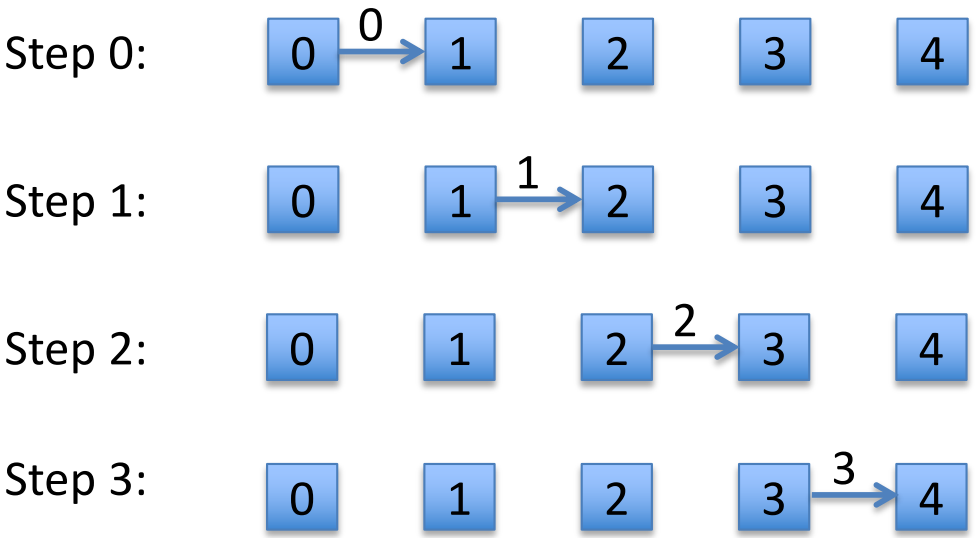
Homework 1

Message Passing hw #1

Deadline: Feb 20 2019

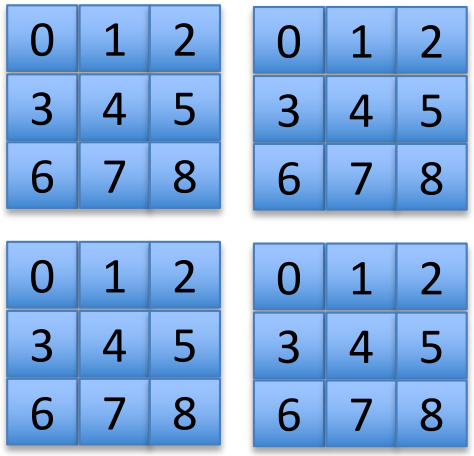
Ring Application

- Write a simple application that passes a token between all the processes in one communicator.



Process Grids

- Imagine a matrix distributed over a 2D block-cyclic block-cyclic distribution
- Use the minimum number of MPI functions to create row and column communicators



Multi-pipeline communications

- Merge the first and second part of this homework to create an example of application where everybody has a token originally and they pass it around in each dimension.
  - The token received from the west is passed to the east at the next iteration, while the token received from the north is passed to the south at the next iteration
  - How many steps we need to have a full exchange (e.g. every process have seen all tokens on it's line and column of processors).

Matrix Transpose

- The goal is to transpose a NxN C-matrix stored over PxQ processors in a block,block way in the most eccentric way. Build the required datatypes and write the MPI application.

What to turn in

- Source code and a Makefile
  - Make sure the code works as expected (check it with bi/tri-diagonal matrices as an example)
- A pdf describing your findings.