

Write a program to convert a whole number specified in any base (2..16) to a whole number in any other base (2..16). “Digits” above 9 are represented by single capital letters; e.g. 10 by A, 15 by F, etc.

Input

Each input line will consist of three values. The first value will be a positive integer indicating the base of the number. The second value is a positive integer indicating the base we wish to convert to. The third value is the actual number (in the first base) that we wish to convert. This number will have letters representing any digits higher than 9 and may contain invalid “digits”. It will not exceed 10 characters. Each of the input values on a single line will be separated by at least one space.

Output

Program output consists of the original number followed by the string ‘base’, followed by the original base number, followed by the string ‘=’ followed by the converted number followed by the string ‘base’ followed by the new base. If the original number is invalid, output the statement

original_Value is an illegal base *original_Base* number

where *original_Value* is replaced by the value to be converted and *original_Base* is replaced by the original base value.

Sample input

```
2 10 10101
5 3 126
15 11 A4C
```

Sample output

```
10101 base 2 = 21 base 10
126 is an illegal base 5 number
A4C base 15 = 1821 base 11
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