Communication Visualization Report

According to the article "Why is tiny Norway totally dominating the winter Olympics", Norway perform extremely well in Winter Olympics. How did Norway Performed so well?

The goal is to prove Norway did perform well in Winter Olympics and explore the attributes contributing to its performance.

1. Learning objective:

1.1 Recognize the principals.

In the visualization “All country rink count vs medal count”, the principal of higher medals is that the age of athletes is that the more rinks the country has, the more total medals it won in the previous Olympics.

1.2 Recognize the specific details.

In “Medal Count of top 5 counties over time”, there is a red line to emphasize the information of Norway. User can detect Norway without the need for focused attention. It fits into the Preattentive Processing.

In “All countries’ rinks vs medals”, the tooltip and the highlighting feature helps explore details a lot.

2. Dataset

1. Winter Olympics Medals

http://winterolympicsmedals.com/medals.csv

This dataset contains the records of Winter Olympics from 1924 to 2006. It has the fields city, sport, discipline, NOC, event, event gender, medal. The attributes used in the visualization is NOC, sport, discipline, event gender, as well as medal.

2. List of rinks

http://www.speedskatingstats.com/index.php?file=rinks

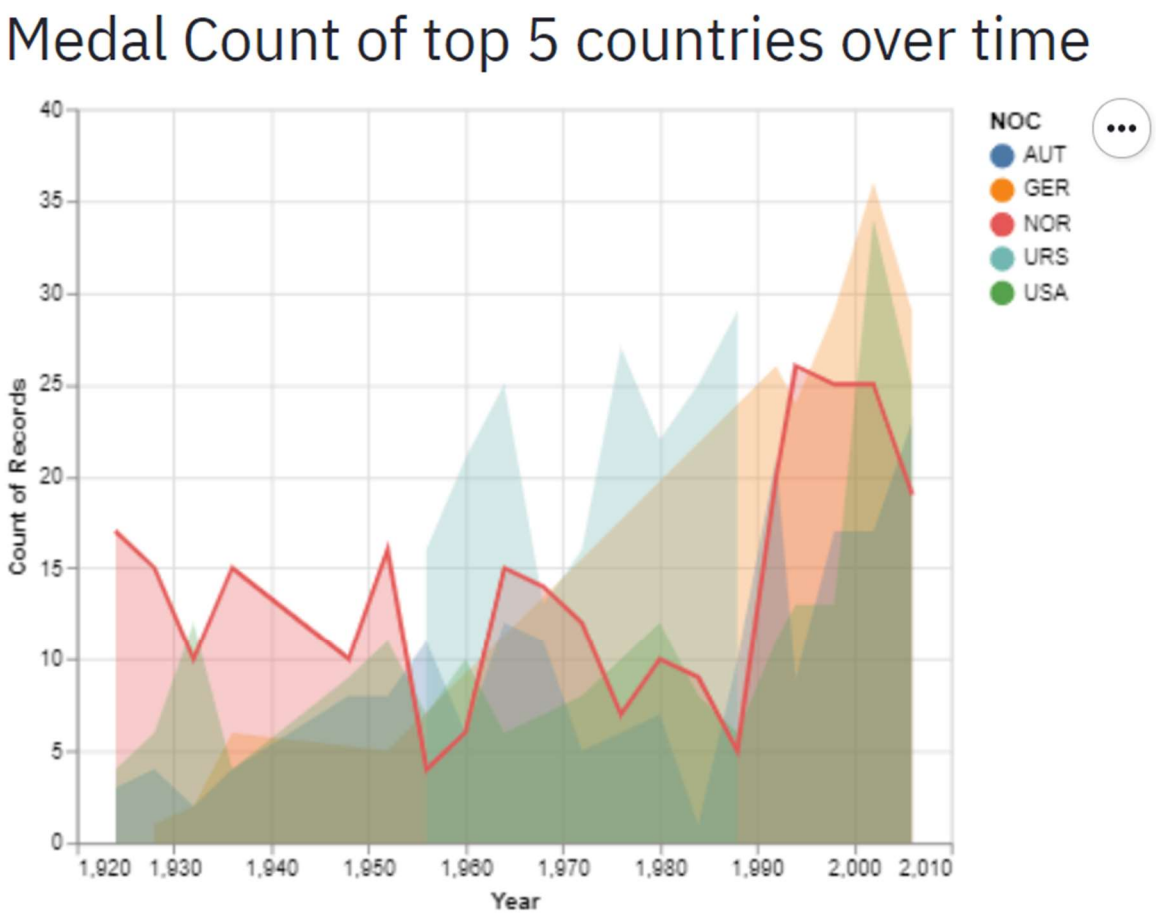
This data set contains the list of rinks all over the world. It contains the rinks’ places, NOC, names.

