

# Natural Language

## MP1

Name	Number	Share	Justification
João Porto	ist189472	50%	Work distributed evenly. Both parties did the simpler transducers independently and composite transducers were made collaboratively.
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**d2dddd**: by attributing gradually increasing weights to epsilon transitions, we make sure that all added zeroes are included as early as possible, avoiding converting a number like 12 to 1020.

**date2year**: this transducer ignores all input, no matter how long, but the last 4 digits which are assumed to be the year.

**leap**: this transducer was intentionally designed as to fail on any year outside the range of 1901-2099 by only accepting “19” or “20” as the initial two symbols.

**R2A**: this transducer deals with the thousands, then the hundreds, then the tenths and then the rest. This pattern can be seen on the image representation of the transducer.

**A2R**: this transducer was obtained simply by exchanging **R2A** transducer’s input and output labels with *fstinvert*.

**birthR2A**: this transducer is composed mainly by two composite transducers: **R2A2dd** and **R2A2dddd** which are the result of composing **R2A** with **d2dd** or **d2dddd**, respectively. These composite transducers translate roman to arabic numerals and at the same time, prepend zeros to make sure the output is always either 2 or 4 digits long. The slash symbol “/” is copied with the **copy** transducer. The final result is a concatenation of **R2A2dd** + **copy** + **R2A2dd** + **copy** + **R2A2dddd**.

**birthA2T**: this transducer is a concatenation of two simple transducers: **copy** and **mm2mmm**. The final result is : 3\* **copy** + **mm2mmm** + 5\* **copy**.

**birthT2R**: this transducer was obtained by inverting **birthA2T** and **birthR2A** to **birthT2A** and **birthA2R**, respectively. The final transducer is a result of composing **birthT2A** with **birthA2R**.

**birthR2L**: this transducer was obtained by composing **birthR2A** with **date2year** and then with the **leap**. The first composition is a transducer that outputs the year in arabic numerals of a Roman birthdate. The second composition converts that year to “leap” or “not-leap”, accordingly.