Problem E: Falling Into Place

> One good thing about urgent matters is that if you wait long enough, they are not urgent anymore.
>
> attributed to Amos Tversky, from *The Undoing Project* by M. Lewis

Everything will eventually fall into place, we like to say. Now, what about sorting integers with this approach? Say, we are given an array of n integers (just a permutation of the first n integers, for now), and we are allowed to perform the following *round*: we can keep certain entries attached to their places, while the others randomly permute with each other. We assume that if we keep k entries, then for the the remaining $n - k$ entries all the $(n - k)!$ permutations are equally likely. Now, depending on the outcome of a round, we can decide which numbers to keep attached in the next round, and so on. What is the expected number of rounds before the integers fall into their respective order, i.e. $1, 2, \ldots, n$?

Input

The first line contains integer T, the number of test cases. Each of the following T blocks contain $n \leq 1000$ followed by a permutation of the first n positive integers.

Output

For each test case, output `Case x: y`, where x is the number of the test case, and y is the expected number of rounds for the permutation to become ordered. The number y must be written with 6 digits after the decimal point.

Sample Input	*Sample Output*
`4`	`Case 1: 2.000000`
`4`	`Case 2: 3.000000`
`1 3 2 4`	`Case 3: 3.000000`
`4`	`Case 4: 2.000000`
`1 3 4 2`	
`4`	
`1 4 2 3`	
`4`	
`1 4 3 2`	