

LING 106: Homework 7

Cheat Sheet

1. THE PUMPING LEMMA IN REGULAR LANGUAGES

Drawing the machine for L has been giving people trouble. There are two ways you can approach this:

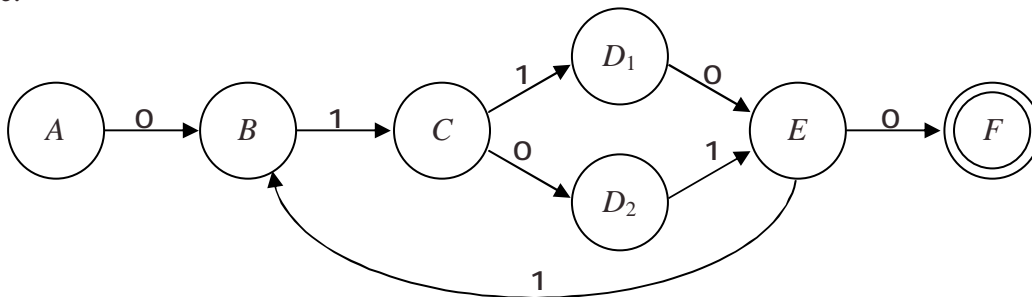
- Devise a machine that accepts any string that ends in 011 . From there, determine what can (and can't) follow the end of this string, and add transitions accordingly.
- Any string in L will have the form abc , where $b = 011$, and a and c are strings that don't contain 011 (each of which is possibly empty). That ensures that 011 occurs once—it's b —and only once—it's not in a or c .

Therefore, one way to draw a machine for L is to draw machines that model a , b , and c —call them M_a , M_b , M_c . Then concatenate the machines.

I prefer the first method, but you may have an easier time with the second, if the first has you stumped.

2. THE PUMPING LEMMA AND FSAS

The boxiness of the machine here may have confused people. I was attempting to make it relatively compact; but if it helps you visualize things, here's the same machine in a different shape.



3. IDENTIFYING REGULAR LANGUAGES

First, recall that the lecture notes advised:

To prove that a language **IS REGULAR**, construct a FSA.
To prove that a language **IS NOT REGULAR**, use the Pumping Lemma.

For advice on how to do the latter—i.e., to see what that kind of proof would look like—see sections 4.1 through 4.3 of the lecture notes.