

Homework 7, Due Thursday October 28

1. Problem 16-4, page 326.
2. Exercise 17.2-4, page 337.

Note: make sure that you also state and justify the running times of your algorithm.

3. Consider the following modification to Exercise 17.2-4.

In this problem, Professor Midas is not only given the location of each gas station along Interstate 80. He is also given the price per gallon of gas at each gas station. His new goal is to minimize the cost of gasoline for the trip rather than the number of stops.

- (a) Show that the greedy algorithm for Exercise 17.2-4 does not work (i.e., give a counterexample).
- (b) Give a dynamic programming solution to the problem, argue that your algorithm is correct, then state and justify the running time of your algorithm.

Homework 8, Due Thursday November 4

1. Exercise 16.3-5, page 319.
2. Problem 17-1, page 353.
3. Consider the following table for the operation \star on the symbols a , b and c .

\star	a	b	c
a	b	b	a
b	c	b	a
c	a	c	c

According to this table, $a \star b = b$ and $b \star a = c$. Note that \star is neither commutative nor associative.

Devise an algorithm which given a list of symbols x_1, \dots, x_n such that each $x_i \in \{a, b, c\}$, determines whether it is possible to parenthesize $x_1 \star x_2 \star \dots \star x_n$ in such a way that the resulting expression evaluates to a . If so, your algorithm should also produce such a parenthesization.

For example, for $b \star b \star b \star b \star a$, your algorithm should return “yes” because $((b \star (b \star b)) \star (b \star a)) = a$. Note that the solution does not have to be unique. For example, $(b \star (b \star (b \star (b \star a))))$ is also equal to a .

Remember to argue that your algorithm is correct and to state and justify the running time of your algorithm. For full credit, your algorithm must be reasonably fast.