**Exercise 2 Report:** *Color Scheme Effect on Exercise 1 Visualization*

***Motivation:***

The visualization from exercise 1 uses the color identification channel to allow a user to differentiate between United Nation geoscheme subregions. This exercise intends to look at different color schemes to determine their effect on the effectiveness of the visualization.

***Data Augmentation:***

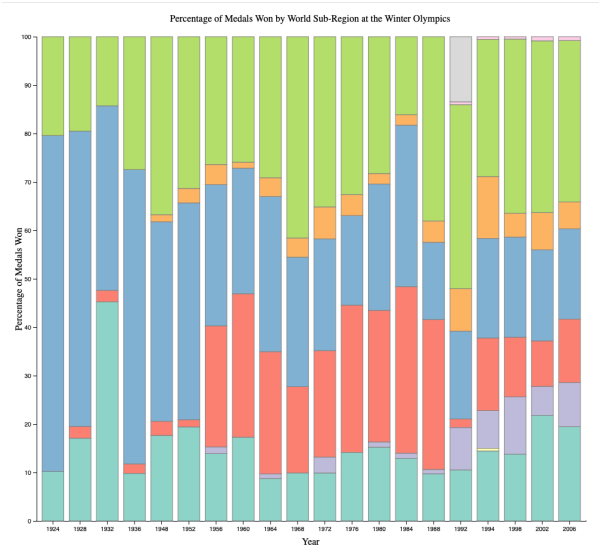
The data was prepared in the same way as in exercise 1. The only change is the color channel to identify the subregions in the chart.

***Tasks:***

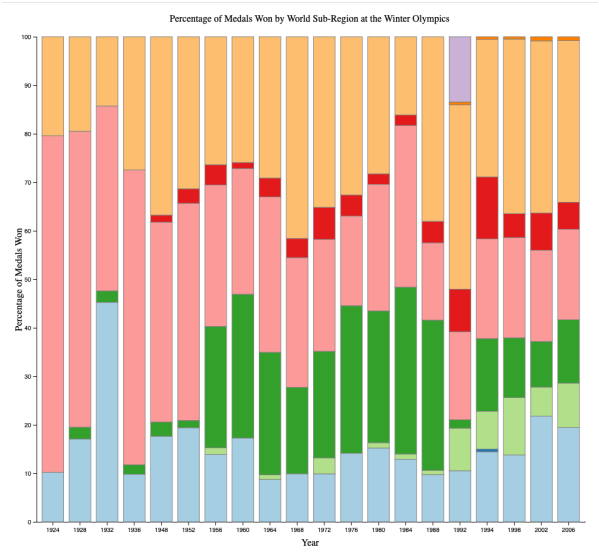
Using the same visualization from exercise 1 does changing the color channel scheme require other changes to the visualization to maintain the same fidelity?

***Expressiveness of Design:***

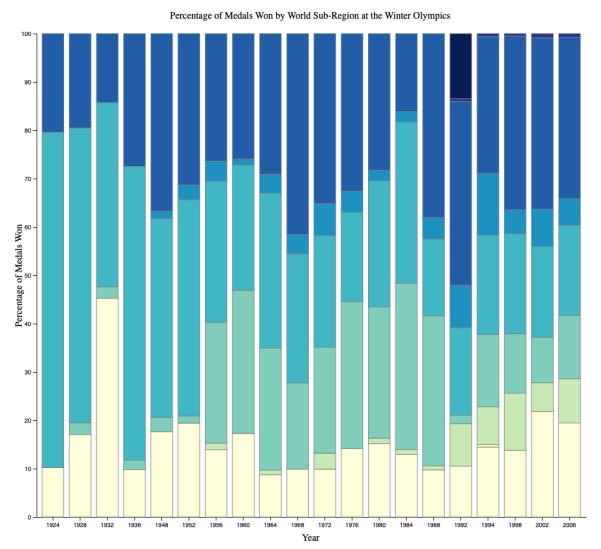
In the original visualization, the color channel was used for identification of different subregions within a stacked bar chart. The following images show how the visualization changes with different color schemes. The images show the visualization using the original categorical Set 3 scheme, the categorical Paired scheme, sequential multi-hue YlGnBu scheme, and diverging RdYlBu scheme.



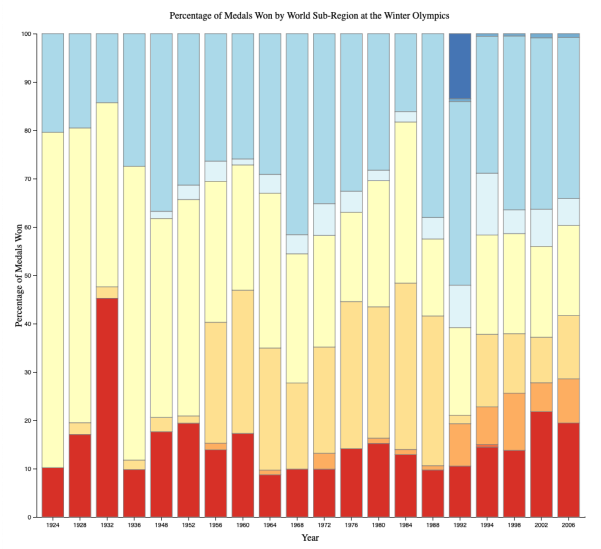

Set 3 Color Scheme




Paired Color Scheme




YlGnBu Sequential Color Scheme




RdYlBu Diverging Color Scheme

***Effectiveness of the Solution:***

The change in the color scheme changes how the data is read by the viewer. The data is categorical so it is logical that the categorical schemes will provide a more effective solution. The categorical colors easily allow a viewer to distinguish between the different regions without confusion. However, the paired color scheme may be more useful than the original Set 3 color scheme if adjusted. The paired categorical scheme can be used to pair together subregions of larger regions such as making all European regions use a red hue, American regions use a blue hue, etc. This would more clearly group subregions displaying even more detailed data in the same visualization.

The sequential and diverging color schemes appear to show some form of numerical change between the different bars in the stack. The bars are categories so these schemes can cause confusion on the purpose of the color channel. It may be initially interpreted that the colors indicate some type of connection between subregions that doesn't exist.

***Conclusions:***

It can be seen that changing the color channel can have a major change on the understanding of the visualization. In this case using a categorical color scheme is most appropriate to differentiate the bars in the chart. However, because we are looking at subregions of the world that are within larger regions, the visualization can be improved from exercise 1 by using similar hues to group subregions from the same continents. Care would need to be taken to ensure that the hues within a continent are still distinct enough to allow for accurately identifying subregions with adjacent bars.