CIS 4930 – Problem Solving

Exercise 1 : Deadline Tuesday 1/27/2026

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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 Thursday 1/29/2026. Please upload your solution to Canvas by midnight of Tuesday 1/27/2026. Note that 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.