Progress Report

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1 Goal

The goal of this project is to build and evaluate a stencil skeleton for an existing skeleton-based parallel programming library.

2 Design

The interface design basically follows existing skeletons. The structure of Stencil1D is illustrated in Figure 1. At the core of the skeleton, a thread constructs a data block and pass its pointer to elemental() to do the main computation. Stencil2D shares a similar structure but has 2 extra parameters which are the number of rows and columns.

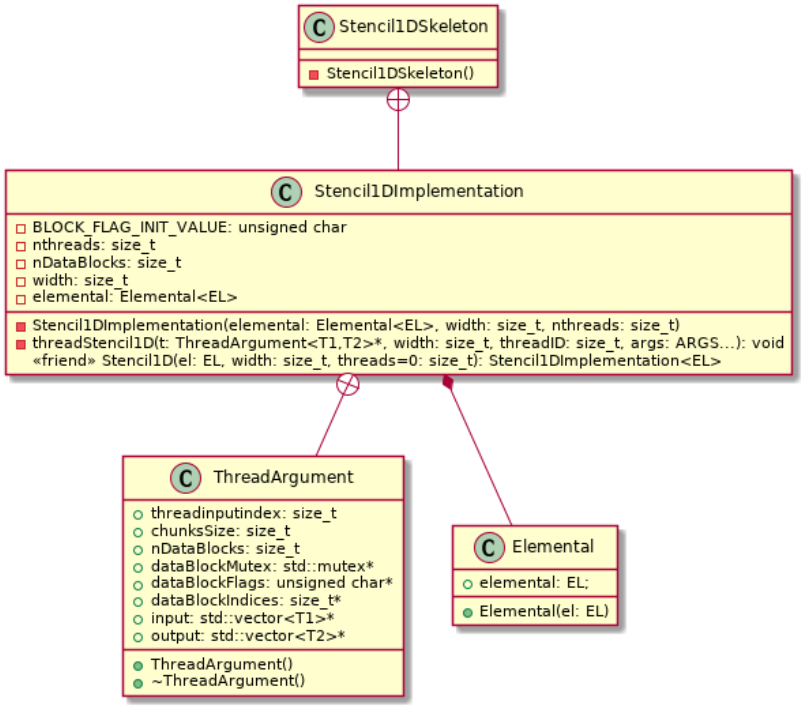

Figure 1: Stencil1D class diagram

3 Progress

Two skeletons, `Stencil1D` and `Stencil2D`, have been added to the library. I implemented two simple examples for each skeleton. One example sums up neighbours and the other finds the median among neighbours. I also implemented the sequential version of these two examples. I only implemented pthread version for 1D sum and median examples.

4 Plan

I will add the number of iterations to the interface so it will be suitable for iterative examples. Without it, users could call stencil multiple times, but it will terminate and recreate threads every time it is called. I will add fixed value as another option for boundary decisions. The current implementation of both skeletons wraps around at boundaries. I will implement more examples and do more testing.