Practice Problem: Array Flattening

Tags: Lab4, Lab5, loops, arrays

In this problem, you will write a class called ArrayFlattener which has a useful tool for array manipulation. The Array Flattener works like this:

When you “Flatten” an array, every number becomes the median number of it + its closest neighbors. The first and last numbers are considered neighbors. So an array that once looked like this:

1 2 5 3 7 4 8 9 5 3 6 3

will after flattening become

2 2 3 5 4 7 8 8 5 5 3 3.

For a more in-depth explanation, the array

1 2 4 3

will become

2 2 3 2. The first element had neighbors 2 and 3 and was 1, and became 2 because 2 is the median of those numbers. The next element was picking from 1, 2, and 4, and became 2. The next was picking from 2, 4, and 3, and became 3. The next picked from 3, 1, and 2, and became 2.

Note that all the numbers are updated “simultaneously”: the updates of one number don’t affect the updates of the other numbers.

Write a class ArrayFlattener that has a method
public void flatten(int[] array)
which does this to the array you pass in. Note that you are not returning a new array: you are modifying the one that was given as an argument. Be careful about how your loops work. Assume the array has at least 3 elements.

If you want to practice coding your own stuff, you should write this class file from scratch. If you want to practice coding on an exam, fill in the following class and method so that it works as expected.

SPOILERS DO NOT LOOK IF YOU ARE WRITING FROM SCRATCH

```
public class ArrayFlattener {

	private int median(int a, int b, int c) {
		if _____________________________________ {
			return b;
		}
		return median(_________);
	}

	public void flatten(int[] a) {

		int[] copy = new int[a.length];
		for (int i = 0; i < a.length; i++) {
			copy[i] = a[i];
		}

		a[0] = median(copy[0], copy[a.length - 1], copy[1]);
		a[a.length - 1] = _____________________________;
		for (_________; ___________; __________) {
			a[i] = _____________________________;
		}


	}

}
```