

# Consecutive Digits

As a recruiting ploy, Google once posted billboards in Harvard Square and in the Silicon Valley area just stating “{first 10-digit prime found in consecutive digits of e}.com”. In other words, find that 10-digit sequence and then connect to the web site — and find out that Google is trying to hire people who can solve a particular kind of problem.

Not to be outdone, Gaggle (a loopy-goopy fuzzy logic search firm), has devised its own recruiting problem. Consider the *base 7* expansion of a rational number. For example, the first few digits of the base 7 expansion of  $1/5_{10} = 0.12541\dots_7$ ,  $33/4_{10} = 11.15151\dots_7$ , and  $6/49_{10} = 0.06000\dots_7$ . From this expansion, find the digits in a particular range of positions to the right of the "decimal" point.

## Input

The input file begins with a line containing a single integer specifying the number of problem sets in the file. Each problem set is specified by four base 10 numbers on a single line,  $n\ d\ b\ e$ , where  $n$  and  $d$  are the numerator and denominator of the rational number and  $0 \leq n \leq 5,000$  and  $1 \leq d \leq 5,000$ .  $b$  and  $e$  are the beginning and ending positions for the desired range of digits, with  $0 \leq b, e \leq 250$  and  $0 \leq (e-b) \leq 20$ . Note that 0 is the position immediately to the right of the decimal point.

## Output

Each problem set will be numbered (beginning at one) and will generate a single line: Problem set  $k$ :  $n / d$ , base 7 digits  $b$  through  $e$ : result where  $k$  is replaced by the problem set number, result is your computed result, and the other values are the corresponding input values.

## Example

### Input:

```
4
1 5 0 0
6 49 1 3
33 4 2 7
511 977 122 126
```

### Output:

```
Problem set 1: 1 / 5, base 7 digits 0 through 0: 1
Problem set 2: 6 / 49, base 7 digits 1 through 3: 600
Problem set 3: 33 / 4, base 7 digits 2 through 7: 151515
Problem set 4: 511 / 977, base 7 digits 122 through 126: 12425
```