Exercises for the Course

Logic Programming Engineering

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Practical 5

Lists, Recursion IV

Exercise 5.0

Continue exercise 4.3.

Exercise 5.1

Write a program which converts a string of Roman numerals (see exercise 4.3) into a decimal number with the same value.

a) Assume that the input string of Roman numerals is correct.

b) Check the correctness of input string by using the predicate $roman(N, R)$ from exercise 4.3. If the input string is incorrect then give answer No.

Examples for incorrect input strings: 'MCMCM', 'IXIV', 'VIIII'.

Hints for realization in Prolog:

Define a predicate $arabic(R, N)$ which for a given atom R in roman numeral system converts its value into a decimal number N. For converting, define an auxiliary predicate $digital(R, RL, NL, N)$ which converts the atom R into the number N using a convertion table which is encoded as lists RL and NL in analogy to exercise 4.3. For atom manipulation use the built-in predicate $atom\_concat$.

Example: $? - arabic('MCMXCIX', N)$. should yield $N = 1999$
because 'MCMXCIX' = 'M' + 'CM' + 'XC' + 'IX' and $1999 = 1000 + 900 + 90 + 9$.

Exercise 5.2

Write a predicate $del1elem(Elem, L, RL)$ which deletes the first occurence of element $Elem$ in list L and returns reduced list RL.

Example: $? - del1elem(3, [0, 3, 4, 3, 8], RL)$. yields $RL = [0, 4, 3, 8]$.

Exercise 5.3

Write a predicate $convert(E, EL, DL, D)$ which converts element E into D with the help of the conversion table which is encoded as lists EL and DL. E is an element of list EL and D is an element of list DL.

Example: $? - convert(b, [a, b, c], [4, 6, 7], D)$. yields $D = 6$.