Visualizing the Quality of Life: part 1 – Technical Report

Please use this template table to describe and justify how you addressed the assignment and your application of visualization skills and techniques. Techniques that are correctly implemented, but not correctly described in the table will not receive full points. Please add any references that you use after the table; these should be cited where appropriate in the reporting. Your report (second column of the table) can be up to 1000 words, excluding references.

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Task	Description of how you addressed the task
Describe the data pre-processing steps carried out prior to visualization.	1- OECDData - Filling in missing values: This was done using excel through the OECD website and loading a wrangled version of the dataset in my Python code. 2- Time Series Data - Dropping columns with missing values: This step helps streamline the dataset, eliminating irrelevant or incomplete information that might hinder accurate analysis. - Filtering the database: Filtered the database to only include the indicator used in my time series chart and map and renaming the columns to match to make it more concise and avoid unnecessarily large amounts of data

Fit to task: Describe how the visualization support exploration and comparison of well-being in countries.	- The interactive bar graphs enable users to compare different well-being indicators through two dropdown menus. Users can select a specific country to highlight, and this selection is mirrored in the other bar chart, facilitating easy cross-indicator and cross-country comparisons. - The OECD Data Dashboard employs scatterplots to compare diverse indicators with life satisfaction as a reference point. This visualization method enables users to identify patterns and correlations between well-being indicators and life satisfaction. - The time series line chart is effective for examining trends over time, providing a historical perspective on well-being indicators. Users can track changes and identify potential influencing factors over the years. - The map serves as a visual summary, displaying the average of what the time series line chart indicates. This allows for a quick and intuitive understanding of regional patterns in well-being, complementing the detailed insights gained from the time series graph.
Fit to user: Describe what steps have been taken to ensure that the visualization is appropriate for the intended user.	For this visualisation, my intended user is the general public. In order to ensure it is appropriate, my design is simple with clear labels and titles for guidance. It is straightforward and easy to understand and interact with. It is accessible for most people with disabilities like colour blindness. The charts are commonly known and easy to understand and analyse for anyone with any type of expertise.

Analysis: Describe how statistical patterns of relevance are presented in the visualization.	- The visual hierarchy of the bar graph facilitates quick identification of variations in well-being across different countries and indicators - Patterns such as clusters, trends, or outliers are easily discernible in the scatterplot, aiding in the identification of correlations or disparities. - In the time series the use of lines connecting data points emphasizes the continuity of trends, providing a clear narrative of changes over the years. - Color gradients or shading on the map highlight regions with varying levels of well-being, allowing for a quick understanding of geographical patterns.
Describe your use of visual channels in the visualization.	- Position: The horizontal position of the bars represents the magnitude of well-being indicators and allows for easier comparison across two bar graphs as opposed to 2 vertical bar charts next to each other. The scatterplots being close together also allows for quick comparisons. - Colour: Different colours are used to distinguish between countries in all of the charts except the map which has a colour scale to represent the average of an indicator across different countries. The use of colours enhances clarity. - Shapes: The shapes in the scatterplots and the time series represent different countries to aid with the colours as there are more countries than the 12 distinct colours. This helps with accessibility as it is more colour-blind friendly

Describe how you have made use of Gestalt theory and design principles.	- Similarity: Similar and consistent use of colors for the countries in the bar charts and scatterplots enhance grouping. - Proximity: Bars positioned closely facilitate association between indicators for a specific country. Data points close to each other on the scatterplots indicate relationships, following the principle of proximity - Continuation**:** In the time series chart, the lines connecting data points emphasize the continuation of trends over time. - Simplicity: My charts all support simplicity with a clean and straightforward design, avoiding unnecessary embellishments that could distract from the data. - Emergence: They all also support emergence as they can all be filtered out to allow users to explore specific attributes for detailed information. - Past experience: My time series dataset makes use of past experience by presenting data on a timeline from left to right, aligning with the typical reading direction in many cultures. - Figure-ground: Clear distinction between selected data and the rest of the data in the bar chart and the scatterplots.
Describe your use of colour in the visualization.	- For the colour scale of the scatterplots, the bar charts and the time series, I am using the colour scale in Vega - Altair called paired which is a categorical colour scheme used to encode discrete data values, each representing a distinct category. - My map is showing a Sequential Multi-Hue Scheme called inferno from Vega Altair library as the map is representing a quantitative value and use additional hues for more colour discrimination.

Describe the interactive features used in your visualization, and how they facilitate exploration.	- Filtering helps users concentrate on relevant information, eliminating noise and enabling a more detailed examination of specific subsets of the data. - Zooming and panning provide a scalable exploration experience, allowing users to inspect both the overall structure and finer details of the data. - Hovering and tooltips (map) allow users to quickly access detailed information without cluttering the main visualization, enhancing the exploration experience. - Interactive legends allows users to focus on specific data categories and adjust the visual representation according to their analytical goals. - Dropdown menus allow for customization which empowers users to tailor the visualization to their specific needs and preferences, enhancing the overall exploration experience.
Describe the design of the multiple coordinated views visualization, and how it facilitates exploration.	The multiple coordinated views visualisation allows the user to compare different indicators with a common indicator (Life satisfaction) to clearly identify trends and what views are correlated with that specific indicator. Users can interact with and analyze data across various dimensions, fostering a comprehensive understanding of trends and correlations in relation to the central indicator.
Describe considerations made in the use of language and text in the visualization.	The use of language and text is simple and concise for the intended audience (the general public) with clear titles and labels. It is legible and accessible with font size and colour contrast (black over white).

References:

- Chapman, C. (2018). Exploring the Gestalt Principles of Design: Toptal® . Retrieved from https://www.toptal.com/designers/ui/gestalt-principles-of-design#:~:text=The%20classic%20principles%20of%20the,been%20added%20in%20recent%20years.
- Gestalt Principles of Perception - 4: Common Fate. (n.d.). Retrieved from https://www.andyrutledge.com/common-fate.html
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- COLORBREWER 2.0. (n.d.). Retrieved from https://colorbrewer2.org/#type=qualitative&scheme=Set1&n=3

- Color Schemes. (n.d.). Retrieved from https://vega.github.io/vega/docs/schemes/
- How's life? (n.d.). Retrieved from https://www.oecdbetterlifeindex.org/#/11111411111