Exercise 1. Consider an array `a` of n (> 1) integers.

a. Provide an algorithm for computing the mode (value that occurs most frequently) of the array. For example, the mode of the array `a = {1, 3, 1, 1, 5, 5, 3}` is 1.

b. What is the running time $T(n)$ of your algorithm?

Solutions

Solution 1.

a.

```
public static int mode(int[] a) {
    int mode = a[0];
    int freq = 0;
    int maxFreq = 1;
    Arrays.sort(a);
    for (int i = 1; i < a.length; i++) {
        if (a[i] == a[i - 1]) {
            freq += 1;
        } else {
            if (freq > maxFreq) {
                maxFreq = freq;
                mode = a[i];
            }
            freq = 0;
        }
    }
    return mode;
}
```

b. $T(n) = n \log n$