Programming languages (TC-2006)

Homework 13

In this homework, you will practice what you know from the Erlang language. Please consider that the purpose of this homework is to allow you to practice and identify strengths and weaknesses. Then, implement these functions as requested and avoid using any built-in functions that already do what you are requested to implement. However, feel free to solve these problems with higher-order functions if that helps.

1 `index` (10%)

Write a function in Erlang that returns the position of an element in a list. For simplicity, assume that the element to find is always present in the list.

2 `firstn` (10%)

Write a function in Erlang that returns the first n elements from a list.

3 `lastn` (10%)

Write a function in Erlang that returns the last n elements from a list.

4 `sum` (10%)

Prepare a function in Erlang that sums all the elements in a list (including nested lists).

5 `even` (15%)

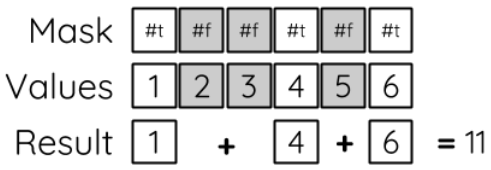
Propose a function in Erlang that extracts all the even numbers in a list. For simplicity, the lists provided as input contain only numbers (there are no nested lists).

6 `reverse` (15%)

Provide a function in Erlang that reverses a list and all of its nested lists. Please consider that the structure of the nested lists must be preserved in the answer. Then, if a list contains a list, the result must be a list with one list, but the elements inside the nested list must also be reversed.

7 `maskedsum` (15%)

Write a function in Erlang that receives two lists of the same length, one of numbers and the other one of booleans (there is no need for additional verifications). The function must sum all the elements that correspond to true values in the list of booleans. A graphical representation of this example is depicted as follows:



8 `evaluate` (15%)

Write a function in Erlang that evaluates polynomials in the form $a_n x^n + a_{n-1}^{x-1} + \ldots + a_2 x^2 + a_1 x + a_0$, where $a_0, \ldots, a_n$ are constants and x is a variable.

Deliverables

Prepare an ERL file that contains the functions requested (in its corresponding module) and submit it to Canvas. **Please, do not submit other formats but ERL**. To prepare your ERL file, use the code template distributed along with this document. The template contains some test cases for each function to help you verify that your codes work as requested.

I promise to apply my knowledge, strive for its development, and not use unauthorized or illegal means to complete this activity, following the Tecnológico de Monterrey Student Code of Honor.