3. Design Process

3.1.Norway did perform well!

To explore the reason why Norway performs so well, the first step is to prove it did perform well in the Winter Olympics. So the number of medals of each country are calculated and ranked. The top 5 countries are visualized to see how the number of medals vary over time. From 1924 to 2006, the number of medals of Norway in each year always took a high rank, and it was never lower than top 5.

The transparency design is to avoid the hidden information because of overlapping. The red line is used to emphasize the info of Norway. So users can detect Norway without the need for focused attention. It fits into the Preattentive Processing.

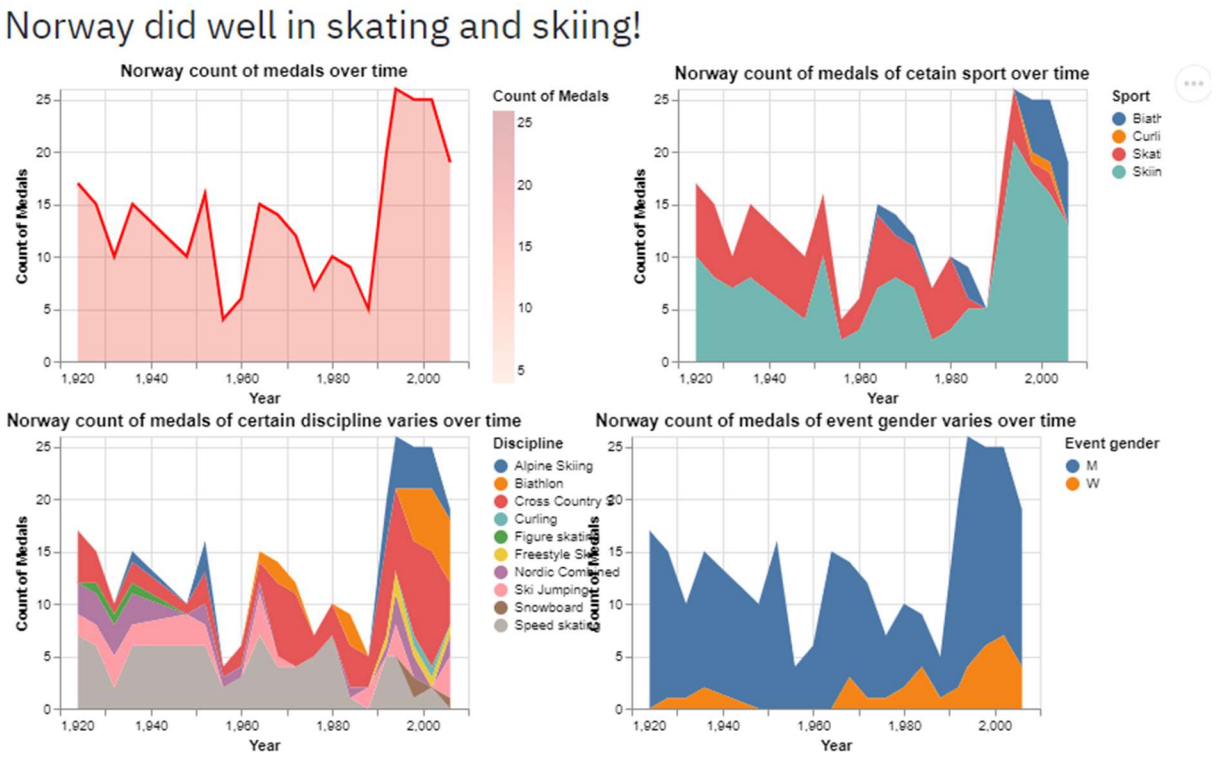


3.2. Norway performed best in skating and skiing!

What directly impact Norway's medal count in the Olympics? In this step, I explored the field sport, discipline, event gender. All those elements are in the same x-axis, the year from 1924 to 2006, as well as the y-axis, the number of medals of Norway each year in Winter Olympics.

