1. Ware argues that human perception involves 2.5 dimensions. Given this assertion, when might a 3D visualization be useful and why?

   Some data already has three dimensial spacial properties, for example architectural design and data from biological and physical sciences. These kinds of data can by their nature be displayed in a 3D visualisation. This is stated in Colin Ware´s *visual thinking for design*, but this statement isnt further clarified, and the one example isnt very clear on why it´s a good display of 3D visualising, so I find it rather vague. The one reason I can think of is the fact that you have an additional dimension to display data in, so you can increase the data density of a visualisation. This, of course, comes at the cost of less clarity, because in a 3D visualisation data is going to overlap.

2. In Chapter 6, Ware presents some implications of pattern recognition and visual working memory on design. Provide an example that harnesses some of these principles (perhaps an advertisement, visualization, or interface) and discuss how the design takes these principles into account. Please include a screenshot, photo, or website URL.

This is an example of a series of advertisements initialised by the Dutch gouvernement to keep drivers from drinking while under influence of alcohol. BOB is a dutch abrreviation for designated driver, and these advertisements can be found on the side of the highway. Following Colin Ware, the visual working memory van hold up to three different objects.

This advertisent had exactly three, namely the large yellow word with the barbecue inside replacing the 'O', the white text in the center and the black tekst with the doormat. These object are clear and distinct because of the size and the contrast of the colours. The three elements themself contain some cleverly chosen associations with the message of the advertisement. The barbecue in the word "BOB" is a reference to the description below it. A dutch party is often accompinied by a barbecue and an awful lot of beer. While it seems so clear that you dont drive after a nights out, it is much more tempting to jump in the car after just a couple of beers at a birthday party. The yellow text in the bottom replaced the word "thuis" with a doormat, a reference to home. The sentence used can be taken metaphoricly or literally, meaning its a good habit (to skip drinking when you need to drive) and that you can come home (instead of going to a hospital for example). Combine these association with the large public using the highway and the relevance and you have a perfect informative advertisement.

3. According to Bostock et. al., what are the primary advantages of D3? Based on your reading of the article, please provide an example of a type of visualization that would be easier and better implemented in D3 as opposed to HTML5, JSON, and Javascript. Please list the pros and cons of choosing D3 over pure HTML5, JSON and Javascript.

    D3 transforms the DOM based on data. For data visualisation, document elements need to be created and deleted, which is difficult in Jquery/Javascript and impossible in CSS/HTML. Javascript lacks a mechanism to add and remove elements to match a dataset, a feature which is present in D3. Besides that, they are almost equal, for D3 runs on Javascript and uses its language.

