This is an ungraded exercise, but it counts towards your participation. We’ll pick some representative papers among your solutions to go over in the writing workshop in Wednesday 9/14/2022. Please upload your solution to Canvas by midnight of Tuesday 9/13/2022. Note that you should work individually for this exercise, and your paper should be anonymous so that it can be shown to your classmates.

1. (10 points) You are given an (unsorted) array \(A[1 : n]\) of distinct elements. A local minimum of the array is an element that are smaller than the adjacent elements. (Still, boundary elements \(A[1]\) and \(A[n]\) only need to be smaller than the only adjacent element.) Find a local minimum using \(O(\log(n))\) time; if there are many local minimum, you only need to return one. You should give a (very high-level) pseudo-code and an informal description of your algorithm, and a brief justification of its correctness.