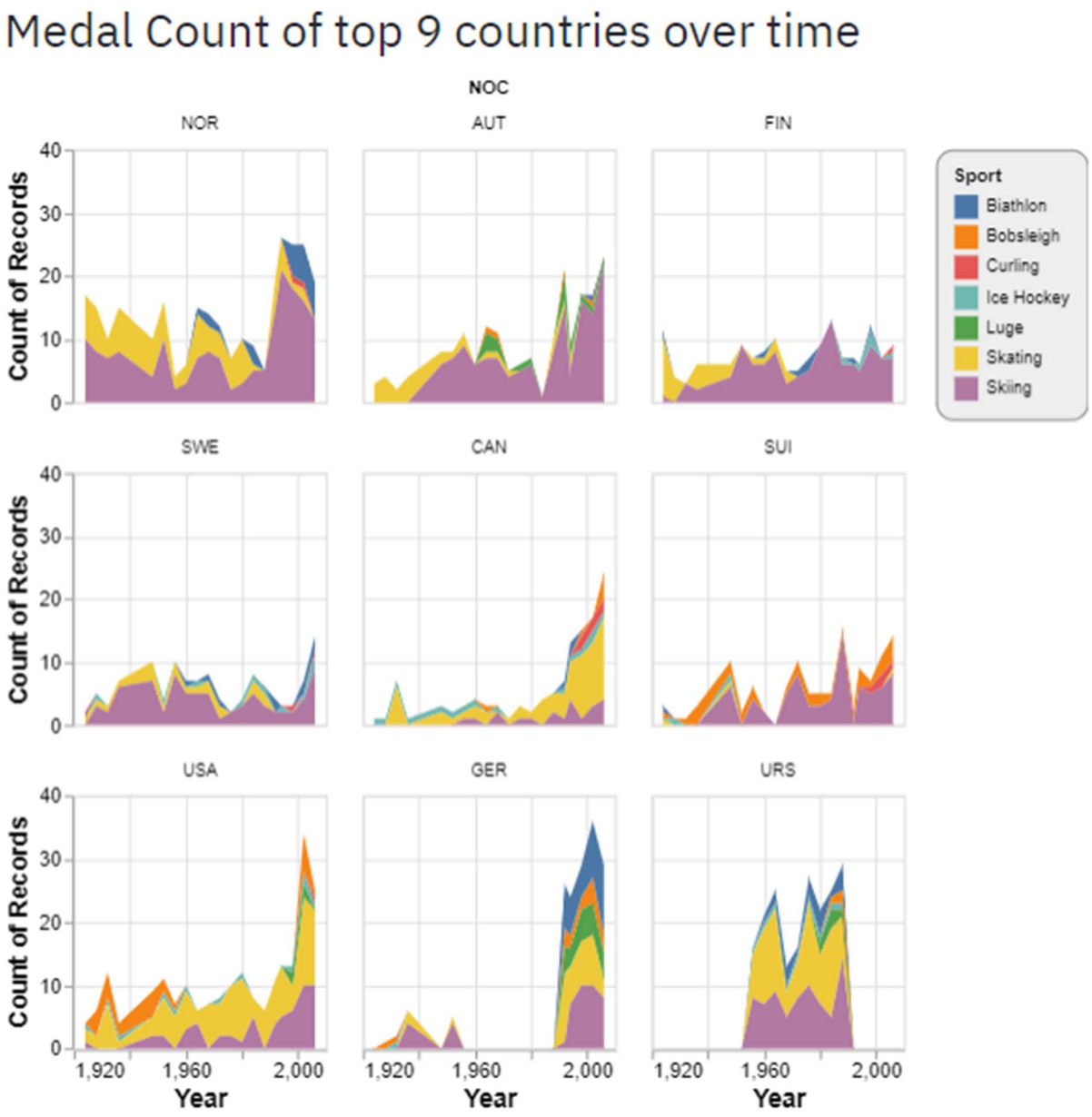
To be consistent, the first chart is part of the first visualization. The only difference is that it gets rid of the other 4 countries except Norway. So, we can see the number of medals of Norway in each year varies over time. The rest graphics encode the three fields into color.

In terms of sports, skiing and skating took the highest percentage of the total medals. This means that Norway performed well in skating and skiing! As for discipline, speed skating and cross country took the highest percentage. In event gender part, man won more medals than women in Norway.

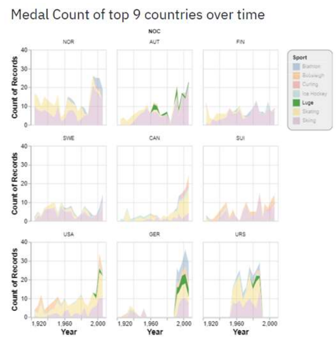


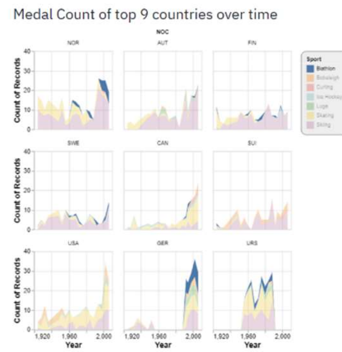
3.3.The best performances of top 9 countries are skating and skiing!

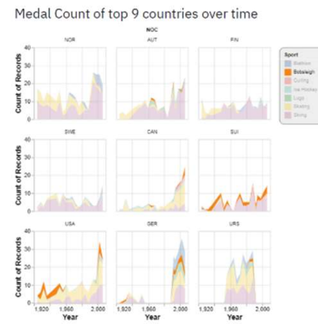
In the previous step, the one of the results is that Norway did best in skating and skiing. So how about other countries' best sports?
Different from Norway only won medals in four sports, other countries won medals in seven sports. But skiing and skating are still the sports they performed best in.

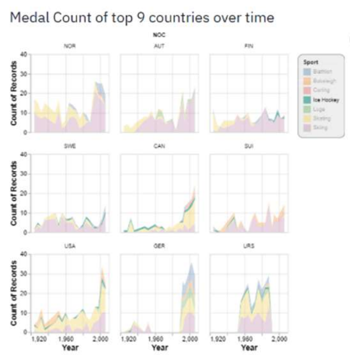


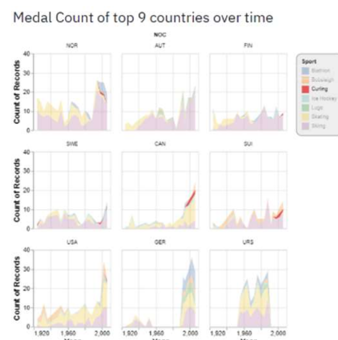
The interaction is added in this part. Users can click the area in the chart, so all the facets and legend will have the same color (sport) highlighted. Click the sport in legend, the corresponding part in the chart will also be highlighted.

