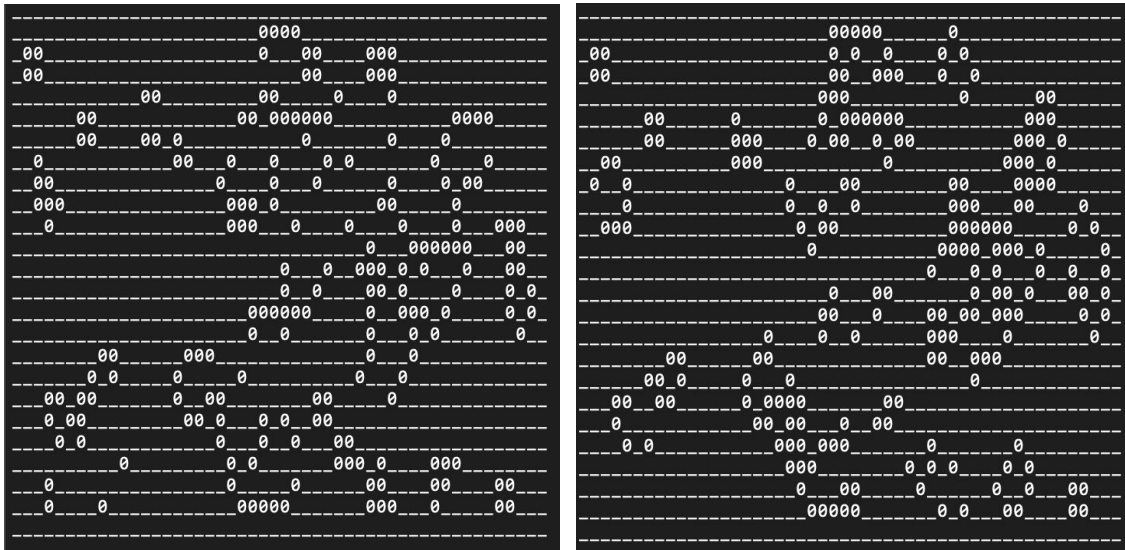# Assignment A: Game of Life

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Correctness

Two consecutive states

Implementation

Three functions (simpleSeq, golthread, golomp) implement sequential computation, parallel version using C++ thread only and parallel function version using OpenMP library, respectively. In the main function, all three functions are called to run and compare the correctness and also the running time.

Running time, speed up and scalability
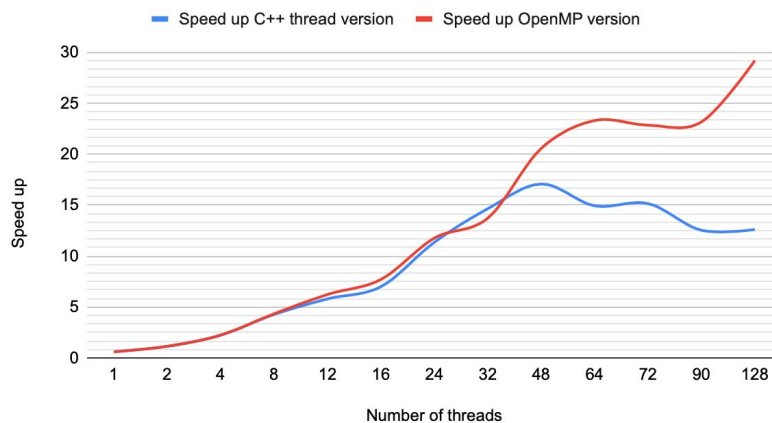
Running time

The following table shows the average running time of an iteration for each version on a map with size 11317*12331 on the machine XEON PHI.

Number of threads	Sequential	C++ thread version	OpenMP version
1	1597825	2655731	2655287
2	1655945	1405753	1399539
4	1597359	715903	708909
8	1591486	373452	367573
12	1592621	274896	255655
16	1660395	227277	206453
24	1601576	140292	135384
32	1591346	108674	115940
48	1596831	93244	77443
64	1602130	106567	68303
72	1599331	105090	69664
90	1593444	127003	68695
128	1591376	126241	54509

Speed up

Speed up = $T(sep)/T(nw)$

Speed up vs. Number of threads

Scalability

Scalability = $T(1)/T(nw)$

Scalability vs Number of threads