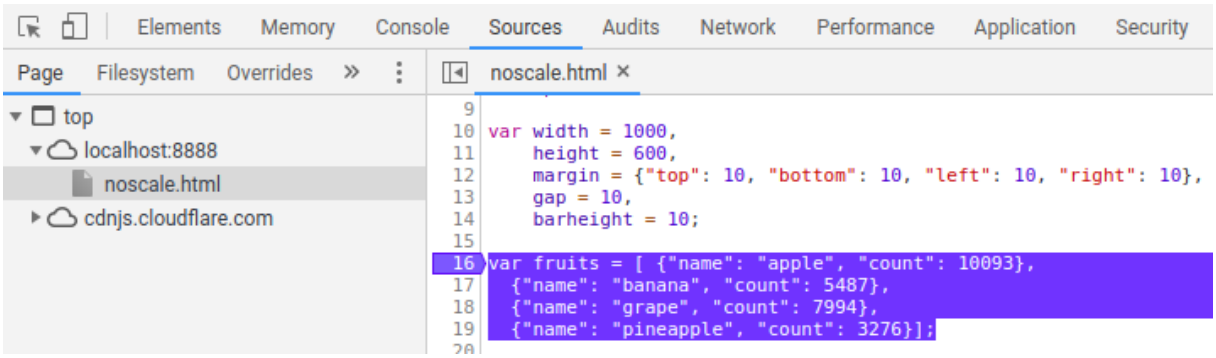
COMP5048 Week 3 Extra Tutorial

For these exercises, you may set up a server from the comp5048_wk3_extra using the same steps as the main tutorial.

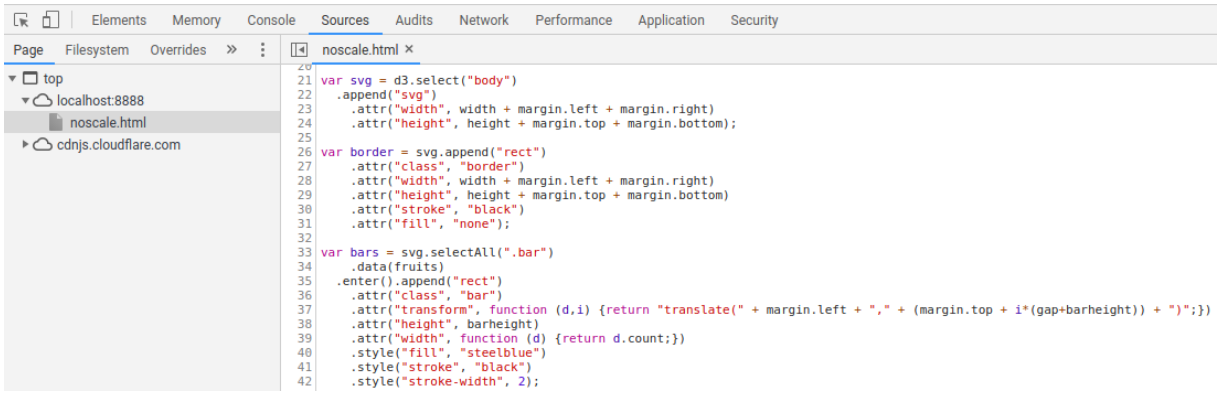
1. Size scales

1. Open the page *noscale.html* in a browser. You will see that the bars go over the right border of the SVG area.

2. Examine the sources. Note the fruits variable – bars are created for each entry with the bar length varying according to the counts.

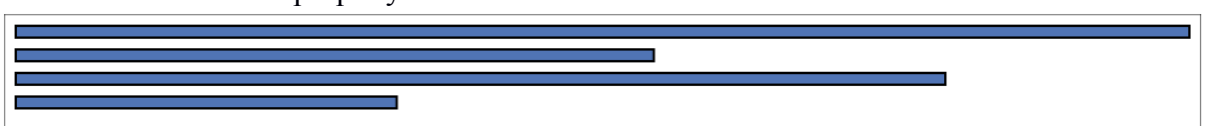


3. The bars are given the class "bar" to differentiate from the rectangle that makes the SVG area border (classed "border" using *.attr("class", "border")* on line 27), and to select them we use the dot prefix (*svg.selectAll(".bar")* on line 33). Once the data is assigned to the selection and rect objects appended, the "bar" class is assigned (*.attr("class", "bar")*).



