Homework 1: Text and Speech encoding

Linguistics 384 (Detmar Meurers)

Due at beginning of class on Tuesday, October 12, 2004

1. (30 points) Go to www.omniglot.com. Find one example of an abjad, an alphabet (NOT Latin/Roman), a syllabary, a syllabic alphabet, and a logography. For each example, give me two (2) facts about it. For the abjad and syllabary, attempt to write your first name in the language— you will likely have to approximate your name. (Pay attention to which direction the language is written in.)

2. In class we mentioned how many characters can be stored with a certain number of bits. Here's a recap:

Number of bits	Number of characters
1	2
2	4
3	8
4	16
5	32
6	64
7	128
8	256

   (a) (10 points) Based on this, how many characters would you be able to store using 9 bits?

   (b) (10 points extra) What is the general formula – i.e. for n number of bits, how many characters can you store?

3. (20 points) Give me the base ten numbers for the following binary numbers (written in standard order, i.e., Big Endian):

   (a) 1011 1111

   (b) 0101 0101

   (c) 1010 0010

   (d) 1010 1110

4. (20 points) Write out your family name using ASCII code, in both ordinary numbers (base 10) and binary (base 2, in standard order). As an example, here is what this looks like for my family name.

Keep in mind that lowercase and uppercase letters have different ASCII codes.

letter	ASCII number	bit notation
M	77	100 1101
e	101	110 0101
u	117	111 0101
r	114	111 0010
e	101	110 0101
r	114	111 0010
s	115	111 0011

5. The stick your finger in your mouth exercise: In your own words, describe the differences between the following pairs of sounds. Consider: where your tongue is, if your tongue is making contact with any part of your mouth, if your vocal cords are vibrating, where/how the air is moving out of your mouth, etc. There may be more than one difference. (When in doubt, simply describe what's happening.)

   (a) (10 points) *p* vs. *v*

   (b) (10 points) *n* vs. *ng* (as in *ring*)

   (c) (10 points extra) *sh* vs. *ch*

   (d) (10 points extra) *r* vs. *l*

6. (20 points extra) 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.

Number of points: of 100 required points

Grade: