

## Assignment 4: Recursion

From Wikipedia<sup>1</sup>:

"According to the fundamental theorem of arithmetic, every integer greater than 1 either is prime itself or is the product of prime numbers, and that, although the order of the primes in the second case is arbitrary, the primes themselves are not."

For example,

$1200 = 24 \times 31 \times 52 = 3 \times 2 \times 2 \times 2 \times 5 \times 5 = 5 \times 2 \times 3 \times 2 \times 5 \times 2 \times 2 = \text{etc.}$

A series of numbers without repetition is a series in which each number appears exactly once.

For example, for 1200, the series of prime factors without repetition will be: 2, 3, 5.

Write a recursive function which gets as input positive integer number and prints the series of its prime factors without repetition.

Function signature: `void factor_rec(int num)`

Guidelines:

1. The smallest known divisor of a number (greater than 1) is one of its prime factors.
2. First find the smallest divisor of the number and print it.
3. Now, think what remains to be done, how to set it recursively, and when the process ends (what is the termination condition of the recursion).

Write a program which gets as input from the user positive integer value and prints its prime factors by calling `factor_rec`.

Example (program in **blue**, user in **red**):

```
Please enter a positive integer:
168
The prime factors of 168 are 2 3 7
```

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<sup>1</sup> [http://en.wikipedia.org/wiki/Fundamental\\_theorem\\_of\\_arithmetic](http://en.wikipedia.org/wiki/Fundamental_theorem_of_arithmetic)