First Mini-Project – Língua Natural

Description of the options taken:

From the first exercise, the first 5 transducers' implementation is a really straightforward one, so we are only going to explain our options in the **leap** transducer and the **R2A** transducer.

In the **leap** transducer we only analyze 4-digit numbers that start with "19" or "20". After that, we analyze the last 2 numbers and according to the rules for a year to be a leap, we decide which years are accepted as "leap" or "not-leap".

In the **R2A** transducer, we started with the smaller numbers and as the numbers increase, we use the previous states that are already defined. We started defining the rules for I and then for V, X, L, C, D and M.

For the second exercise, we started by analyzing the transducer that we should implement in order to think of a better option.

The transducer **A2R** is the inverse of the transducer **R2A** (the input tape of the **A2R** is the output tape of the **R2A** and vice-versa). So, we used the operation ***fstinvert*** in the transducer **R2A** and obtained the transducer **A2R**.

To build **birthR2A** we realized that we need to convert Roman numbers to Arabic numbers and then convert the days and the months to 2-digit numbers and the years to 4-digit numbers. To do this, we started by composing the **R2A** with the **d2dd** to convert the Roman number to an Arabic number with 2 digits (***fstcompose***: we used this operation because the output from **R2A** is the input of **d2dd**). We concatenated the resulting transducer with the **copy** one to copy the "/". We repeated the same process to deal with the months and the years (in the year's case, we composed **R2A** with **d2dddd** to obtain a 4-digit number: output from **R2A** is the input of **d2dddd**).

To build **birthA2T** we realized that we needed to **copy** all the digits until the month and then use the **mm2mmm** to replace the 2-digit Arabic number with the 3-letter month names. To summarize, we only did ***fstconcat*** between **copy** transducers and **mm2mmm** transducer.

Moving on to **birthT2R**, we understood that it consisted in the inverse of **birthA2T** and **birthR2A** together. This means that we used ***fstinvert*** in the transducers **birthA2T** and **birthR2A** and ***fstcompose*** in the result transducers.

In the last transducer (**birthR2L**), we understood that all we needed to do was convert the Roman birthdate to an Arabian birthdate and select the year from it. To do this, we composed **birthR2A** with **date2year** and composed the resulting transducer with the **leap** transducer (***fstcompose***).

Estimate of each element's contribution to the work:

The contribution of each element of the group was 50%. We opted to split the first exercise. One member did the transducers **mm2mmm**, **d2dddd**, **skip**, and **leap** and the other member did the transducers **d2dd**, **copy**, **date2year**, and **R2A**. Every time an element finished one of their transducers, the other element would review it by analyzing and testing it, respectively. After having all the transducers from the first exercise done, we decided to do the second exercise together. Each member gave opinions until we reached functional transducers. In the end, we both tested all the transducers to check if something was missing.

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