

## Na10. Cursive Writing Project.

**Overview:** You will form teams to create a cursive writing font and a cursive writing system. At the minimum, the final program should input an arbitrary word of up to 20 lower case letters and output the word in cursive writing on the screen. One program from each team is due in one week, at which time we will have a contest to see which team produces the best cursive writing.

**The team.** Each team should include at least one person with each of the following skills:

1. An artist who has studied cursive handwriting in school and knows how to form cursive letters and words. (See also <http://www.2020site.org/writing/index.html> or many other pages found by googling “cursive writing”)
2. A coordinator who will organize the group and facilitate working together.
3. A programmer who knows how to plan and implement a modular program.

**The task.** Each team will produce a cursive writing program as indicated in the overview. Here are some of the subtasks:

1. Design a “cursive font.”
  - a. Knots must be chosen so that when the letter is drawn, it is centered horizontally on the  $y$  – axis and rests on the  $x$  – axis.
  - b. Tall letters  $\{b, d, f, h, k, l, t\}$  are twice as high as small letters  $\{a, c, e, m, n, o, r, s, u, v, w, x\}$ .
  - c. Tails of the letters  $\{f, g, j, p, q, y, z\}$  extend below the  $x$  axis the same distance as the small letters extend above it.
  - d. Sharp corners such as in  $\{b\}$  may require a second primary stroke or a double knot. Experiment to make sure what works best.
  - e. The letters  $\{i, j, t, x\}$  have a secondary stroke (dots or crosses) which are best drawn after the rest of the word is written.
  - f. Scale is arbitrary, but all letters must be drawn to the same scale.
  - g. Test letters by writing them out one at a time in cursive on your screen.
2. Make a text file “dictionary” containing the information needed to write each letter.
  - a. The first line of each entry should contain the letter itself.
  - b. The following lines will contain the knots for the primary stroke(s) of the letter, with one line per stroke.
  - c. Lines beginning with an asterisk (“\*”) denote secondary strokes. These will be drawn after all the primary strokes of the word are completed.
  - d. A blank line denotes the end of each entry in the dictionary.
  - e. Comments are ignored (“#”)
3. Design a program for cursive writing.
  - a. Read in the dictionary of all letters.

- b. Input a word to be written
- c. Shift the points of each letter to the right by adding an appropriate amount to the x coordinates.
- d. When all the letters of the input word have been positioned, draw a parametric cubic spline through each primary stroke.
- e. When the primary strokes are all drawn, draw the secondary strokes (if any).

**Bells and Whistles:** If you want to make your program fancy, here are some suggestions:

1. Letters  $\{b, o, v, w\}$  end up off the  $x$  – axis, so that letters immediately following are formed slightly differently. You might try having two versions of each letter, or identify an initial segment that should be included/excluded depending on the previous letter.
2. Write a paragraph of cursive words. This will require keeping track of (vertical distances as well as horizontal)..