Linguistics 384
Homework 1

Text and Speech Encoding

DUE: Wednesday, January 18, 2006

- **Problem Solving** (to prepare for the quiz on January 18, 2006)

  1. Consider the Cypriot syllabary mentioned in class (in the slides or at http://www.omniglot.com/writing/cypriot.htm). If Cypriot were written using a syllabic alphabet instead of with a syllabary:
     (a) What would be a good choice for the underlying vowel?
     (b) How many symbols would there be in the syllabic alphabet? (You can ignore the leftmost column of vowel symbols in the Cypriot chart.)
     (c) How could you modify the syllabary to create a syllabic alphabet? Give examples for syllables including all five vowels. (Hint: look at Redjang/Kaganga, `http://www.omniglot.com/writing/redjang.htm`)
  2. Convert the decimal (a.k.a. base 10) number **103** into a binary (a.k.a. base 2) number. (On the quiz, you may use any method discussed in class, but you must show all your work to receive full credit.)
  3. Convert the following the binary numbers into decimal numbers. (On the quiz, you may use any method discussed in class, but you must show all your work to receive full credit.)
     (a) 1101110
     (b) 1010011
     (c) 1111010
  4. Write out the first **3** letters of the city you were born in (Romanized, if necessary) and give the corresponding ASCII codes for each of them in both decimal and **7-bit** binary notation. This is done below for my hometown "Asheville". Be sure that if you use a lowercase letter in your answer, I expect the number to match the lowercase ASCII code.

     (Likewise, on the quiz, you may use any method discussed in class, but you must show your work.)

letter	ASCII number	binary number
A	65	1000001
s	115	1110011
h	104	1101000

- **Essay** (to hand in on January 18, 2006)

  1. Thinking about pronunciation:

     In your own words, describe the differences between the following pairs of sounds. Consider: place of articulation (e.g., where your tongue is, which parts of the vocal tract you are using to produce the sound, etc.), voicing (i.e., if your vocal cords are vibrating), and manner of articulation (i.e., how the air is moving out of your mouth/nose).

     (a) *d* (as in *dot*) vs. *n* (as in *never*)

     (b) *p* (as in *pat*) vs. *k* (as in *kite*)

     (c) *th* (as in *thin*) vs. *th* (as in *this*)

  2. Looking back at your notes for ASR and TTS systems—and, more importantly, THINKING about the issues involved—which do you see as a harder task: automatic speech recognition or text-to-speech synthesis? Or are they equally hard? I'm not looking for one correct answer, just solid reasoning.