Mini Project nº1

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Description of our options:

Throughout the project in terms of decisions when developing the transducers, the final states were chosen so it would resort to backtracking if it didn't end in the proper state.
For each of the steps there are either one or two default transitions (the output symbol is the same as the input symbol) for when no transformation can be applied.
We use the term "transformation" for the cases in which a sub-set of input symbols is not the same one as the output.
The default transitions have a weight of 1 while every other transition has an omitted weight (equivalent to zero).
This happens so that whenever a pattern on the input tape requires a transformation, this path on the graph is preferred over the default one.
When implementing the MetaphoneLN transducer, we applied the composition operation to step1 and step2.
The transducer generated by this operation was composed to the remaining transducers one by one, maintaining every rule by each step generating the MetaphoneLN transducer.
To generate the inversion of this transducer we simply applied the invert operation.

Viability of our solution:

The solution is viable and useful in terms of applying the required Metaphone algorithm. It is deterministic, so every input with the correct symbols returns an output tape, and applies every rule following their order.

Usability of the "inverted" MetaphoneLN:

Regarding the inverted Metaphone, if the idea was to revert back to their original state words that had been "metaphoned", it is not a useful tool.
For each letter it grabs the first rule it can find that "fits" and applies it in reverse. In this case it turns out that rule was the one for dropping duplicate letters. This means the only thing is does is applying this rule in reverse: it duplicates letters.
Because there is no weight priority in terms of trying to apply the latter steps first, it will always unfold each letter one by one.