Lab 7: Dots

# Overview

The goal of this lab is to learn about the HTML Canvas. We will be doing this by drawing dots on the screen! Think of this lab like creating your desktop. You will be able to draw dots, move them around (like your desktop), select them, delete them, and so on. Later on, we will be turning it into a graph visualization.

# Lab Suggested Parts:

1. Dots
   1. Allow dots to be drawn
   2. Save info about each dot drawn (position, radius)
   3. Have a Clear button
2. Select
   1. Click and drag rectangle to select dots.
   2. Dot colors should change when selected.
   3. A re-click/drag indicates a new selection (replacement).
   4. But if the ctrl key is down it's added to prior selection
3. Click and drag a dot
   1. Be able to click on and drag a dot
   2. If a dot is created, clicked on, or a rectangle is created it becomes selected
   3. Pressing escape or clicking on the canvas unselects any selected object
   4. Use arrow keys for fine grained positioning of selected object
4. If a set of dots is selected ...
   1. Pressing the delete key deletes them (and any edge going to them)
   2. Define S to be the set of selected dots
      1. Pressing 'e(dges)' connects each dot in S with every other dot in S.
      2. Pressing 'c(lear)' removes any edgesbetween dots in S.
      3. Pressing 't(oggle)' removes all existing edges between dots in S and inserts an edge if none was there.
5. Toggling
   1. Allow for dots to be toggled from the selected set if the ctrl key is pressed while clicking.
6. Saving
   1. Save your canvas to the server
   2. Allow your canvas to be named and retrieved.
7. Let T be the set of dots not in S
   1. Pressing 'E', 'C', or 'T' does the same as 4b, except that the pairs of dots are one from S and one from T.
   2. Update the edges as or after you do repositioning (dragging dots and moving selected objects).
8. Input (Textbox potentially)
   1. Allow for a path to be input
   2. Allow for a cycle to be input
      1. Allow undoing the most recent dot
      2. Allow undoing the most recent path/cycle
9. Allow attributes to be set on both dots and edges, including names, values, and display attributes.

# Resources

## Drawing a rectangle on the canvas?

http://atomicrobotdesign.com/blog/javascript/draw-a-rectangle-using-the-mouse-on-the-canvas-in-less-than-40-lines-of-javascript/

## Dragging a rectangle on the canvas:

http://nightlycoding.com/index.php/2014/02/click-and-drag-multi-selection-rectangle-with-javascript/

## Dragging canvas objects:

http://rectangleworld.com/blog/archives/129

http://rectangleworld.com/blog/archives/15

http://rectangleworld.com/demos/SimpleDragging/SimpleDragging