Data Structures - Quiz - 9

Question: Here you'll implement a method that will be useful for a sorting algorithm we'll look at later in this class.

Write a method:

```
public static int[][] splitByPivot(int[] array, int pivot)
```

that returns two integer arrays: one containing all elements in `array` smaller than `pivot`, and one containing all elements in `array` larger than `pivot`. The method doesn't have to be optimally efficient, but it should run in $O(n)$ where n is the size of the array.

Bonus (up to 4 points): Describe how to sort an array by iteratively using `splitByPivot`. More correct details = more points! Maybe draw a diagram.

Solution:

```
public static int[][] splitByPivot(int[] array, int pivot){
    int counter = 0;
    for(int i = 0; i < array.length; i++) {
        if(array[i] < pivot) { counter ++; }
    }
    int[] smaller = new int[counter];
    int[] larger = new int[array.length - counter - 1];
    int index1 = 0;
    int index2 = 0;
    for(int i = 0; i < array.length; i++) {
        if(array[i] < pivot) {
            smaller[index1] = array[i];
            index1++;
        } else if(array[i] > pivot) {
            larger[index2] = array[i];
            index2++;
        }
    }
    return new int[][] {smaller, larger};
```