

Some preliminary results:

All these were calculated under the same conditions.

With 8 countries, initial population distribution:

Country 1 : 2004.0
Country 2 : 2019.0
Country 3 : 2037.0
Country 4 : 1891.0
Country 5 : 2023.0
Country 6 : 2035.0
Country 7 : 1994.0
Country 8 : 2035.0

Populations after 100 iterations of migration only:

Country 1 : 2090.0
Country 2 : 1897.0
Country 3 : 2052.0
Country 4 : 1911.0
Country 5 : 2121.0
Country 6 : 2053.0
Country 7 : 1914.0
Country 8 : 2000.0
Change: [86. -122. 15. 20. 98. 18. -80. -35.]
Total change: $86-122+15+20+98+18-80-35 = 0$ as expected.

Population after 100 iterations of birth/death only:

Country 1 : 1836.0
Country 2 : 1374.0
Country 3 : 2288.0
Country 4 : 2730.0
Country 5 : 2800.0
Country 6 : 4139.0
Country 7 : 1545.0
Country 8 : 3360.0
Change: [-168. -645. 251. 839. 777. 2104. -449. 1325.]
Total change: +4034

Population after 100 iterations of birth/death and migration:

Country 1 : 1821.0
Country 2 : 1324.0
Country 3 : 2330.0
Country 4 : 2776.0
Country 5 : 2819.0
Country 6 : 4169.0
Country 7 : 1485.0
Country 8 : 3276.0
Change: [-183. -695. 293. 885. 796. 2134. -509. 1241.]
Total change: +3692

As expected, there should be slight differences because of the change in the populations of each cell.

For more thorough trends, we will play with the parameters and migration function. We will also extract some more statistics.