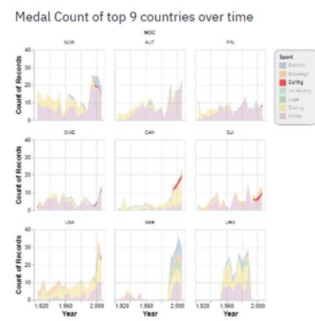


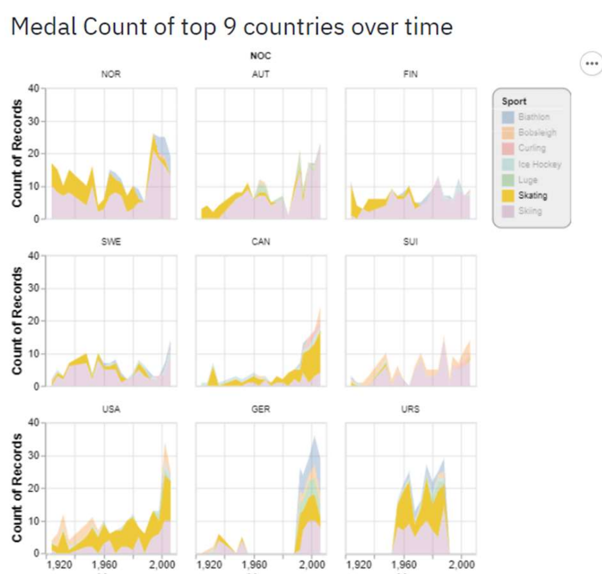


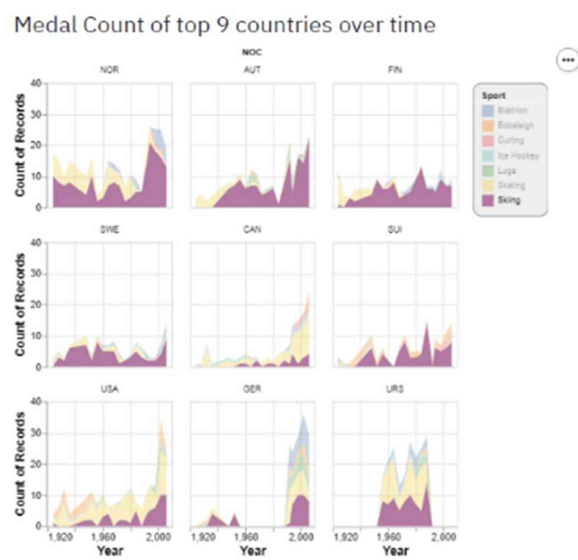










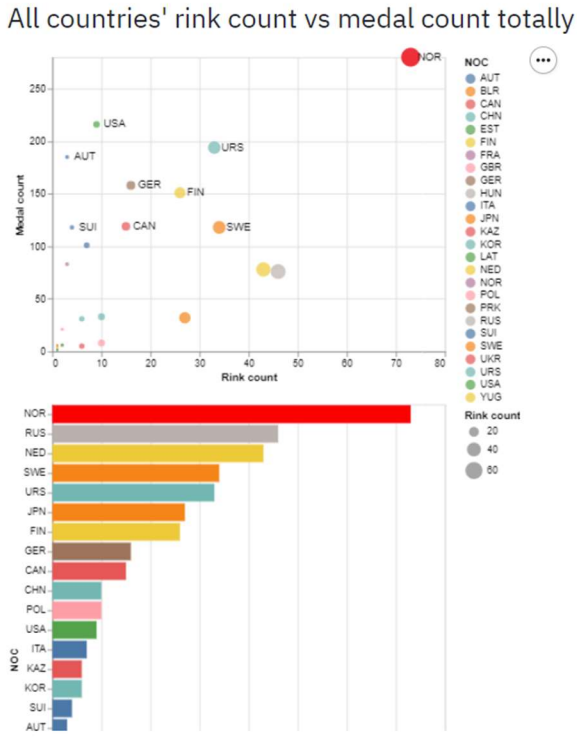


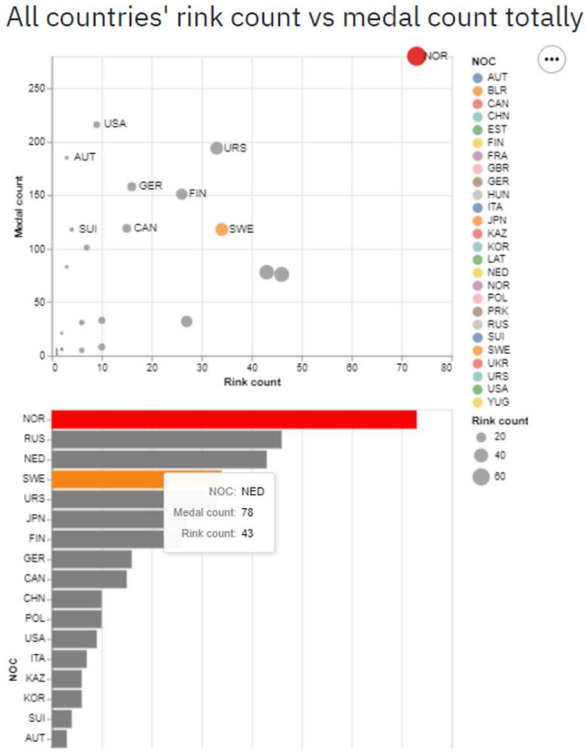
3.4. Having largest number of rinks in the world contributes to Norway's success!

Since Norway performed well in skating and skiing, so as other top 9 countries, the certain sport is worth exploring. The number of sportsground in one country can matters. Look at the number of rinks in each country, which affects the skating performance.

How many rinks does Norway have? What's the relationship between number of rinks and the medals in total? The bar chart is used to see the number of rinks Norway and other countries have, sorted to see the ranking. The scatterplot is used to see the relationship between rinks and medals, also the medal count is double-encoded in the circle size. The NOC is encode into color, for the interactive design. The two charts share the same attributes: color stands for NOC; x-axis represents rink count.

By click the circle, the same NOC in the scatterplot and bar chart will be both highlighted. It is easy to see the association. The same rule works when clicking the bar in the barchart. The information of Norway will always be highlighted. Tooltip is to show the NOC, medal count and rink count for each bar or circle.





I encode age in x-axis and the average medals per athlete of NOC in y-axis. Also highlight Norway in red.

