# Exercise 2 Report: Top 10 Medal Countries at the Winter Olympics

## Motivation

Thinking about domination in the Olympic Games might conjure up thoughts of the gymnasts of China and the U.S. or the swimmers of Great Britain and Australia. However, the Winter Olympics tell a different story. Athletes from Germany and Norway seem to be consistently top performers in winter events. We wanted to build a visualization that captures the year-by-year performance of the top 10 countries and explores the effect of women athletes on a country's overall performance at the Winter Olympic games.

## Problem Statement / Task Description

The dataset consists of the medal winners for every sport in the Winter Olympics. We wanted to answer the following questions:

- Which countries dominate year after year?
- What are the distribution of medal wins for top countries?
- Do most countries stay consistent in their medal counts?
- As more women compete in more sports are there some countries that were positively affected with their overall medal count as a ratio with other countries?

## Visualization

The visualization is a sunburst plot in keeping with the Olympic medal theme. We used medal count as an ordered (quantitative) attribute to represent dominance of a country in the Winter Olympics. The magnitude channel for relative medal count was represented by the arc length of a circle. A hierarchical attribute structure was used to arrange the medal count by Country, Year, Gender of Athlete, and Sport. The arcs were sorted by year within each country. These hierarchical attributes were represented by concentric circles in the sunburst plot. When the user hovers the mouse above an arc, a tooltip annotation appears to display the medal count value as text. We chose a categorical color scheme (d3.scale.category10) to create separability and grouping of the country channel. Child arcs have the same color as their parent. The hue of the arc was darkened based on its distance from the center of the sunburst. The interactivity of the plot allows the user to click on any arc and zoom into that portion of the data for a more detailed analysis.

As a part of this visualization larger volume (or amount on ink) equates to more medals, and conversely less volume -less medals. The importance of medals won as a function of year is made salient to the user by the intensity, or alpha channel of the color used. This is to say that