4. Of the visualization figures presented in Heer et. al., which do you find the most difficult to comprehend? Does the complexity of the figure interfere with the goal of visualization as described in the article? Include a screenshot of the figure you have chosen in your response and use principles that you have learned so far (i.e., from design, perception, and cognition) to justify your choice.
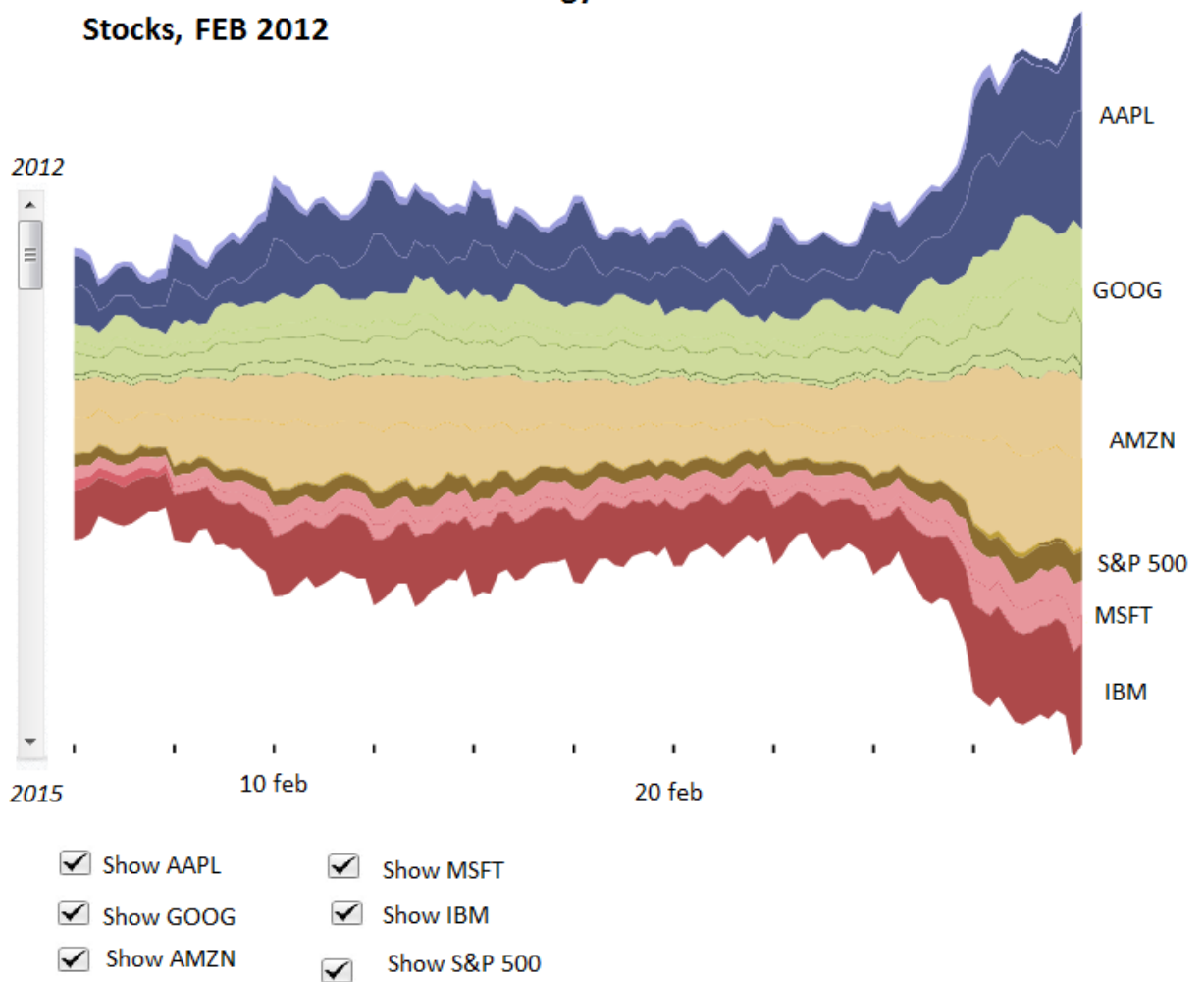
    The worst of all the visualisation figures is that of the squarified treemap. The pros of using this map is that it saves space, when compared with the other examples given, and that the size of the elements is derived from the actual size of the file it represents. The size is given in area though, which makes it more difficult and less accurate to read, when compared to only a

single length. One of the cons is that it is difficult to see to which map the individual elements belong. The enclosing maps are presented as lines enclosing the elements, with a different shade of blue for each layer of enclosement. The idea of the coloring is good, but in the example the different shades just don't stand out enough to be seen in a single blink of the eye. You need to follow the lines carefully to see what's in a map and what isn't. Another con is that the names of the elements can't be seen, as the space is too small to display the whole names of the elements. The last point of improvement is the interactivity of this visualisation, which is non-existent.

5. Play around with the interactive graphs included in the Heer article. You need to open this page in a browser that runs Java. Focus on Figure 1A. To what extent do interactivity and transitions, elements that D3 optimizes, add to the clarity and message of the visualization? With the element of interactivity in mind, redesign and sketch the contents of figure 1A with one of the other visualization types described in the Heer article. Include a picture of a sketch of your idea, and describe how it supports comprehension and data exploration.

   In the 1A interactive graph, the relative magnitude of gains or losses of money invested during the selected reference month is shown. The graph shows a couple of colored lines, each for a different company, with the x axis depicting the times in the month, and the y axis showing the magnitude of the gains and losses. When the mouse cursor is moved horizontally, the month which is viewed changes, with the lines of the graph and the marks on the y axis showing different data. The change of graph is very abrupt and zero tolerance, a single pixel to the left and the whole graph is replaced for another. This make the interactivity feels clunky.

Index Chart of Selected Technology Stocks, FEB 2012

2012

2015

10 feb

20 feb

AAPL

GOOG

AMZN

S&P 500

MSFT

IBM

☑ Show AAPL   ☑ Show MSFT

☑ Show GOOG   ☑ Show IBM

☑ Show AMZN   ☑ Show S&P 500

I would choose a stacked chart for design, although we would need to have absolute data for that to work (because the values can't be displayed as negative values). I would make it so you can change the month with a scroll bar, with a tooltip when dragging so you can see which month you are at. This could also be viewed in the title. In the original visualisation, it's difficult to compare two different companies with each other because of all the colored lines, so I added some checkboxes in which you can check which companies to view. Last, I would add a tooltip when you hover over one of the layers, so you can see the value at that time, or maybe even a vertical line with tooltips of each layer with their value.