ANLP Self-Assessment Exercises for Week 2 (v1.5)

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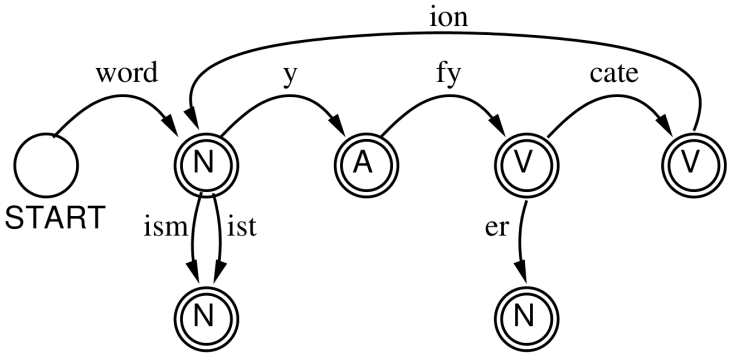
Goals

To give you practice working with finite state machines and thinking about these as an example of a model of language: what does a particular FSM predict about the language and why is the model designed the way it is?

Exercise 4

In lecture 3, there was an example of English derivational morphology based on the word *word*. The FSM below implements a fragment of English morphology that looks like this and generates words like *wordy*, *wordification*, etc. (assuming that spelling changes are fixed up by another FSA that applies afterward).



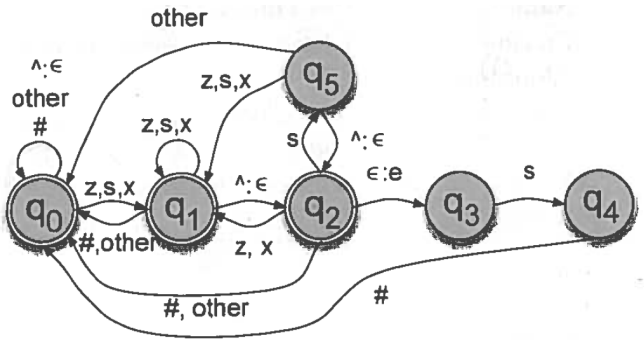
a) The example only includes a single stem, *word*, on the first transition arc. List three other stems that could go there. What kinds of words

can't go there?

b) Consider the transitions labeled *er*, *ism*, *ist*. All of these end up in states labelled N (noun). What would happen if we removed the bottom two noun states and made these transitions end up in the same state where the *word* transition ends? Give some examples of words that are generated. Do these seem like possible words of English to you? (You might have different judgments than other people!)

Exercise 5

The transducer from J&M Fig 3.17 is reproduced below. ('other' = none of {z,s,x,ˆ,#,ϵ}).



a) What sequence of states would we go through to create the correct plural form for `axleˆs#`?

b) What about for `lassˆs#`?

c) Can you think of any words that cause the transducer to go from state q_2 to q_5 and then continue on to an accepting (end) state? If not, can you at least say what properties would such a word need to have?