 & 1 & 2 \end{pmatrix} \Rightarrow D = \begin{pmatrix} 0 & 18 & 9 & 2 & 5 \\ 18 & 0 & 3 & 20 & 5 \\ 9 & 3 & 0 & 11 & 2 \\ 2 & 20 & 11 & 0 & 9 \\ 5 & 5 & 2 & 9 & 0 \end{pmatrix}$$

Task: Implement this algorithm with CUDA (with global and shared memory). You can define row count divisible by 32 (or 16). You need to define kernel configuration and do speedup test with different task sizes.