Problem C	Happy Number
Time Limit	1 Second

Let the sum of the square of the digits of a positive integer S_0 be represented by S_1. In a similar way, let the sum of the squares of the digits of S_1 be represented by S_2 and so on. If $S_i = 1$ for some $i \geq 1$, then the original integer S_0 is said to be Happy number. A number, which is not happy, is called Unhappy number. For example 7 is a Happy number since 7 -> 49 -> 97 -> 130 -> 10 -> 1 and 4 is an Unhappy number since 4 -> 16 -> 37 -> 58 -> 89 -> 145 -> 42 -> 20 -> 4.

Input

The input consists of several test cases, the number of which you are given in the first line of the input. Each test case consists of one line containing a single positive integer **N** smaller than 10^9.

Output

For each test case, you must print one of the following messages:

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Case #p: N is a Happy number.
Case #p: N is an Unhappy number.
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Here **p** stands for the case number (starting from 1). You should print the first message if the number **N** is a happy number. Otherwise, print the second line.

Sample Input	Output for Sample Input
3 7 4 13	Case #1: 7 is a Happy number. Case #2: 4 is an Unhappy number. Case #3: 13 is a Happy number.

Problemsetter: Mohammed Shamsul Alam
International Islamic University Chittagong
Special thanks to Muhammad Abul Hasan