Assignment 4a
SOLUTIONS
**Problem 2a:**

<table>
<thead>
<tr>
<th>Mary</th>
<th>likes</th>
<th>giant</th>
<th>programs</th>
<th>.</th>
</tr>
</thead>
</table>
| NNP: -0.2  
NP: -0.35 | -     | -     | X3: -2.05  
S: -2.15 |   |
| VB: -0.6     | -     | VP: -1.7  
S: -2.3 |   |
| JJ: 0.0     | NP: -0.8 | - |   |
| NNS: 0.0    | -     |   | :: 0.0 |

**With backpointers:**

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| NNS: 0.0    | -     |   | :: 0.0 |
Problem 2b:

Mary likes giant programs.
Problem 3:

I tried to give individual feedback as I graded. There are many ways to solve this, so I’m not going to give a particular solution. If you have questions about your particular implementation, come talk to me.

Problem 4:

a) is significantly faster in practice. Option b) requires iterating over all of the rules many, many times! There are almost 200K rules in the large rule set, so this can be very expensive.

Although approach a) does require looking at the cross-product of the contents in two cells, since the number of constituents is much, much less than the number of rules AND the sentence itself constrains the possible constituents, this cross-product tends to be very small.