6.811 Principles and Practices of Assistive Technology
Electronic Access Lab (Part 1)

Station B: Alternative Text Input

You should do the "Conventional Typing" activity first on a laptop; afterward, you can do the other activities in any order depending on equipment availability. Keep track of this for the alternative keyboard/mice exercise.

Conventional Typing

For this exercise, you need a laptop computer to obtain a baseline of your conventional typing speed.

1. Go to http://www.typingtest.com/ and conduct a minute-long typing test.
2. Repeat two more times for a total of three trials. Note whether your typing speed (adjusted for errors) has increased or decreased (due to learning effects or fatigue).

Dasher

For this exercise, you will test out Dasher, an input method developed by the Inference Group at the University of Cambridge.

1. On your laptop, go to www.inference.phy.cam.ac.uk/dasher/ and click on "Download" in the sidebar.
2. Download and install Dasher for your operating system. There are Windows, MacOS, and Linux versions.
3. Once installed, play around with Dasher for a minute or two. What are your first impressions and thoughts about the interface? Based on your interaction, how do you think it works? Adjust the speed of Dasher (in the bottom left corner of the interface) to a speed that you think is optimal.
4. Prepare a stopwatch (either your own or www.online-stopwatch.com/). Type out the following passage using Dasher (the first sentence of Black Beauty by Anna Sewell) letter for letter, i.e. without any errors.

```
The first place that I can well remember
was a large pleasant meadow with a pond
of clear water in it.
```

This paragraph contained 21 words. Compute your WPM.

5. Practice with Dasher for five minutes to try to improve your proficiency of the interface. Afterward, try typing the following sentence (paraphrased from the *Americans with Disabilities Act*) letter for letter, i.e. do not make mistakes. Use a stopwatch.

```
It is the purpose of the Americans with
Disabilities Act to provide a clear and
comprehensive national mandate for the
elimination of discrimination against
individuals with disabilities.
```

This sentence contains 24 words. Compute your WPM. Did your time improve?

6. In the options, change the Alphabet to "More Alphabets…" "Deutsch / German with limited punctuation". Try typing in the Black Beauty sentence again and compute your WPM. How was this different?

7. Change the alphabet back to "English with limited punctuation". What do you predict will happen if you are asked to type non-words? Use a stopwatch to calculate your WPM for the following text:

```
aRgfhE uIfsacm fdfqkk jfIOPL TrdIfd
```

8. Some experienced users of Dasher (often people with physical disabilities who cannot use a physical keyboard, but instead rely on mouse or head-tracker input) can achieve speeds of over 30 words per minute. The performance is achieved in part by the system's language model, which adjusts the sizes of letters based on the probability of the word. You should discuss the pros and cons of language models.

Speech Recognition
Speech recognition might be useful for people who do not have the fine motor skills needed to use a keyboard. In this part of the activity, you will test out automatic speech recognizers typically used for web search and examine the limits of speech recognition.

1. Set up a speech recognizer on your computer or mobile device. This might include:
   ● Siri (free) on an iPhone or iPad using the Notes application.
   ● Google's speech recognizer on an Android smartphone, used as input to a text message or document.
   ● Speech icon on the www.google.com search prompt (via a laptop and Google Chrome, which you may need to install).
Familiarize yourself with the speech interface. Try the phrase "Furiously sleep ideas green colorless." What was the result?

2. Try saying each of the words separately, e.g. "furiously", "sleep", and so on. Do you experience an improvement or degradation in performance?
3. Try saying "Massachusetts Institute of Technology." Now, try "Maine Institute of Technology." What are the results? Try additional single-syllable words and longer phrases and note the performance of the speech recognizer.
4. Try saying ` printf("hello world\n"); ` and ` #include <cstdlib> `

Dictation Interfaces
This section will give you a sense of speech recognition interfaces for navigating a desktop environment and dictating a document.
1. In Windows 7, click on the Start menu, go to Control Panel, and click on "Ease of Access".
2. Under "Speech Recognition", click on "Start Speech Recognition." Follow the wizard, if necessary, to ensure that your microphone is working (this should only be necessary for the first person to use the workstation.
3. Click on "Open the Speech Reference Card" to learn the different kinds of speech commands that can be used in Windows 7. Launch Microsoft Word or another word processor (e.g. Notepad or Wordpad)

4. Start the stopwatch and try dictating the Black Beauty sentence word for word, i.e. without any errors. Try doing this entirely without the use of the mouse or keyboard –you should be able to use speech commands, for example, to correct any errors. Compute your WPM.

5. Spend up to five minutes testing out different speech correction functions, including deleting words, changing the capitalization of a word, and spelling out words letter by letter. Start a stopwatch and try dictating the Americans with Disabilities Act sentence. Compute your WPM.

6.811 Principles and Practice of Assistive Technology
Fall 2014