Problem 1: Readings on D3 and SVG

Please read this blog post about D3, Three Little Circles, A Bar Chart Part 1 and answer the following questions. For further reference a short list of D3 and SVG resources is included below. Please take a look, as these may be helpful for this homework or future projects!

1. How can D3 access and change the DOM? What do `select` and `selectAll` do?'

   For example to access every paragraph and change the color of every paragraph, "d3.selectAll("p").style("color", "white");" works. To access and change an element "#title", use "d3.select("#title").style("font-size", "13px");"

2. What are the `d` and `i` in `function(d){}` and `function(d, i){}`?

   "d" is the data and "i" is the index.

3. Write sample lines of JavaScript to add a `div` element with class "barChart1" and to add an svg element with class "barChart2" with square dimensions.

   1. *d3.select("body").append("div").attr("class", "barChart1")*
   2. *d3.select("body").append("svg").attr("class", "barChart2").attr("width", dimension) .attr("height", dimension);*

4. Describe `append`, `update`, `enter`, and `exit` at a high level. What does "selectAll + data + enter + append" refer to?

   1. *"selectAll(cirlce)" returns a list of all paragraphs*
   2. *".data(array)" defines the data array*
   3. *".enter()" defines the missing circles for the data*
   4. *".append("circle")" appends the missing circles*

   There are three possible outcomes that result from joining data to elements:

   1. *enter - incoming elements, entering the stage.*
   2. *update - persistent elements, staying on stage.*
   3. *exit - outgoing elements, exiting the stage.*

5. What are the main differences between drawing a bar chart with HTML and SVG?

   SVG is a vector and is thus scalable without graphical information loss. The SVG is not dependent of the resolution and no pixels are involved, only points. HTML canvas is resolution dependent and pixels have to be defined.

6. In drawing the simple bar chart with D3 and SVG, what elements were appended, and to what parts of the graph did these elements correspond?

   An SVG with rectangles and text in groups is appended to the graph. The position of the text is dependent of the height of the bar. The position of the bar is dependent of the SVG and the height of the bar is dependent of the data.