

# Uniform Generator

**Input File: uniform.in**  
**Output File: uniform.out**

Computer simulations often require random numbers. One way to generate pseudo-random numbers is via a function of the form

$$\text{seed}(x + 1) = [\text{seed}(x) + \text{STEP}] \% \text{MOD}$$
where “%” is the modulus operator.

Such a function will generate pseudo-random numbers (seed) between 0 and  $\text{MOD} - 1$ . One problem with functions of this form is that they will always generate the same pattern over and over. In order to minimize this effect, selecting the STEP and MOD values carefully can result in a uniform distribution of all values between (and including) 0 and  $\text{MOD} - 1$ .

For example, if  $\text{STEP} = 3$  and  $\text{MOD} = 5$ , the function will generate the series of pseudo-random numbers 0, 3, 1, 4, 2 in a repeating cycle. In this example, all of the numbers between and including 0 and  $\text{MOD} - 1$  will be generated every MOD iterations of the function. Note that by the nature of the function to generate the same  $\text{seed}(x + 1)$  every time  $\text{seed}(x)$  occurs means that if a function will generate all the numbers between 0 and  $\text{MOD} - 1$ , it will generate pseudo-random numbers uniformly with every MOD iterations.

If  $\text{STEP} = 15$  and  $\text{MOD} = 20$ , the function generates the series 0, 15, 10, 5 (or any other repeating series if the initial seed is other than 0). This is a poor selection of STEP and MOD because no initial seed will generate all of the numbers from 0 and  $\text{MOD} - 1$ .

Your program will determine if choices of STEP and MOD will generate a uniform distribution of pseudo-random numbers.

## Input

Each line of input will contain a pair of integers for STEP and MOD in that order ( $1 \leq \text{STEP}, \text{MOD} \leq 100000$ ).

## Output

For each line of input, your program should print the STEP value right-justified in columns 1 through 10, the MOD value right-justified in columns 11 through 20 and either “Good Choice” or “Bad Choice” left-justified starting in column 25. The “Good Choice” message should be printed when the selection of STEP and MOD will generate all the numbers between and including 0 and  $\text{MOD} - 1$  when MOD numbers are generated. Otherwise, your program should print the message “Bad Choice.” After each output test set, your program should print exactly one blank line.

### Sample Input

```
3 5
15 20
63923 99999
```

### Sample Output

3	5	Good Choice
15	20	Bad Choice
63923	99999	Good Choice