uc3m | Universidad Carlos III de Madrid

Data Structures and Algorithms.
Author: Isabel Segura Bedmar

Unit 4 – Recursion

Problem 1: Write a recursive method for finding the minimum element in a list of integers.

Problem 2: Write a recursive method that determines if a string s is a palindrome, that is, it is equal to its reverse. For example, racecar and gohangasalamiimalasagnahog are palindromes.

Problem 3: Write a recursive method that takes an integer and returns the sum of its digits (for example, for n=2356, the method should return 2+3+5+6=16). Hint: 2356/10=235, 235/10=23, 23/10=2.

Problem 4: Write a recursive method that takes a list of integers and checks if the list is sorted (ascending order). For example if a=[3,4,5,2], checkSort(a)=False, a=[3,4,5,7], checkSort(a)=True

Problem 5: Write a recursive method that takes two integers x and y and returns x times y by using the russian method. This russian method consists of :

1) Make two columns. Write the largest number in the first column, and the smallest in the second.

2) In the first column, divide the number by 2 repeatedly until to get to 1. In the second column, multiply the number by 2 until you have the same rows than in the first column.

3) Cross out the rows whose value in the first column is an even number (x % 2==0)

4) Add the values in the second columns. The result is the answer.

For example, 17*100=1700

17	100
8	200
4	400
2	800
1	1600

=1700