CF Specialization, 2.1 – Tools for Creating Dashboards

1. A dashboard is not the best way to demonstrate findings for non-repeatable or infrequent ad-hoc reporting tasks or variance analysis. These situations need process-related documentation to support the analysis. If KPI dashboards show unexpected results, a system investigation is necessary to explain the cause(s) in detail and perhaps provide reasoning as to how to act proactively going forward.

   To report on variance, I would instead focus on non-interactive or static visualizations created in Excel using up to date exports, which could then be presented in MS Word with accompanying text explaining my investigation's methodology. A report/study-based format adds credibility to the conclusions reached and can be easily shared out to stakeholders to read if they want further information.

2. Food Consumption Characteristics of the European Union: https://dash.gallery/dash-food-consumption/ - Maximilian Maukner (m20200645@novaims.unl.pt) - Ehsan Meisami Fard (m20201050@novaims.unl.pt) - Franz Michael Frank (m20200618@novaims.unl.pt) - Steffen Hillmann (m20200589@novaims.unl.pt)

3. In my opinion the dashboard is successful because of how intuitive it is to interpret the data being shown – There are multiple points of interactions that seamlessly update charts showing values like correlations, choropleth maps, box plots etc. The data is slightly skewed towards a more technical / research-based mindset as it's exploring relationships between variables as opposed to be an operational dashboard simply showing system values.
   It's extremely legible and gives the user the ability to glean values immediately if they want to (e.g Min/Max/Mean) or instead hover over specific regions to self-serve their own insights.

   CF Qs:
   a. **What are the main elements in the dashboard that convey the information?**
      - Choropleth Maps (inc. Min-Max call-outs/hover effects) – used to visualize regional nutritional values for variables such as meat consumption, alcohol consumption etc.
      - Multivariate Bar Charts – to show side by side values for regional health values (e.g life expectancy)
      - Scatterplot w/ Trend lines + Colour-graded Correlation Coefficient
      - Box Plots

   b. **What makes the dashboard visually pleasing?**
      The dashboard is visually appealing because of its simple layout which keeps each element in its own tile preventing any overlapping or merging between visualizations. The colour scheme is consistent and is limited to only a few shades at once, so we are never overwhelmed by the quantity of different values or variables.

   c. **What's the informational value of this dashboard?**
      I think that the dashboard's information is straightforward and easy to interpret. Each section is clearly titled and comes with its own mini-introduction indicating what it is showing, and what elements are interactive/how to filter. Each visualization comes with clear scales and legends which enable the user to understand the content swiftly.

      I would say that the only point of criticism I have is on the section titled 'Analysing the correlations between food consumptions and health'. The introduction of box plots /violin plots to the side of the main graph are visually quite jarring and there is no visual legend to indicate that GDP is a new characteristic being plotted (graduate symbols).

d. How flexible and interactive is this dashboard from a user's perspective?
The dashboard is extremely interactive, allowing the user to self-serve specific nutritional or health variables that of interest to them. The visualizations update instantly, inviting the user to keep on filtering through new options to see the changes. Each section is not linked however, so any interactive elements are contained to the specific tile they were selected in. This can make some of the visualizations a little cumbersome, but because the dashboard is made up of 4 distinct elements/sections, I think the dashboard steers the user through a narrative where they can draw their own conclusions/insights.

4.

a. DASH
- Built on top of Plotly, Dash seems to offer a user friendly and highly customizable experience for those with experience using plotly, or for those with knowledge of web application development.

- However, for those without experience with web app development, or the library that acts as it's foundation, Dash can be quite difficult to learn because its syntax isn't entirely pythonic, instead incorporating HTML/CSS/JS into the mix.

- Has an extensive community and continued support thanks to its backing by Plotly.

- Has enterprise features that enable a higher degree of scalability compared to either of the other 2 libraries below.

b. PANEL
- Offers versatility and flexibility, due to it supporting a wide range of plotting libraries (Bokeh, Matplotlib, Plotly) and contains many interactive components which make for feature rich dashboards.

- Seamlessly integrates into jupyter notebooks/lab allowing for dashboards to be generated in the notebook environment.

- The quantity of options is a double edge sword, as Panel is supposed to have a steeper learning curve, often with less community support compared some of the more popular options included here.

- The range of features scan also hinder performance, meaning that it may not scale up to some high-volume datasets.

c. STREAMLIT
- Streamlit has the edge when it comes to simplicity and speed for those with limited experience in web app development.

- Offers fewer customization options and appears to also have performance constraints which limit the complexity of the datasets or visualizations created.

- Well integrated with the usual Python libraries and despite being a fairly new, it has a rapidly growing community pushing the tool along.