Extending Distributed Functionality in Phylanx

Phylanx Year 3 Meeting

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Distributed Phylanx

- Map operations
  - No Data Dependencies
- Distributed Data Structures
  - distributed_object
    - UPC++
  - distributed_vector/matrix
  - Annotations
- Distributed Primitives
- Tiling testing
- Tiling Optimizer

dot_d 2d2d

- Uses same type of algorithm as other dot_d primitives
- Iterates through all tiles of RHS
  - Performs multiplication if intersection detected
  - Column width of tiles important
- Result matrices may be large

Cannon's Algorithm

- Matrix Matrix multiplication algorithm
- Different Communication Pattern from dot_d

Cannon's Algorithm

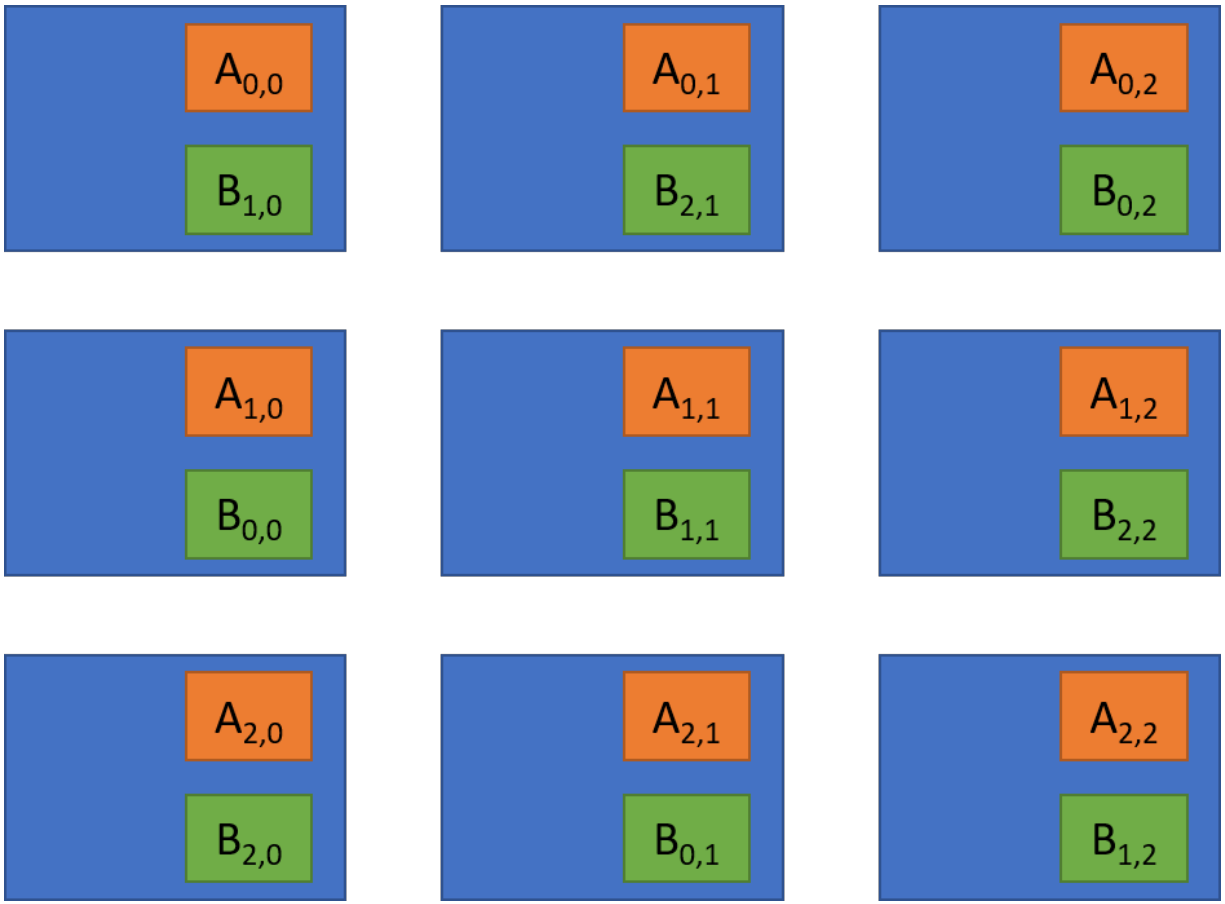

Figure 1: Starting Point

Cannon's Algorithm

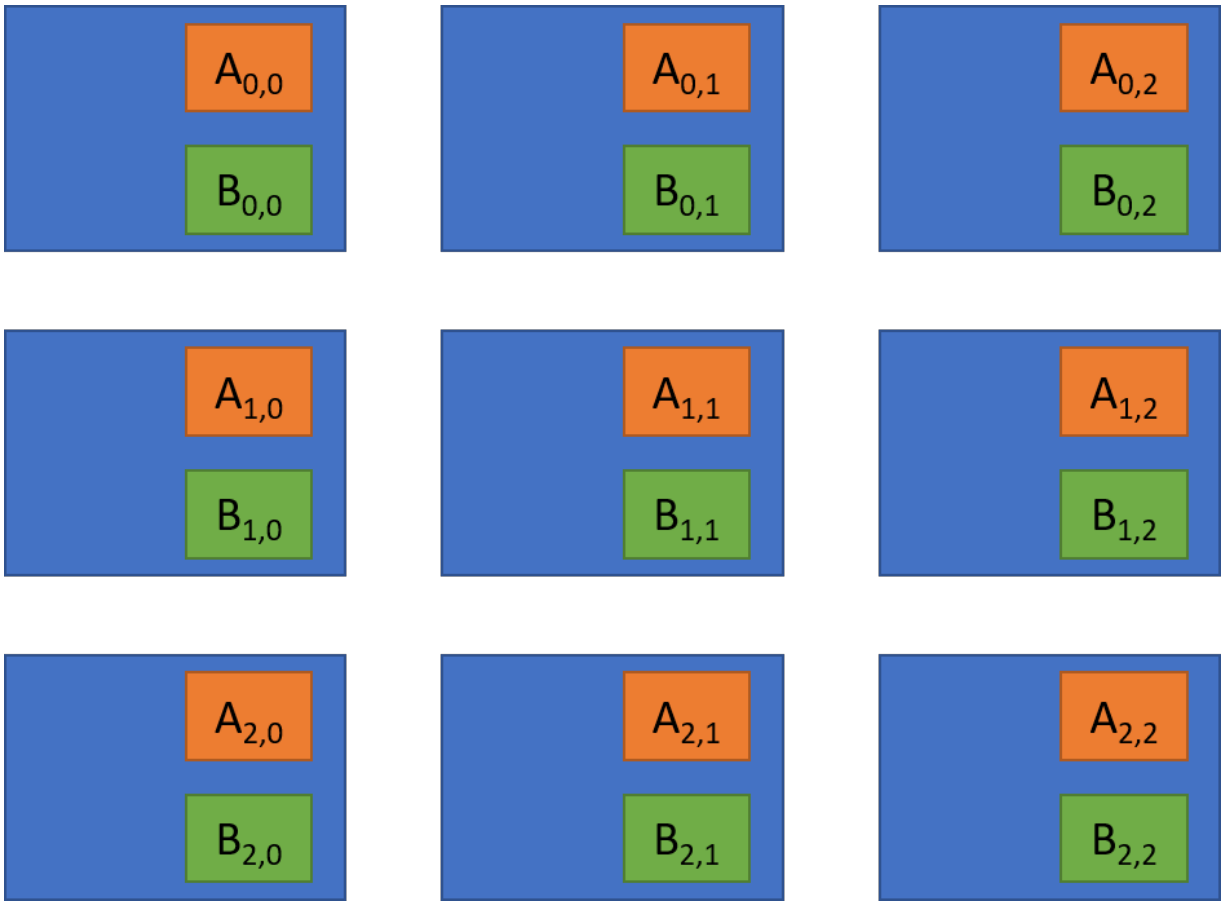

Figure 2: Alignment

Cannon's Algorithm

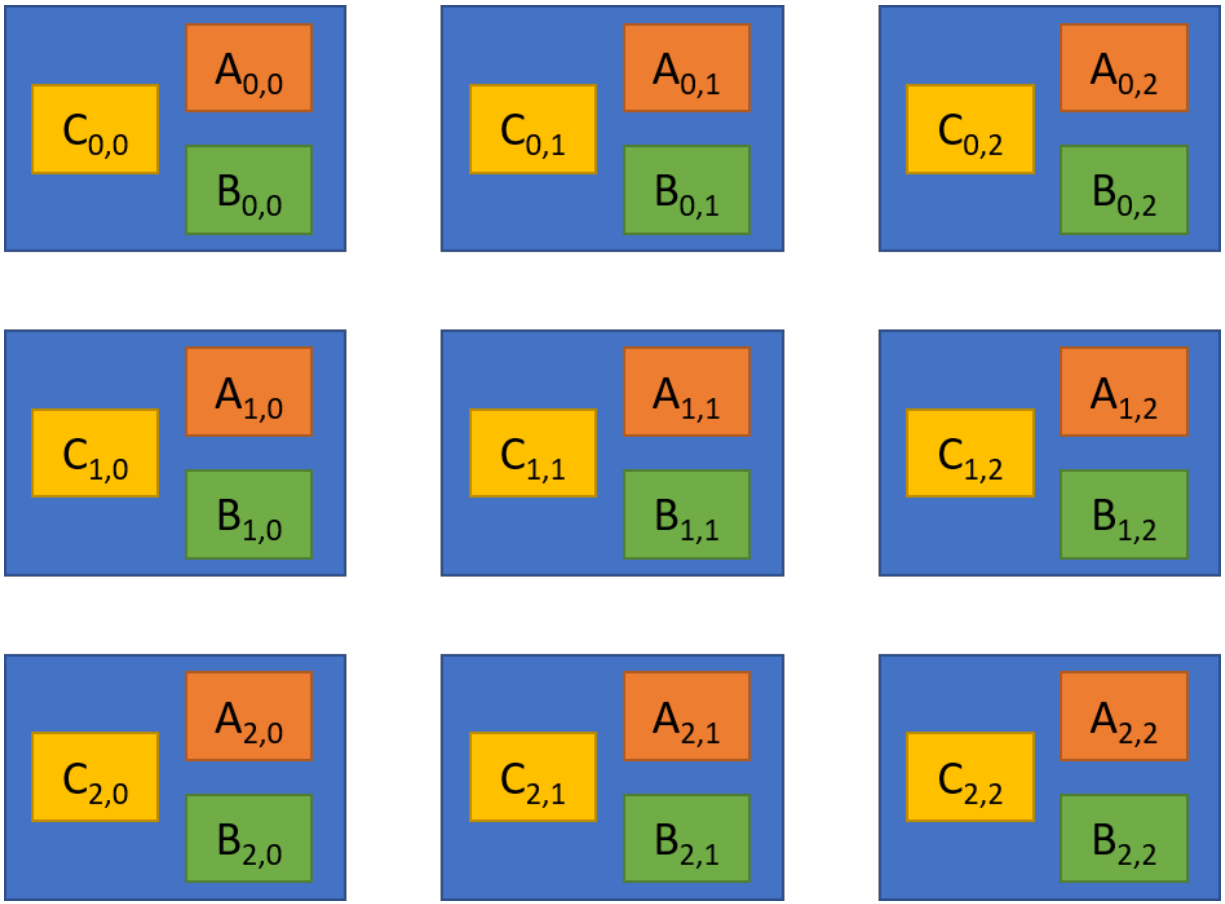

