Problem Description

In hexadecimal (base 16), the letters A through F are used to represent the hexadecimal digits 10 through 15. Extending this scheme, let G=-16, H=17, and so on through Z=35. Write a program to read *x*, *y* and *b* from the keyboard. Calculate exactly *x^y* base *b*, display the result, and loop to read another set of *x*,*y* and *b*. The integers *x* and *y* are in the range 0..35 and the integer *b* is in the range 2..35. (The program will be terminated by Control-C or Control-Break.)

Input

The keyboard input is three decimal integers: *x*, *y* and the desired base *b*, all on separate lines. *x* and *y* will not both be zero.

Output

Calculate *x^y* in the given base *b* and display it.

Sample Input:

```
3
3
16
```

Sample Output:

```
3 ^ 3 = 1B (base 16)
```

since 3 ^ 3 = 27 and 27 = 1B (base 16).