4. Why final design is good

The story is consistent. First is to prove that Norway did perform well. The rest parts are exploration. The second step is to see the fields in the Olympics directly affect Norway's performance; this step has many results; I pick the sports to continue my exploration. In the worldwide range, I continue to explore the relationship between sports and medals. After the previous two steps, the conclusion that skating and skiing are the most important factor of the success in Winter Olympics has generated. The final step is to explore the number of rinks which indirectly affects medals but directly affects sports.

The perception is good. It follows ranking of perceptual tasks. Quantitative variables and Ordinal variable like year, count of medals is encoded in the position, which is highest ranking of perceptual tasks of them. Then the nominal variable like NOC or sports are encoded in the color hue, which is in the second ranking. Double encoding also applied. The line in the first chart, the circle size in the last chart, are double encoding to emphasis the nominal variables.

The interaction includes filtering, connection, and elaboration in graphics in 3.3 and 3.4. By click the certain field, the unit select highlighted and the rest become gray. Two different charts area connected not only by the same axis but also the highlighted elements. The tooltip in the last graphic can elaborate the details of elements while the elements are hovered over.

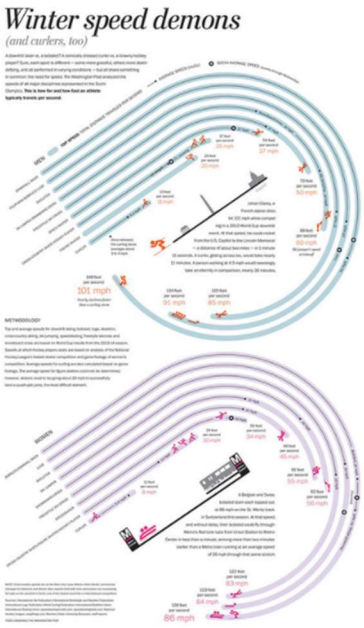
5. Evaluation

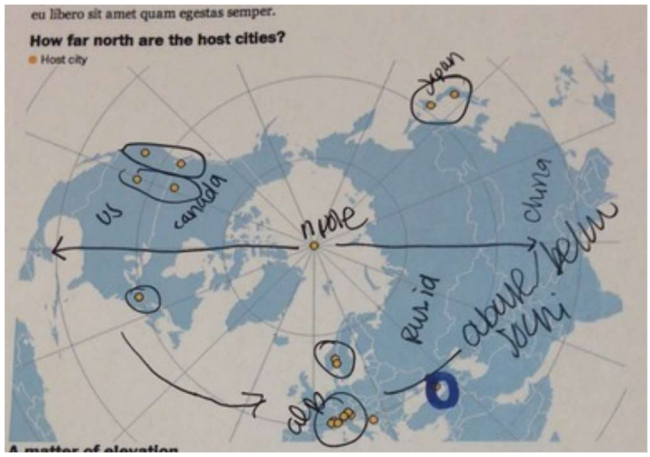
Make the expert and novice to use the browser to read the python streamline file. See if they can complete a set of generic retrieval tasks as quickly and accurately as possible within a large hierarchical data set:

1. Speed task: Set a time limit for them to read the graphics.
2. Accuracy task: describe things they remember. Answer the question: What is the element contributes to Norway's success in Winter Olympics?

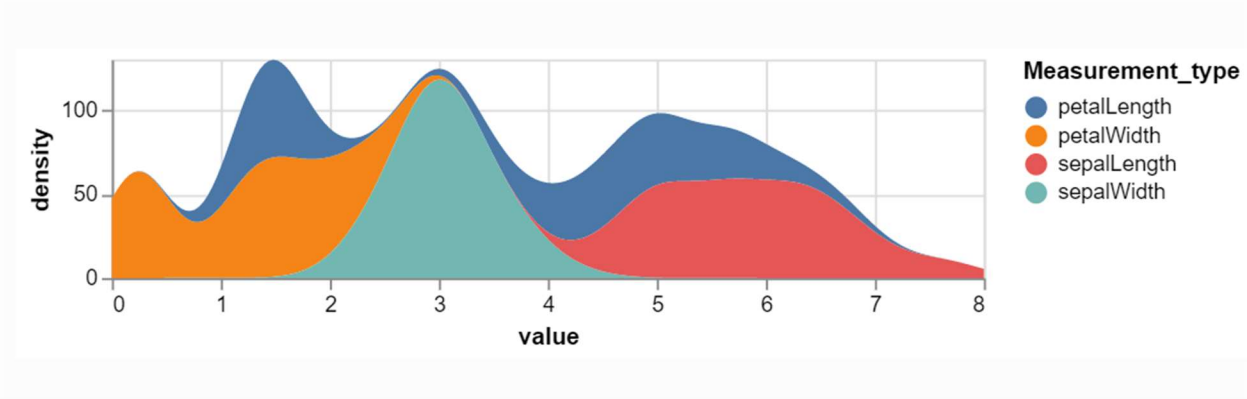
6.Inspiration:

