Siena College's 32nd Annual High School Programming Contest
Sponsored by Transfinder
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Gold Problem #2: Are You HAPPY and Do You Know It?

Background Information: If you start with a number and continuously replace the number with the sum of the squares of its digits until you get a result of 1 then you have found a HAPPY number 🙂 For example, with 28 as the starting number the sequence 28, 68, 100, 1 will be generated in three steps.

Note that the process can continue forever but when 1 is reached, the sequence will stay at 1.

Interestingly, if the number you start with does not reach 1 then it will reach 89 and once you reach 89 there will be in an infinite cycle of 89, 125, 30, 9. 81, 65, 61, 37, 58, and back to 89. Starting numbers that do not reach 1 are called SAD numbers 😟

Programming Problem:

Input:	N, a positive integer with N < 1,000,000.
Output:	1 or 89 followed by S which is the number of steps to reach 1 or 89. The two output values must be separated by one space.

Example 1:	Input:	28
	Output:	1 3
Example 2:	Input:	85
	Output:	89 1
Example 3:	Input:	89
	Output:	89 0
Example 4:	Input:	145
	Output:	89 7
Example 5:	Input:	923
	Output:	1 5