

1 Finite State Transducers & Morphology (30 pts)

1.1 (25 pts)

Please do problem 3.2 (p.81) and use the `dot` language (available on the CLEAR machines or for free download from <http://www.graphviz.org/>) to draw the resulting FST. Full dot documentation is available from <http://www.graphviz.org/Documentation.php>. Here is the dot input used to generate a figure like J&M's 3.17:

```
/* Save to FST3-17.dot and generate image with command:
   dot -T png -o FST.png FST3-17.dot */

digraph jm_three_seventeen {
    /* tries to flatten the graph out, left to right */
    rankdir = LR;

    /* next line sets the shape for accept nodes */
    node [shape = doublecircle, style=filled, color=azure3]; q0 q1 q2;

    /* make all nodes the same shape and color */
    node [shape = circle, style=filled, color=azure3];

    /* define the edges of our graph */
    q0 -> q0 [ label = "ˆ:&epsilon;\nother\n#", dir = back];
    q0 -> q1 [ label = "z,s,x"];

    q1 -> q0 [ label = "#,other"];
    q1 -> q1 [ label = "z,s,x", dir = back];
    q1 -> q2 [ label = "ˆ:&epsilon;"];

    q2 -> q0 [ label = "#,other"];
    q2 -> q1 [ label = "z,x"];
    q2 -> q3 [ label = "&epsilon;;e"];
    q2 -> q5 [ label = "s"];

    q3 -> q4 [ label = "s"];

    q4 -> q0 [ label = "#"];

    q5 -> q0 [ label = "other"];
    q5 -> q1 [ label = "z,s,x"];
    q5 -> q2 [ label = "ˆ:&epsilon;"];
}
```

Protip: On the CLEAR machines: create a UNIX directory with `mkdir -p /Public/www/hw2/`, use `mv` or `cp` to put your png file in that directory, and then point your web browser at <http://netid.web.rice.edu/hw2/>

(where ‘netid’ is your Rice NetID name) to easily see the image.

1.2 (5pts)

Please answer J&M problem 3.9: Why does our figure 3.17 include a z,s,x arc from q5 to q1?

2 Minimum Edit Distance: (30 pts)

Please do problem 3.10. Be sure to draw and hand in the matrices for **drive** → **brief** and **drive** → **divers**, provide edit distances between each pair of strings, explain which pair is closer, and highlight the best path through each matrix.