

## Farey sequence

The Farey sequence of order **N** is the sequence of all irreducible fractions  $\frac{p}{q}$  with  $0 < p < q \leq N$ , arranged in increasing order. For instance, the Farey sequence of order **5** is:

$$\frac{1}{5} \quad \frac{1}{4} \quad \frac{1}{3} \quad \frac{2}{5} \quad \frac{1}{2} \quad \frac{3}{5} \quad \frac{2}{3} \quad \frac{3}{4} \quad \frac{4}{5}$$

We number all fractions in the sequence starting at **1**. For instance, the 6<sup>th</sup> fraction in the sequence of order **5** is  $\frac{3}{5}$ .

### Task

Given a number **N** and a number **K**, determine the **K**<sup>th</sup> fraction in the sequence of order **N**.

### Input data

(file: **farey.in**)

The input file consists of a single line, containing the integers **N** and **K** separated by a space. **K** will always be a valid index, i.e. it will be at least one and not greater than the number of fractions in the sequence of order **N**.

### Output data

(file: **farey.out**)

The output file should contain a single line, consisting of two integers **P** and **Q** separated by a space. The fraction  $\frac{p}{q}$  must be the **K**<sup>th</sup> fraction in the Farey sequence of order **N**. The fraction must be irreducible, i.e. the greatest common divisor of **P** and **Q** must be **1**.

### Constraints

- $1 < N \leq 40\,000$
- 40% of the test cases will have  $K \leq 50\,000$
- all test cases will have  $N \geq 10\,000$

### Example

<b>farey.in</b>	<b>farey.out</b>
5 6	3 5

**Time limit:** 0.3 seconds/test

**Parental advice:** this is not a Math problem; it only requires elementary mathematical knowledge. What it does require is a smart algorithm.