I. Goofy Numbers

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

The non-negative integer a is a divisor of the non-negative integer b if and only if there exists a **positive** integer c such that $a \times c = b$.

Some numbers are really interesting. Commander Surena defines some interesting properties for non-negative integers:

- An integer is happy if it is divisible by at least one of its digits and not by all of them.
- An integer is happier if it is divisible by all of its digits.
- An integer is upset if it's divisible by none of its digits.

Surena asks you to find out if a given number is happy, happier or upset.

Input

Input contains a single non-negative integer n ($1 \leq n \leq 10^8$).

Output

Write on a single line the type of the integer: `happy`, `happier` or `upset`. Print the type in lowercase letters.

Examples

input
99
output
happier

input
29994
output
happy

input
23
output
upset

Note

In the second test 29994 is only divisible by 2.

In the third test 23 is a prime number.