

Sort fractions

You are given a positive integer N . Let us consider set A of fractions x/y where $0 \leq x/y \leq 1$, $y \leq N$ and the maximum common divisor of x and y is 1.

For example $N = 5$. Set A in increasing order consists of elements $0/1$; $1/5$; $1/4$; $1/3$; $2/5$; $1/2$; $3/5$; $2/3$; $3/4$; $4/5$; $1/1$.

Your task is to find the i -th smallest fraction in set A .

Input

The first line of input contains the number of testcases t ($t \leq 15$). The first line of each testcase contains numbers N and M ($N \leq 5000$, $M \leq 10000$). The next M lines contain one question each.

Output

For each testcase, you should output M lines which are the answers to the M questions.

Example

Input:

```
1
5 4
1
3
5
8
```

Output:

```
0/1
1/4
2/5
2/3
```