ambiguities: faster (adj+comp vs. verb+agentive) unforgettable untieable
- morphological parsing - orthographic spelling rules
- composition of finite-state transducers - minimization of finite-state transducers

1. Examples of English morphology.

2. Definition: a finite-state transducer consists of:
   - A finite set of \( N \) states \( Q = \{q_0, q_1, \ldots, q_{N-1}\} \), with \( q_0 \) the start state
   - A finite input alphabet \( \Sigma \) of symbols
   - A finite output alphabet \( \Delta \) of symbols
   - A set of final states \( F \subseteq Q \)
   - A transition relation between states. The transition relation \( \delta(q, i, o) \) takes three arguments—a state \( q \in Q \), an input symbol \( i \in \{\Sigma \cup \epsilon\} \), and an output symbol \( o \in \{\Delta \cup \epsilon\} \)—and returns a set of possible new states \( Q' \subseteq Q \).

3. Things you can use a finite-state transducer for:
   - String pair recognition: accept or reject a string pair
   - Finding the outputs corresponding to an input (or vice versa): give the transducer the input, it will give you the outputs

4. Morphological parsing with an FST.

5. Important operation: FSTs are closed under composition.
   - If FST \( A \) has input alphabet \( \Sigma \) and output alphabet \( \Gamma \), and FST \( B \) has input alphabet \( \Gamma \) and alphabet \( \Delta \), then the composition \( A \circ B \) is also an FST. If \( A \) accepts string pair \( \alpha: \gamma \) and \( B \) accepts string pair \( \gamma: \beta \), then \( A \circ B \) accepts \( \alpha: \beta \).

6. Orthographic spelling rules with an FST: we will assume that every word ends in the special end character \#.
7. Combining morphological parsing and orthographic rules as FST composition.