

212 (next sorted list) Given a nonempty sorted list of naturals, write a program to find the next (in list order) sorted list having the same length and sum.

After trying the question, scroll down to the solution.

§ Here are 3 lists of length 5 that add up to 6, and below them are the lists that come next in list order, with the same length and sum.

[1; 2; 0; 1; 2] [1; 2; 3; 0; 0] [6; 0; 0; 0; 0]

[1; 2; 0; 2; 1] [1; 3; 0; 0; 2] none

We'll have to decide what happens if we are given the last list, or perhaps we don't care what happens in this case, and we have to say so (for implementability). From the example lists, the strategy appears to be the following. If the last item is not 0, subtract 1 from the last item and add 1 to the item before last. If the last item is 0, reduce the last nonzero item to 0, add 1 to the item before it, and the remainder becomes the last item. If we are given the last list, there is no item before the last nonzero item, so we are stuck. UNFINISHED