

3. This summer, you plan to take a road trip from Los Angeles to Boston. Your car can go p miles when the tank is full, and you have a map that indicates the distances between gas stations along the route. You are given $d_1 < d_2 < \dots < d_n$, where d_i is the distance from Los Angeles to the i th gas station. You may assume that the distance between neighboring gas stations is at most p miles.

You want to drop by as few gas stops as possible. Give a greedy algorithm to determine which gas stations you should stop at, and prove that your strategy yields an optimal solution.