# A task for candidates for backend developer (C#).

## Prerequisites

The task is intended to check your knowledge and programming skills. Please note that if you managed to make things work, it wouldn't automatically mean successful task completion. We will evaluate your architectural skills, programming style, and knowledge of performance optimization.

It is great if you are familiar with compiler programming, data structures, algorithms to work with expressions, syntax trees, and parsing.

## Description

You need to build a library that will be able to calculate simple expressions like addition, subtraction, and multiplication with Roman numbers.

The library should have a simple method:

public string Evaluate(string input);

Sample of usage:

var result = calculator.Evaluate("(MMMDCCXXIV - MMCCXXIX) \* II");

Console.WriteLine(result);

***MMCMXC***

## Advice

We would like to evaluate your ability to work with parsing and manipulating expression trees. In this way, we recommend splitting the task into a few stages: parsing, building expressions tree, traversing tree and evaluation expression. We recommend using some of the monadic parsers combinators library to complete the parsing stage, but you can do it manually or use any parser generator. However, in other stages, it's recommended to write code from scratch.

It would be great if you keep in mind performance-related terms like memory allocation, garbage collection pressure and algorithm complexity.

## Results

Send results to [recruitment@plumsail.com](mailto:recruitment@plumsail.com) with the link to your HH resume.

## Deadlines

There is no strict deadline. We understand that you may be working on another job. It would be great if you could complete it in a week.