Enigmath Machine (enigmath)

Giorgio has to send a new task proposal to William for the next round of the OIS. Since he needs to be extra careful to avoid information leaks, he decided to use cryptography to protect the transfer of information. Inspired by the *Enigma* machine, popular during World War II, he decided to build his own version: the *Enigmath* machine!

To start, he has already decided the *encoding* algorithm. Starting with a number N (e.g., $N = 29$), he computes the sum $s(N)$ of the digits of N (e.g., $s(29) = 2 + 9 = 11$), and then the sum $s(s(N))$ of the digits of the sum of the digits of N ($s(s(29)) = s(11) = 1 + 1 = 2$), and so on until he obtains a single digit. The encoded number E is then the sum of all the numbers generated this way:

$$E = N + s(N) + s(s(N)) + \dots$$

For example, if $N = 29$, then $E = 29 + 11 + 2 = 42$.

Of course, for the encoding to be useful, it is necessary to design a corresponding *decoding* algorithm. Help Giorgio by writing a program that given E, determines which N could have produced it, if it exists and is unique.

Figure 1: 4-rotor naval Enigma machine.

☞ Among the attachments of this task you may find a template file `enigmath.*` with a sample incomplete implementation.

Input

The first and only line contains two integers E_{min} and E_{max}.

Output

You need to write a line for each number E between E_{min} and E_{max}, each of them containing:

- the string `IMPOSSIBLE` if no decodings exist for E;
- the string `AMBIGUOUS` if multiple possible decodings exist for E;
- the unique decoding of E otherwise.

Constraints

- $0 \leq E_{\text{min}} \leq E_{\text{max}} \leq 10^9$.
- $E_{\text{max}} - E_{\text{min}} \leq 10^6$.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

– **Subtask 1** (0 points) Examples.

– **Subtask 2** (30 points) $E_{\min} = E_{\max}$ and the decoding exists and is unique.

– **Subtask 3** (30 points) $E_{\max} \leq 1000$.

– **Subtask 4** (20 points) $E_{\max} - E_{\min} \leq 1000$.

– **Subtask 5** (20 points) No additional limitations.

Examples

input	output
42 42	29
30 32	AMBIGUOUS IMPOSSIBLE 25
9 10	9 IMPOSSIBLE

Explanation

The **first sample case** is explained in the problem statement.

In the **second sample case**, 30 can be the encoding of both 19 and 24; while 32 is the encoding of 25. Since numbers below 24 encode to at most 30, and numbers above 25 encode to at least 32, 31 is not obtainable as the encoding of a number.

In the **third sample case**, 9 is the decoding of itself while 10 is not decodable.