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

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

Exercise 5.2
Write a predicate $\text{del1elem}(Elem, L, RL)$ which deletes the first occurrence of element $Elem$ in list $L$ and returns reduced list $RL$.

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

Exercise 5.3
Write a predicate $\text{convert}(E, EL, DL, D)$ 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: $? - \text{convert}(b, [a, b, c], [4, 6, 7], D)$. yields $D = 6$. 