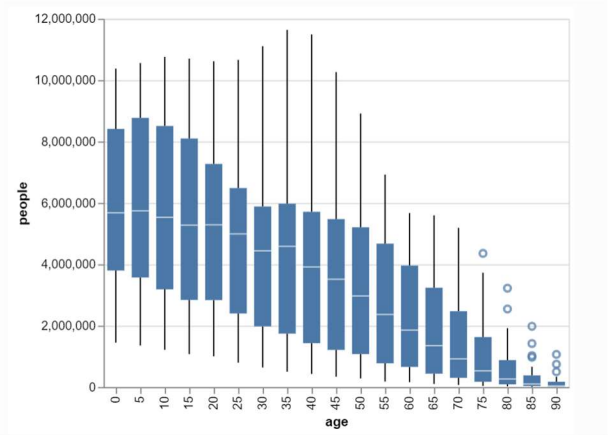
6.1. design

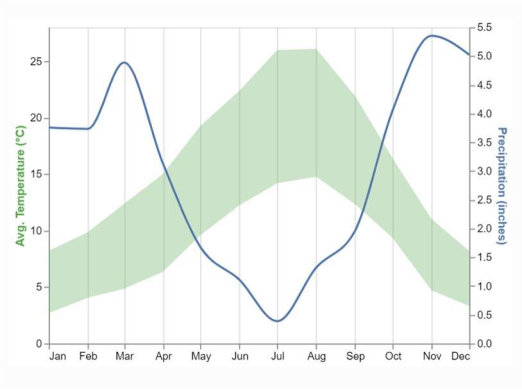


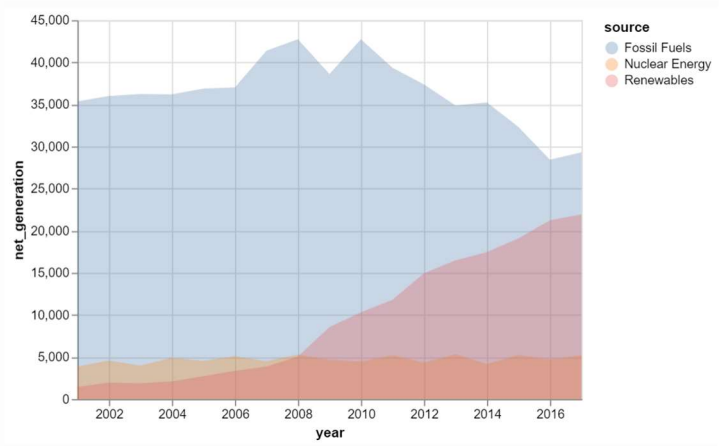


6.2. altair









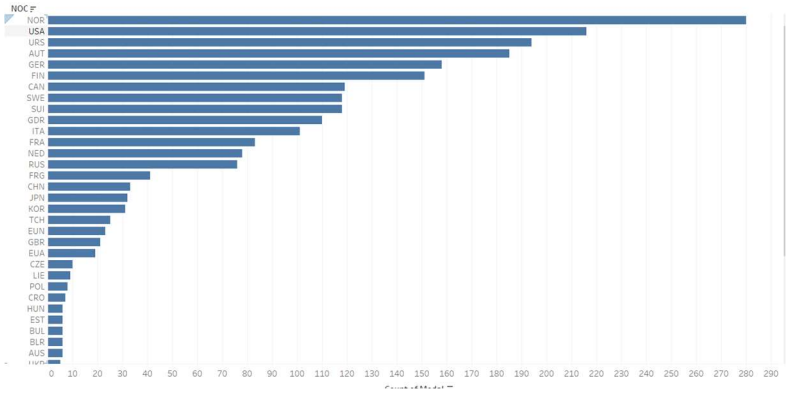
7. Other trying:

1. Top 5 countries in map. Draw a graphic on the first page, shows projection map with Norway's medals encoded in color and size, and other top 5 countries. Tried altair and ArcGIS but failed to apply my dataset to the map projection.

