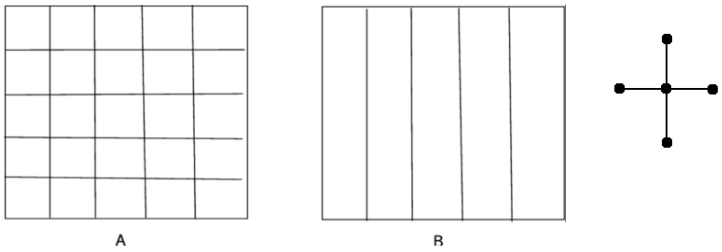
Parallel Computing
Exercise session 1

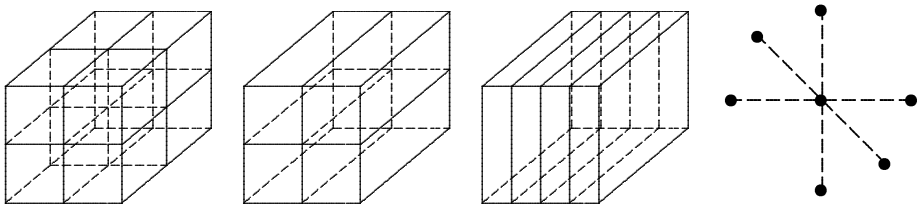
2D/3D grid-oriented problem

Consider a 2D grid-oriented problem with equal number of grid points in each direction (i.e. a 2D regular grid). Assume that there are in total M grid points. Consider 2 partitionings A and B as shown in the following figure.



a) Assume a 5-point finite difference computational molecule.Compute for each partitioning the communication cost using the BSP cost model. Assume that there is no load imbalance. Analyze how the communication cost depends on the number of processors.

b) Now consider a 3D grid and a 7 points finite difference computational molecule. Do the same analysis using the partitionings given bellow.



(a) cubes (b) beams (c) slices (d) molecule