Questions Week 3

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

D3 stands for Data-Driven Documents and it is a JavaScript Library. It allows you to visualize data on a webpage. D3 binds data to a DOM and then it applies data-driven transformations to the document.

You can use select to manipulate individual nodes like 'body'. To manipulate a selection of nodes you can use selectAll, for example for all paragraphs.

Example select (select the body):
```
d3.select("body").style("background-color", "black");
```

Example selectAll (select all paragraphs):
```
d3.selectAll("p").style("color", "white");
```

2. What are the d and i in function(d){} and function(d, i){}?
D stands for data and i stands for index. These functions are used to bound data. In the function (d){}, the defailt join-by-index is used, which means that, the first element in the data array is passed to the first node in the selection, the second element to the second node, and so on. In the function(d,i){} you can choose 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.

```
d3.select("body").append("div")
    .attr("class","barChart1");

d3.select("body").append("svg")
    .append("svg")
    .attr("width", 500)
    .attr("height", 500);
```

4. Describe append, update, enter, and exit at a high level. What does "selectAll + data + enter + append" refer to?
It selects a container, it then selects all elements (there are none yet). Then we pass data in and we bound it to the alements. After that the enter statement prepares a placeholder for each data item. We now have a placeholder for every data element. After enter we append (create) all elements in the container. With the exit() method we can select elements to remove them. You can also remove nodes one by one with the remove() method.
In short: the enter() method is used for incoming elements, entering the stage. The update() method is used for persistent elements, staying on stage and the update() method is used for outgoing elements, exiting the stage.

5. What are the main differences between drawing a bar chart with HTML and SVG?
HTML is largely limited to rectangular shapes, SVG supports drawing primitives like Bezier curves, gradients, clipping and masks.

6. In drawing the simple bar chart with D3 and SVG, what elements were appended, and what parts of the graph did these elements correspond to?
'Bars' (rectangles) were appended to the svg and these elements correspond to the bars in the graph. Groups for the x-axis and the y-axis are also appended to the svg and they correspond to the y- and the x-axis in the graph.