In [287]:
```
from vega_datasets import data
world = data.world_110m.url
alt.Chart(alt.topo_feature(world, 'countries')).mark_geoshape(
    fill='#2a1d0c', stroke='#706545', strokeWidth=0.5
).project(
    type='mercator', scale=400, translate=[100, 550]
)
alt.Chart(alt.topo_feature(world, 'countries')).mark_geoshape(
    fill='#2a1d0c', stroke='#706545', strokeWidth=0.5
).project(
    type='mercator', scale=400, translate=[100, 550]
)
```

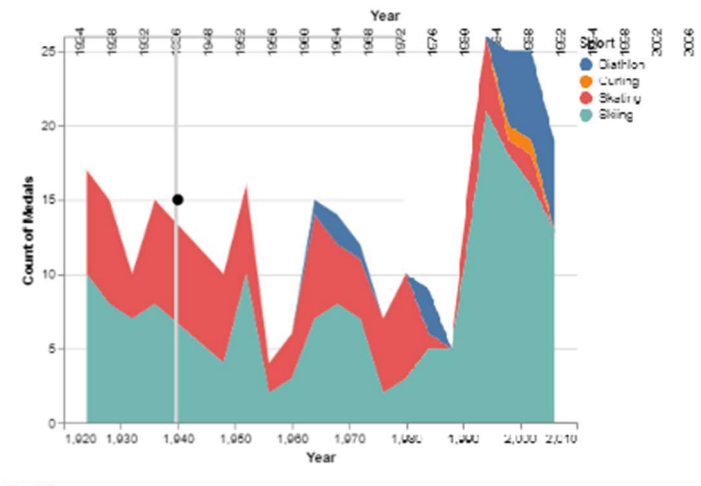
Out[287]:

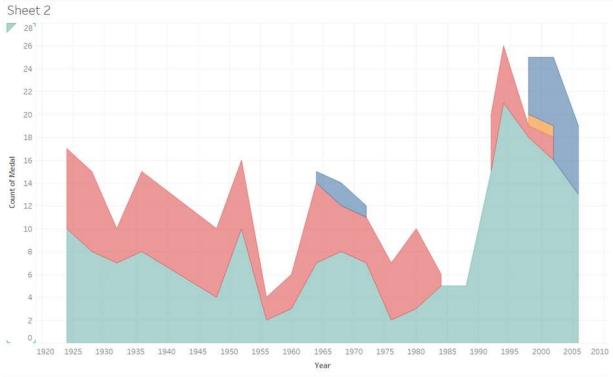
2. The total number of medals each NOC won. It is right one but quite boring. So I used area chart instead.



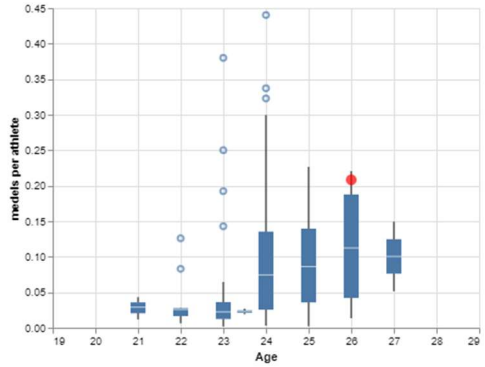
3. Count of medals Norway won over time. I tried to draw a vertical line and brushing it in my other three graphics. But It did not work when I concatenate four graphics. Also, the dots and lines doesn't fit right into the position in the colored areas.

Tried a Tableau version, but it looks not graphically perfect, so I came back to altair.

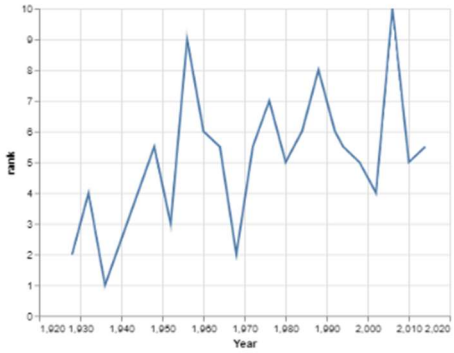




3. The relationship between the Medals per athelete can won in their countries. The read point stands for Norway, which has a medium athelete age 26.



4. Norway's rank of medal count over year. This dataset counts the overall medal of Norway not as the highest one. There might be some mistakes, so I used another dataset instead. Also Use the area map Norway always in the top 5 over time so I don't need to show vary of ranks anymore.



5. Norway's models won in each event. Event attribute looks not as much helpful as the sport attribute.