Assignment 1

L445/L515
Text and Speech Encoding

Due Friday, September 9

1. Do question #2 from chapter 1 of the draft textbook (p. 36–37).

2. (a) Give the base ten numbers for the following base two numbers:
   i. 1101 1101
   ii. 1010 0011
   (b) Give the base two (binary) numbers for these base ten numbers:
   i. 45
   ii. 245

3. Do question #3 from chapter 1 of the draft textbook (p. 37).

4. Do question #4 from chapter 1 of the draft textbook (p. 37).

5. Attempt to “break” one of the TTS systems mentioned in the notes. Come
   up with example sentences to try; describe what you expect to go wrong;
   and analyze what the TTS system does well and what its limitations are.

6. Table 1\textsuperscript{1} provides bigram probabilities. For example, \(P(\text{want}|i) = 0.22\). Ignoring start and end probabilities, calculate the probabilities for the
   following sentences using a bigram model. Show your work.
   
   (a) i want to eat chinese food
   (b) i want to eat lunch

7. Do question #10 from chapter 1 of the draft textbook (p. 38) ... with the
   alteration that you are only asking 5 friends (or however many you need
   to sufficiently answer part b).

8. **L515 only:** Do question #5 from the draft textbook (p. 37–38).

\textsuperscript{1}Figure 6.7 in Jurafsky and Martin (2000), 1st edition.
I want to eat Chinese food lunch

Table 1: Bigram probabilities

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>want</th>
<th>to</th>
<th>eat</th>
<th>Chinese</th>
<th>food</th>
<th>lunch</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>0.0018</td>
<td>0.22</td>
<td>0.0020</td>
<td>0.0028</td>
<td>0.00020</td>
<td>0.0020</td>
<td>0.0020</td>
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<tr>
<td>want</td>
<td>0.0014</td>
<td>0.0035</td>
<td>0.28</td>
<td>0.0035</td>
<td>0.0025</td>
<td>0.0032</td>
<td>0.0025</td>
</tr>
<tr>
<td>to</td>
<td>0.00082</td>
<td>0.0021</td>
<td>0.0023</td>
<td>0.18</td>
<td>0.00082</td>
<td>0.0021</td>
<td>0.0027</td>
</tr>
<tr>
<td>eat</td>
<td>0.00039</td>
<td>0.00039</td>
<td>0.0012</td>
<td>0.00039</td>
<td>0.0078</td>
<td>0.0012</td>
<td>0.021</td>
</tr>
<tr>
<td>Chinese</td>
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<td>0.00055</td>
<td>0.0055</td>
<td>0.00055</td>
<td>0.00055</td>
<td>0.066</td>
<td>0.0011</td>
</tr>
<tr>
<td>food</td>
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<td>0.00032</td>
<td>0.0058</td>
<td>0.00032</td>
<td>0.00032</td>
<td>0.0032</td>
<td>0.00032</td>
</tr>
<tr>
<td>lunch</td>
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<td>0.00048</td>
<td>0.00048</td>
<td>0.00048</td>
<td>0.00048</td>
<td>0.0096</td>
<td>0.00048</td>
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