more medals are not only encoded by volume, but also by opacity. This provides us with the ability to sort these medals by year.
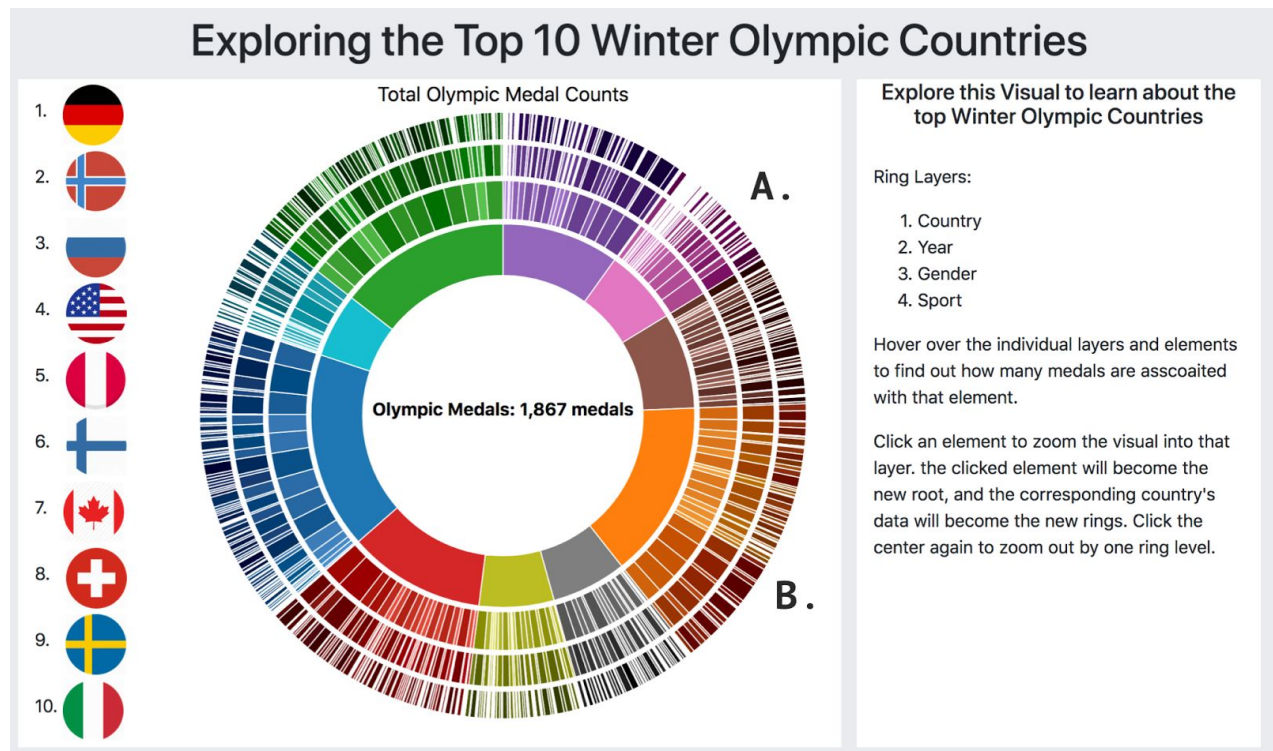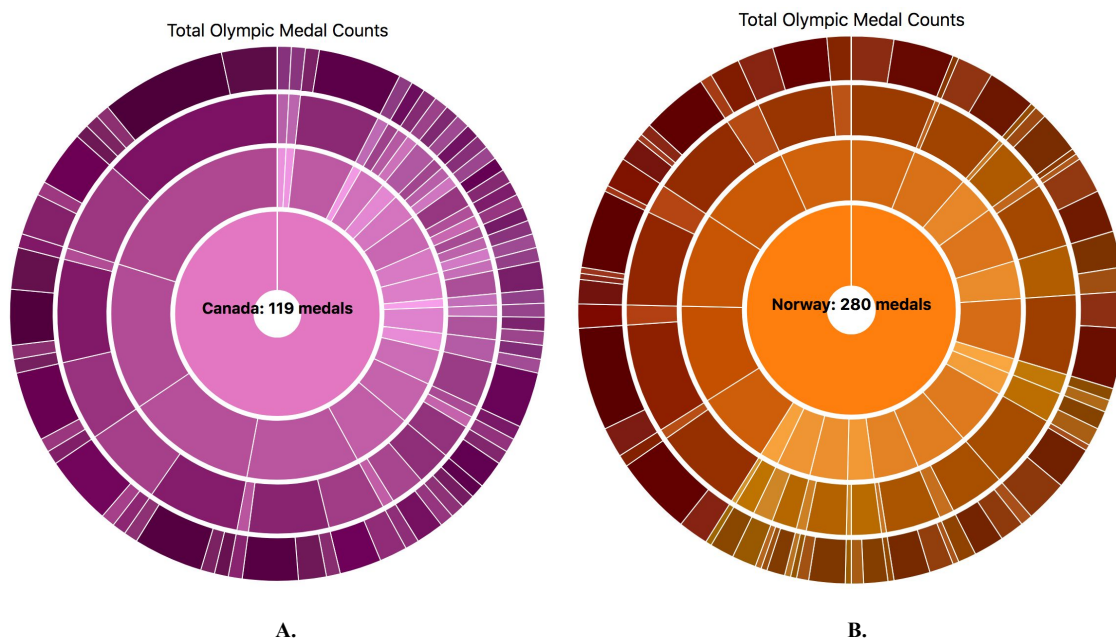


**Figure 1: Overall Visual**



**A.**                                                        **B.**

**Figure 2: Zoomed into Country Level (a) Canada (b) Norway**

## Data

We used a majority of the data provided to us, but combined West/East Germany into Germany and Soviet Union/Russia into Russia. Although the country's political environments were different, the same people and thus same talent pool of athletes were generated largely from the same population. Additionally, given the time constraints this provided us an easier route, though we still recognize the potential flaw in performing this data augmentation.

## Observations

From the visualization shown in figure 1, one observation is that the USA (red) and Canada (pink) trend shows an increasing number of medals in recent years. Contrasted with countries such as German (blue) and Russia (green) who have won steadily over the course of their appearances at the winter olympics. Color intensity, in the 2nd hierarchical level, provides a quick visual cue of a country's performance over a given date range. Notice how Canada has a more intense pink color in recent years.

In the case of Canada, show in figure 2A, and Norway, 2B, it is clear to see some interesting trends unfolding. For example both of these countries have a recent parity of M/F performances. Canada's current increase in medal counts is due to the increasing performance of their women's skating team. Norway's recent dominance in men's skiing has brought their country many new medals.