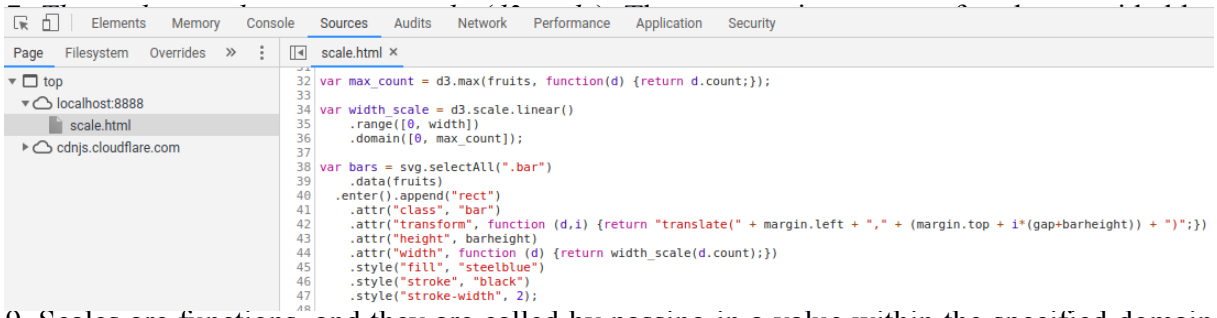
4. *The width assigned to the bars are simply the value of the "count" property of each entry (.attr("width", function (d) {return d.count;})*).

5. To make sure the bars fit completely inside the SVG area, we will scale the widths to occupy only the available area. Open the page *scale.html* and examine the sources, which is similar to *noscale.html* up to the declaration of the border. You will see now that the bars are contained fully inside the SVG area, while preserving the proper ratio of lengths depending on each entries' count property.



6. *To scale the widths of the bars, we first need to know the maximum of the counts of the objects in the fruits array. This can be done using d3.max*. The first argument is an array, while the (optional) second argument is an accessor, denoting how the members of the array

should be compared - in this case, we compare the items using their "count" values (*function(d) {return d.count;}*). (line 32)



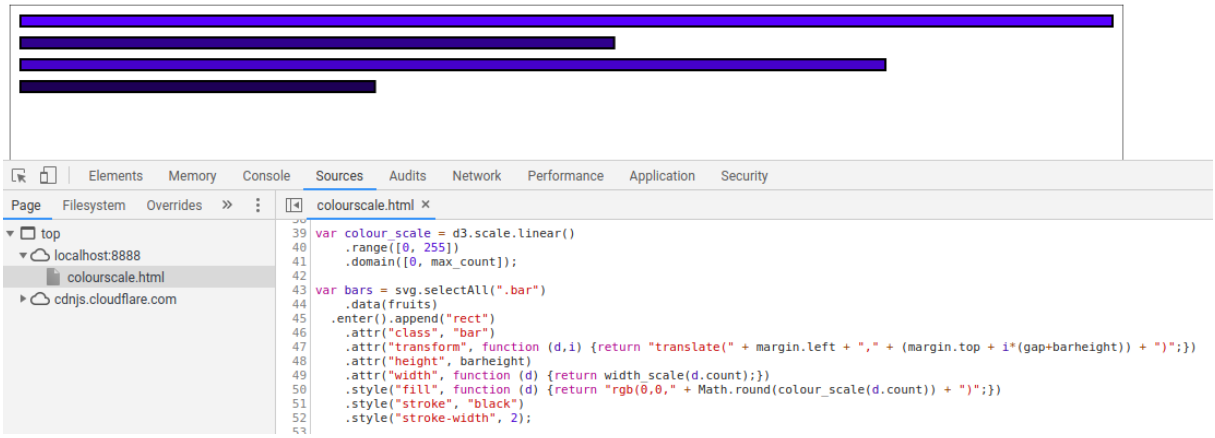
9. Scales are functions, and they are called by passing in a value within the specified domain and returns that value mapped to a value in the specified range. In this case, we pass the count property of the entries of fruits and it returns a value shorter than the width of the SVG area (on the lines described in step 8), which we then use to specify the bar lengths (*.attr("width", function (d) {return width scale(d.count);})* on line 44).

For the extra homework, you can change the range of the scale or try a different type of scale.

2. Colour scales

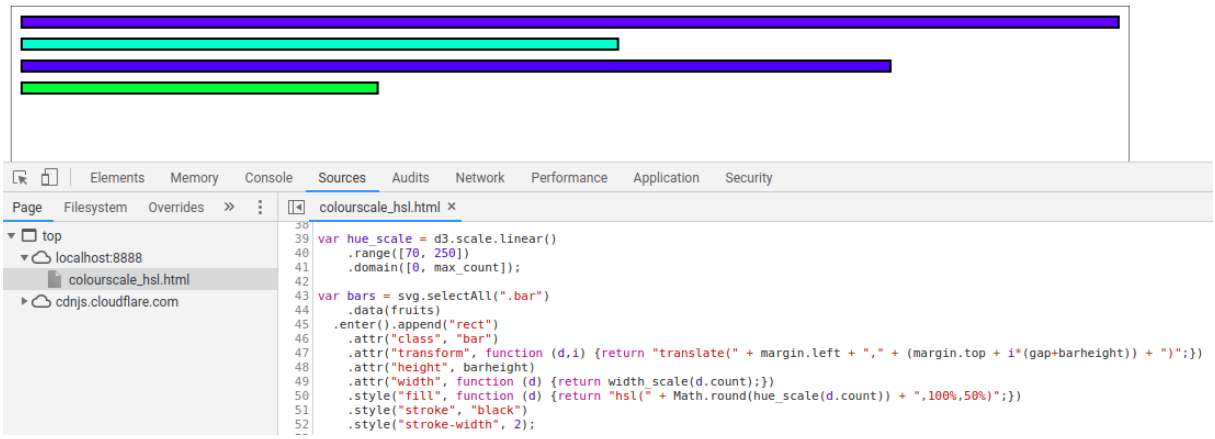
This example takes the same data array as the previous example, but in addition to the bar width, the colour is varied according to the count value as well.

