

Problem H

Morning Walk!

Input: Standard Input
Output: Standard Output

Many people walks in the morning to keep fit. But morning walks can be strange for people who knows mathematics pretty well. That is what has happened to Peter who loves mathematics and loves to walk in the morning.

Peter starts walking from a fixed point M. He walks s_1 steps towards a certain direction, turns left or right and then walks s_2 steps to reach another place N. At N he turns left or right and walks s_3 steps in a straight line and then turns left or right and walks s_4 steps in that direction and reaches another place P. At P he turns left or right walks s_5 steps in the same direction and then turns left or right and then he again walks s_6 steps to reach point M from where he started walking. The next morning Peter decides to walks less, so from M he walks at the direction of N and after exactly s_7 steps he reaches N. From N he walks towards the direction P and after s_8 steps he reaches point P and from P he walks towards point M. After walking exactly s_9 steps he reaches point M again.

But after walking he becomes very exhausted and forgets his walking directions or the location of N and Q. He only remembers that he has walked total S steps on the second morning. For simplification you can assume the following things:

- (a) At each step Peter covers exactly the same distance.
- (b) If peter turns left or right is walking direction changes exactly 90 degree.
- (c) While turning only the direction of Peter changes, his position remains the same. Turning left or right is not considered as a step.
- (d) For the first morning assume that $s_1, s_2, s_3, s_4, s_5, s_6 \geq 0$. Also assume that M, N and P are three different point and not collinear.

Given the value of S, your job is to find possible values of s_7, s_8 and s_9 .

Input

Input file contains at most 125 lines of inputs. Each line contains an integer S ($0 < S \leq 80000$). Input is terminated by a line containing a single zero, which should not be processed.

Output

For each line of input produce two or more line of output. The first line should contain the serial of output. The next lines should contain possible values of s_7, s_8 and s_9 . Please note than you should print only those solutions where $s_7 \leq s_8 \leq s_9$. If there is more than one solution then print them in the ascending order of s_7 . If there is still a tie then print in the ascending order of S. If no valid values of s_7, s_8 and s_9 is found print the line "Peter has Forgotten Everything" instead. Look at the output for sample input for details.

Sample Input

Output for Sample Input

10	Case 1:
12	Peter has Forgotten Everything
13	Case 2:
100	3 4 5
50002	Case 3:

0	Peter has Forgotten Everything Case 4: 17 39 44 18 41 41 26 26 48 29 29 42 32 34 34 Case 5: 5435 22126 22441 8696 17225 24081 12926 14249 22827 16305 16376 17321
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