

CS/INFO 3300 // INFO 5100

Homework 2

Due at 11:59pm Monday, February 4

Goals: Get practice using SVG elements.

Your work should be in the form of an HTML file called index.html with one `<p>` element per problem. Wrap any SVG code for each problem in a `<svg>` element nested within the `<p>` element. For this homework we will not be using Javascript.

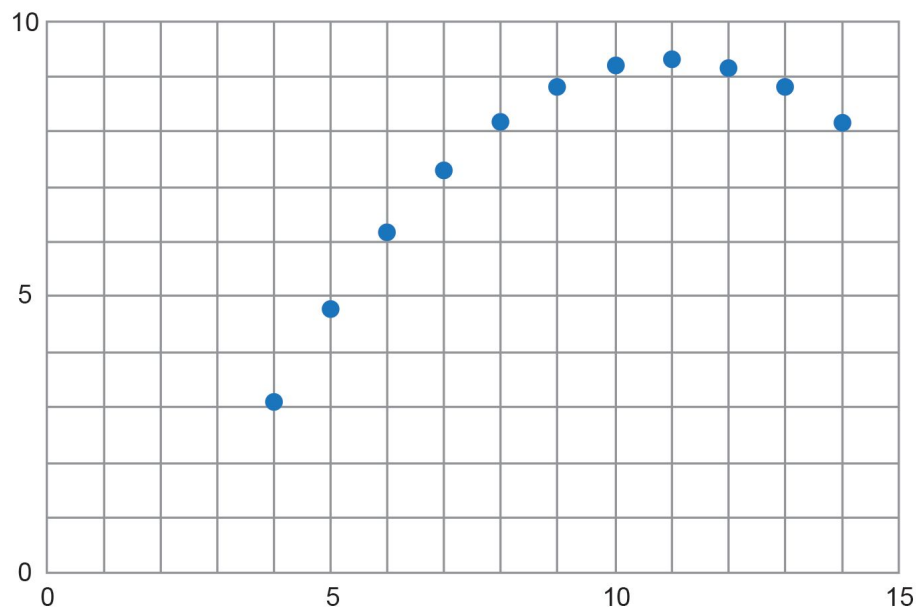
Since we want you to get more experience working with SVG, we would like you to complete this assignment using handwritten SVG elements. Some problems might require numbers like pixel positions which require calculation. Feel free to use whatever tool you prefer in order to compute these, but they should appear in your turn-in homework as literal numbers in the code. You can use a [color picker tool](#) to find good colors, but once again they must appear as literal elements in the file. You may not use an SVG authoring tool like Adobe Illustrator. We can tell if you use one, and the time it would take to obfuscate their output is much greater than just doing the assignment yourself.

Create a zip archive containing your HTML file and upload it to CMS before the deadline.

(see next page)

1. Create a 200x200 pixel SVG element with the word "INFO3300" in your choice of blue color, centered in the exact middle (vertically *and* horizontally), using the Palatino typeface, with a drop shadow for the word. Consult the SVG specification (spec [here](#), useful resource [here](#)) to find out how to change color and font attributes, set text alignment, and add filters and shadows. Put a small pink circle at (100,100) so we can verify that your text is centered. If you do not have Palatino, you may use another font to test your code, but set it as Palatino in the final version for grading. (20pts)

2. Create a 300x200 pixel SVG element. Reproduce this plot of Anscombe Quartet #2 using SVG elements:



The main plot region, excluding axis labels, should be 270x180 pixels in size. Reserve the remaining pixels as padding for the axis labels. Data for Anscombe's Quartet #2 are provided at the bottom of this homework file. You can calculate the proper pixel positions for the (x, y) coordinates from the data as necessary. Remember to account for the "padding" pixels below and to the left of the axes where the labels are placed. Include axis labels as depicted in the image in Arial typeface. Circle marks should be reasonably sized and in a dark color of your choosing. Include gridlines for each integer (0,1,2,3,4,5...). Your result may not look exactly like the figure; we will be grading based on your accuracy in positioning points. Points intersecting axes are ok. (20pts)

3. Use <line> and <rect> elements to create your own version of a Piet Mondrian painting in a 200x200 SVG canvas. [Piet Mondrian](#) was an early 20th century artist who, as a member of the De Stijl movement, reduced his art to three primary colors and black lines in a series of famous *neoplasticist* works. Here are some examples: [one](#), [two](#), [three](#), [four](#). In your own neoplastic work, you must include at least 6 lines and 3 rectangles. <line> elements must use a black stroke and <rect> elements must be either red, yellow, or blue. For this homework rectangles must be completely enclosed by lines or the edges of the canvas (though in Mondrian's work this was not always the case). You may use any additional features you feel would add aesthetic value. If you use a tool to generate coordinates for shapes, please cite that tool. There will be a small creativity component in grading, but faithfulness to art history will not be evaluated. (20pts)

4. Make a bar plot that represents the frequency of numbers in this dataset (a histogram):

let samples = [5, 1, 7, 3, 15, 10, 0, 10, 8, 5, 5, 2, 14, 6, 7, 6]; 0,1,2,3,5(3),6(2),7(2),8,10(2),14,15

In your histogram, the x-axis will correspond to values from the dataset, and the y-axis will correspond to the frequency of those values. Figure out how to map those numbers into pixel coordinates.

A. Make a bar plot of the data values using SVG rectangles. Create one rectangle for each distinct integer in the dataset. Each one should be positioned so that it is centered at the x-axis value that corresponds to its data value. For example, the middle of the bar for "3" should be at the pixel coordinate that corresponds to the value 3. In other words, leave empty space even for values that have no observations: there should be a gap between the bars for 8 and 10. (25pts)

B. Calculate the mean, median, mode, and standard deviation and record those numbers in the <p> tag. You may use whatever tool you like, we only need to see the result. (5 pts)

C. Add vertical lines to the plot corresponding to the mean (in red), median (in blue) and mode (in purple). For the "mean" line, make a line from the top of the figure to the bottom, at the x position in the figure that corresponds to the mean you calculated. (5 pts)

D. Use an SVG rectangle with a semi-transparent fill to show the region covering one standard deviation on both sides of the mean. In other words, make a rectangle from the top of the figure to the bottom that is centered at the mean, and two standard deviations wide. (5pts)

Anscombe's Quartet -- #2

x	y
10	9.14
8	8.14
13	8.74
9	8.77
11	9.26
14	8.1
6	6.13
4	3.1
12	9.13
7	7.26
5	4.74

$$30+x*18,(10-y)*18+5$$