Figure 3: Multiply Local Values

Cannon's Algorithm

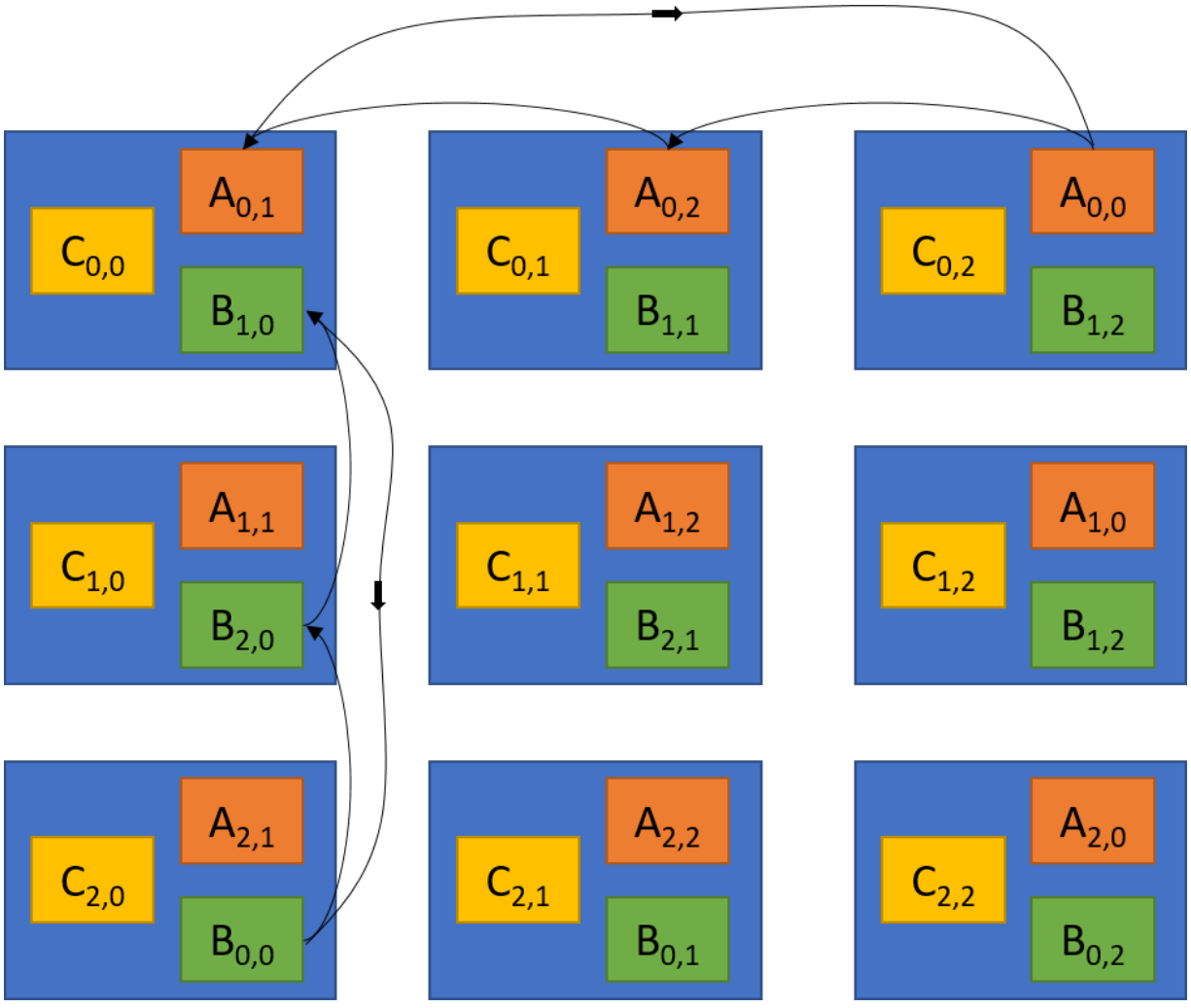

Figure 4: Shift Data

Cannon's Algorithm

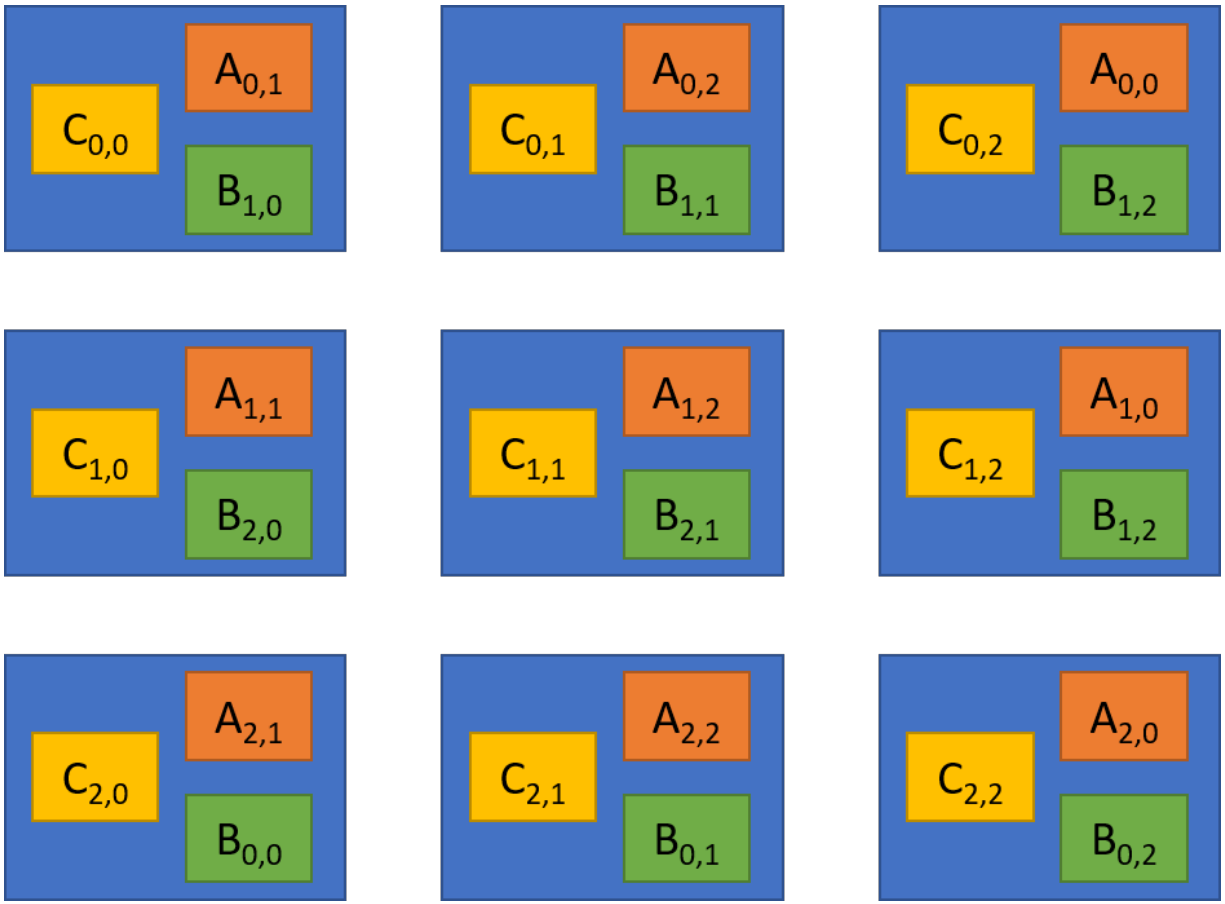

Figure 5: Multiply Local Values

