Reportedly, there was an interview from the Microsoft VP to some students of Beijing University and Tsinghua University last year, which was shown on the CCTV.

One question from the Microsoft VP was the following:

Suppose you have 1000 apples and 10 empty boxes. How do you allocate these apples into the boxes, so that for any number given from 1 to 1000, you can always find a suitable combination of the boxes such that the sum of the apples inside these boxes exactly equals to that given number?

(For example, if you allocate 1 apple in each box, then you can only represent all the numbers from 1 to 10, since you only have 10 boxes; if you allocate 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 apples into the 10 boxes, then you can only represent all numbers 1, 2, …, up to 55, but then you have no more boxes for the rest numbers from 56 to 1000).

Do you have an answer for the Microsoft VP?

Furthermore, if you are given 10,000 apples, 100,000 apples, … , and so on, (with more boxes, of course), do you have a universal solution for all such problems?

If you really really really cannot find the answer, I may tell you later.

☺ **GRC**
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