

Hand in your solutions electronically using CMS and submit a paper copy in class. Write your name and NetID on the first page.

Remember that when a problem asks you to design an algorithm, you must also prove the algorithm's correctness and analyze its running time. The running time must be bounded by a polynomial function of the input size, unless specified otherwise.

1. [10 points] Problem 5.1 from the text.
2. [10 points] Problem 5.3 from the text.
3. [10 points] Design a $o(n^2)$ -time (i.e., subquadratic) algorithm that finds the maximum product of any contiguous subsequence of a given sequence of n rational numbers a_1, \dots, a_n . The empty set is a valid subsequence, whose product is 1. You should assume that the basic operations (addition, subtraction, multiplication, division, and comparison) on two rational numbers are performed in $O(1)$ time.

Example. The solution for $[\frac{1}{2}, \frac{1}{3}, \frac{1}{4}]$ is 1; the solution for $[3, 0, -2, -2]$ is 4.