Mini-Project Nº 1

André Oliveira - 93686 - 50%
Maria Beatriz Venceslau - 93734 - 50%

mm2mmm - We started by reading 0 or 1 so we can differentiate from 01 and 11, 02 and 12. And then we read the next number, obtaining the month.

d2dd - Has a path that only accepts numbers with 1 digit and another that accepts the rest.

d2dddd - Has a path that only accepts numbers with 1 digit, one that only accepts numbers with 2 digits, one that only accepts numbers with 3 digits and another that accepts the rest.

copy - We copy all the numbers and the "/" so we did paths that would read each of these symbols and write the same one.

skip - The idea is the same as in copy, but we write eps instead of writing the same symbol.

date2year - Concatenated 6 skips (to ignore DD/MM/) and 4 copies (to copy YYYY).

leap - To find a leap year, we first have to check if it is divisible by 4, and if so, if it ends in 00 it must be divisible by 400. The only number finished by 00 is 2000 which is divisible by 400. So we can ignore the first 2 digits. To be a leap year, the number of tens is even, the units must be 0, 4 or 8, otherwise, the units must be 2 or 6.

R2A - We wanted to analyze the Roman number by parts. Each part would correspond to a digit of an Arabic number. For the first digit (the number of thousands), the only symbol that is valid is M, so we can make 3 combinations, M, MM or MMM (1, 2 or 3 respectively). If we can't find any of these symbols, it means that we have a number smaller than 1000. The next digit (the number of hundreds) can have the symbols C, D and M (only in the combination CM). Here, we have several combinations that result in a number from 1 to 9. If none of these symbols can be found, we go to the next digit. In the number of tens, we can find the symbols X, L and C (only in the combination XC). Again, we have combinations from 1 to 9 and if none of these symbols is found, we skip to the number of units. In this last digit, we can find the symbols I, V and X (only in the combination IX). Again, we have a combination that will result in a digit from 1 to 9.

A2R - Since the A2R is the opposite of R2A we can invert the input and the output and get the transducer.

birthR2A - We need to compose the R2A with d2dd for the day and month and compose the R2A with d2dddd for the year. Then we have to concatenate these with copies in the middle.

birthA2T - We concatenated 3 copies (to copy DD/) with mm2mmm (MM) and then another 5 copies (to copy /YYYY).

birthT2R - For the day and year we needed to compose the inverse of d2dd and d2dddd (to remove leading zeros) with A2R. For the month we first had to use the inverse of mm2mmm and then compose with the transducer in the previous sentence. Then we have to concatenate these with copies in the middle to copy the bars.

birthR2L - We had to compose R2A with d2dd and after with 2 skips and concatenate with another skip (to skip DD/) and then repeat (to skip MM/). We had to compose R2A with d2dddd and then composed with leap.