EXERCISE 2) CONWAY'S GAME OF LIFE

VARIANT A: REGULAR PARALLELISM:

We will explain our solution for this problem on a little example.

Let's say we have the following initial Matrix:

1	1	1	0	0	1	1	0	1
0	0	1	0	0	0	1	0	0

STEP 1)

And we would have three processes; the data would be split into three parts plus the border column:

Process 0:

1	1	1	0
0	0	1	0

Process 1:

1	0	0	1	1
1	0	0	0	1

Process 2:

1	1	0	1
0	1	0	0

So, every process will operate on a sub matrix plus an overlapping column (marked blue) to its neighbor(s). The blue marked column will only be used to transform the white fields to the new stage.

STEP 2)

When we now apply the rules of Conway's Game of Life to each sub matrix we will get for:

Process 0:

0	1	1
0	0	1

Process 1:

0	0	1
0	0	1

Process 2:

1	1	0
1	1	0

STEP 3)

In the last step we will send the border column of each sub matrix to the neighbor(s) (marked red):

Process 0:

0	1	1
0	0	1

The marked column will be send to process 1.

Process 1:

0	0	1
0	0	1

The left marked column will be send to process 0 and the right marked column to process 2.

Process 2:

1	1	0
1	1	0

The marked column will be send to process 1.

Now we have the same situation as in step 1) and we can start over.