1. *Open colourscale.html* and examine the sources. Notice the additional variable *colour_scale* on line 39 - this is a scale similar to width scale, but the range is set between 0 and 255. This is the range of values each component of the RGB (red green blue) colour model can take.



2. In this example, we will make higher colour value correspond to higher blue values. RGB colour values are expressed using strings in the format RGB(r,g,b), where r, g, and b are integer values between 0 and 255 denoting the value of each colour component. We use *colour_scale* to calculate the value of the blue component depending on the count value (*return "rgb(0,0," + Math.round(colour scale(d.count)) + ")"* on line 50). *Math.round* is used as the RGB component values have to be integers).

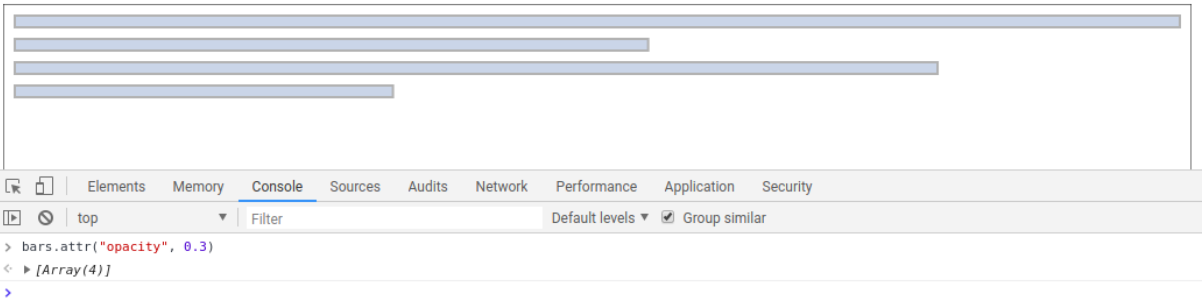
3. colourscale hsl.html is a variation which uses the HSL (hue saturation lightness) colour model instead of RGB. Here, we vary the hue according to the count value, and *hue_scale* takes as a range a subset of the full hue range (0 to 360), in this case from green to blue. Meanwhile, saturation and lightness takes values between 0-100%.



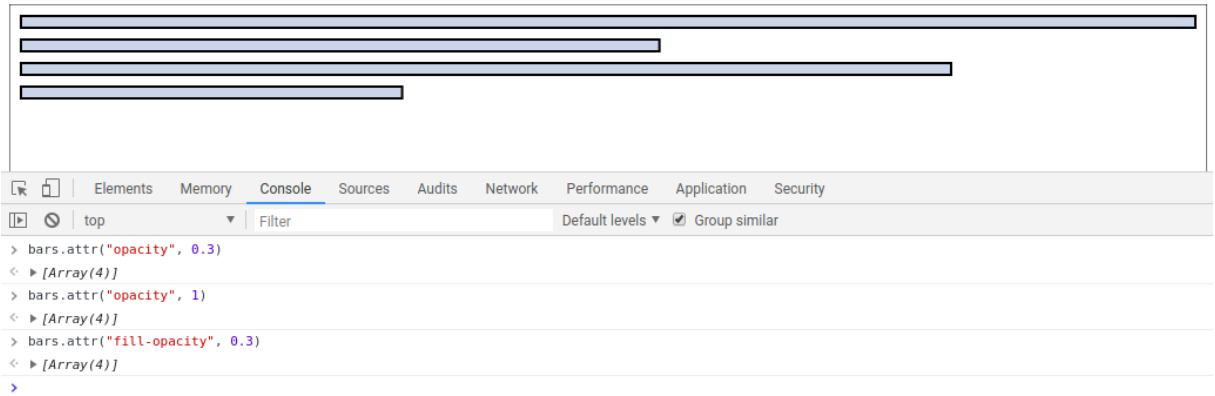
For the extra homework, try playing around with the range of colour values and/or changing different components (e.g. modify red instead of blue).

3. Opacity

1. Open *scale.html* again. Here, all the bars have an opacity of 1, i.e. fully solid for both its fill and stroke (border). Opacity can take values between 0 and 1, where lower opacity values make the objects more "transparent".
2. To change the overall opacity of the item, change the opacity attribute: *bars.attr("opacity", 0.3)*. Restore it back to 1.



3. *To change only the opacity of the fill, use fill-opacity: bars.attr("fill-opacity", 0.3).*



4. To change only the opacity of the border stroke, use stroke-opacity: *bars.attr("stroke-opacity", 0.3)*. This is also how you change the opacity of lines.