1189 – Sum of Factorials

Given an integer **n**, you have to find whether it can be expressed as summation of factorials. For given **n**, you have to report a solution such that

$$n = x_1! + x_2! + \ldots + x_n! \ (x_i < x_j \text{ for all } i < j)$$

Input

Input starts with an integer **T (≤ 10000)**, denoting the number of test cases.

Each case starts with a line containing an integer **n** $(1 \le n \le 10^{18})$.

Output

For each case, print the case number and the solution in summation of factorial form. If there is no solution then print **'impossible'**. There can be multiple solutions, any valid one will do. See the samples for exact formatting.

Sample Input	Output for Sample Input
4 7 7 9 11	Case 1: 1!+3! Case 2: 0!+3! Case 3: 1!+2!+3! Case 4: impossible

Note

Be careful about the output format; you may get wrong answer for wrong output format.