Cellular Automaton

This is a **challenge** exercise. It is **not compulsory**, and may be completed **individually or with your lab partner**.

For this activity, you will need to complete a program called `cellular.c`.

Download `cellular.c`, or copy it into your current directory on a CSE system by running

```
$ cp /web/cs1511/17s2/week05/files/cellular.c .
```

This program is a simple life simulator. It is an example of a 1-dimensional cellular automaton. In this simulation, the world is represented by an array. Each element of the array is a single *cell* which can contain up to 1 creature. If it contains a creature, we call it `ALIVE`. If it contains no creatures, we call it `DEAD`.

The simulation will advance between *generations*. Every time it moves to a new *generation* each cell may

- become `ALIVE`,
- become `DEAD`,
- stay `ALIVE`, or
- stay `DEAD`.

Your task is to complete the function `nextGeneration`, which takes in an array of the current *generation* and the next *generation*, and sets all of the values of the cells in the next *generation*. Currently, this function makes every generation the same.

The rules for what happens on each *generation* are:

- If a cell in the current generation is `DEAD`, then in the next generation
  - it becomes `ALIVE` if it is next to one or two `ALIVE` cells, otherwise
  - it remains `DEAD`.
- If a cell in the current generation is `ALIVE`, then in the next generation
  - it remains `ALIVE` if it is next to exactly one `ALIVE` cell, otherwise
  - it becomes `DEAD`.
- The first cell in the array and the last cell in the array are next to each other.

There are no tests for this activity, so feel free to have some fun. Try and see what happens to the output if you change the rules.

To run Styl-o-matic:

```
$ 1511 stylomatic cellular.c
Looks good!
```

You'll get advice if you need to make changes to your code.

Submit your work with the *give* command, like so:

```
$ give cs1511 wk05_cellular
```

Or, if you are working from home, upload the relevant file(s) to the `wk05_cellular` activity on Give Online.