Cannon's Algorithm

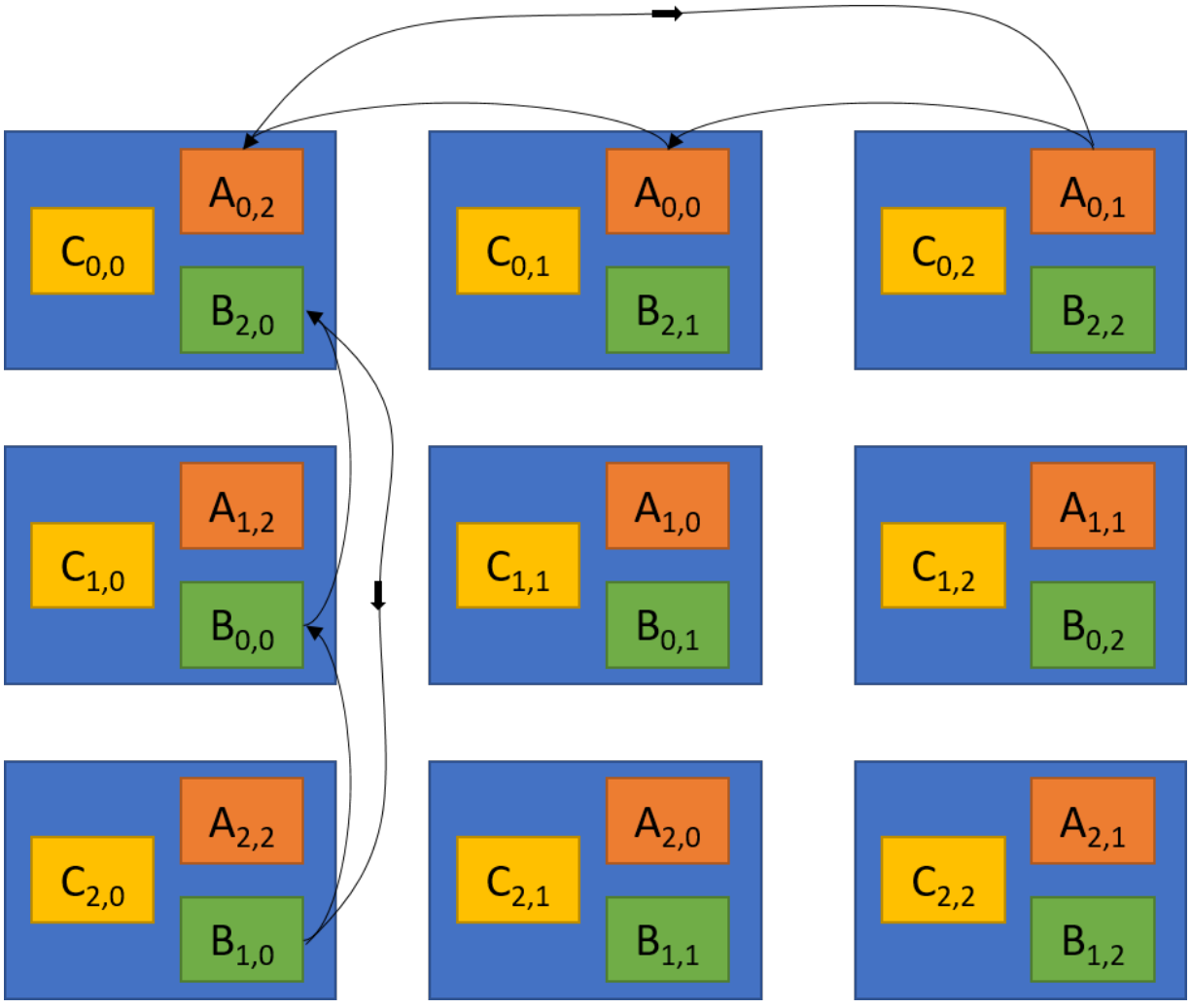

Figure 6: Shift Data

Cannon's Algorithm

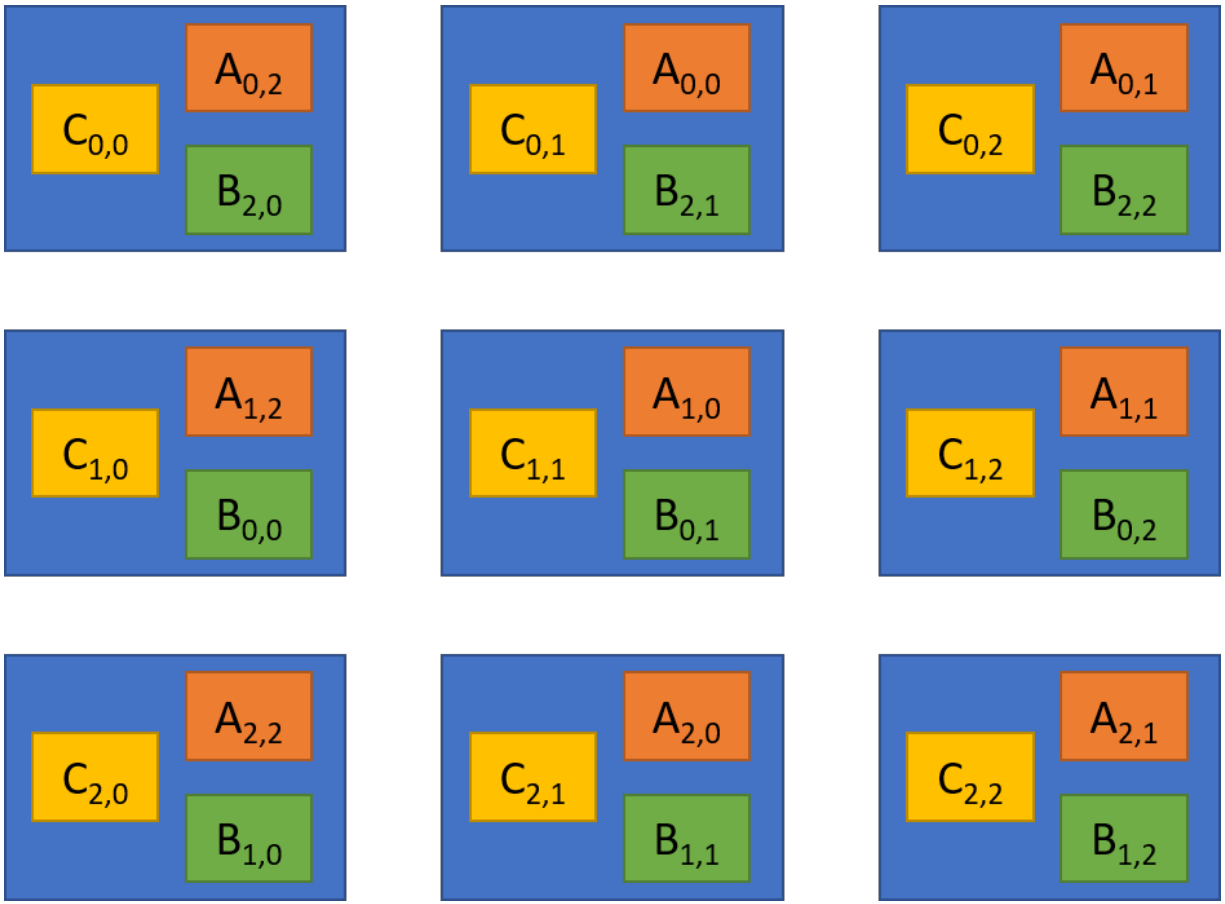

Figure 7: Multiply Local Values

Distributed CSV Read

- Currently no Distributed Data Loading
  - Manual specification of data in PhySL strings
- Bottleneck to serious testing
- Simple Fix
  - Base off existing CSV read primitive
  - Use filename as custom basename for finding participating localities

Questions?