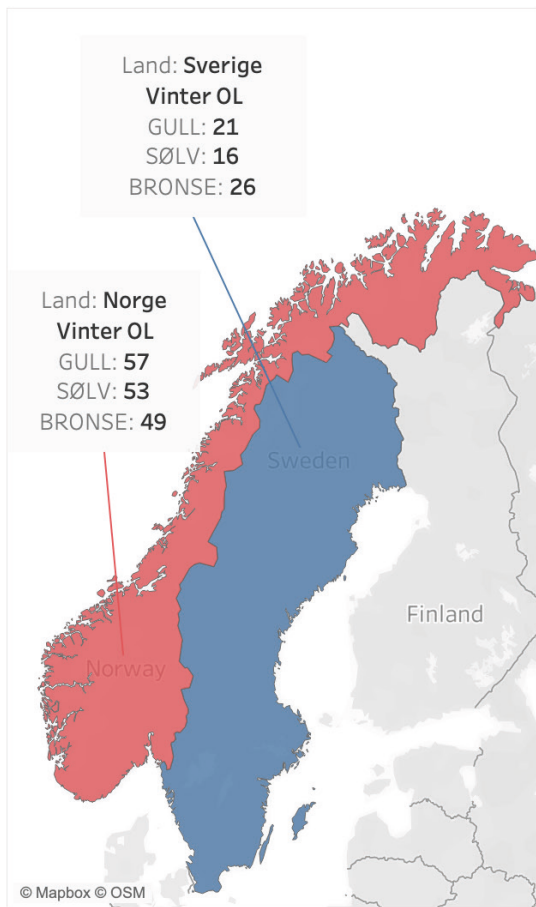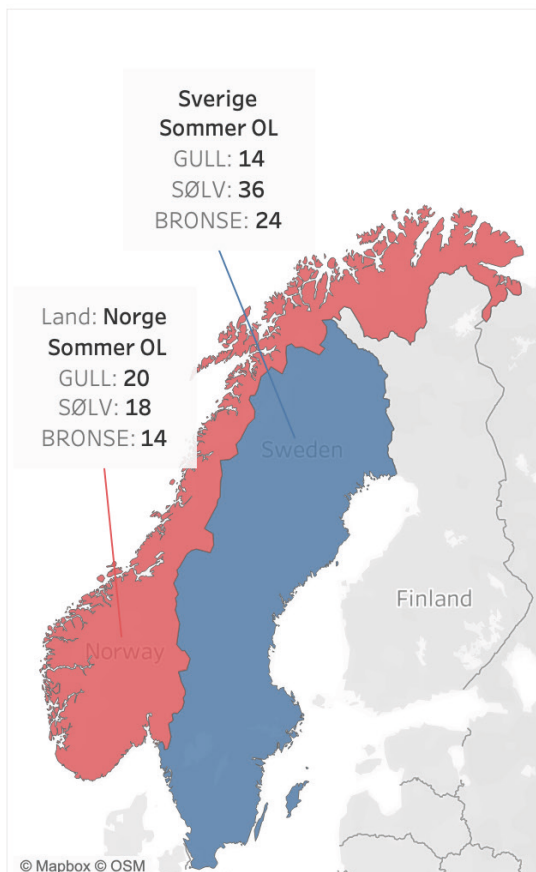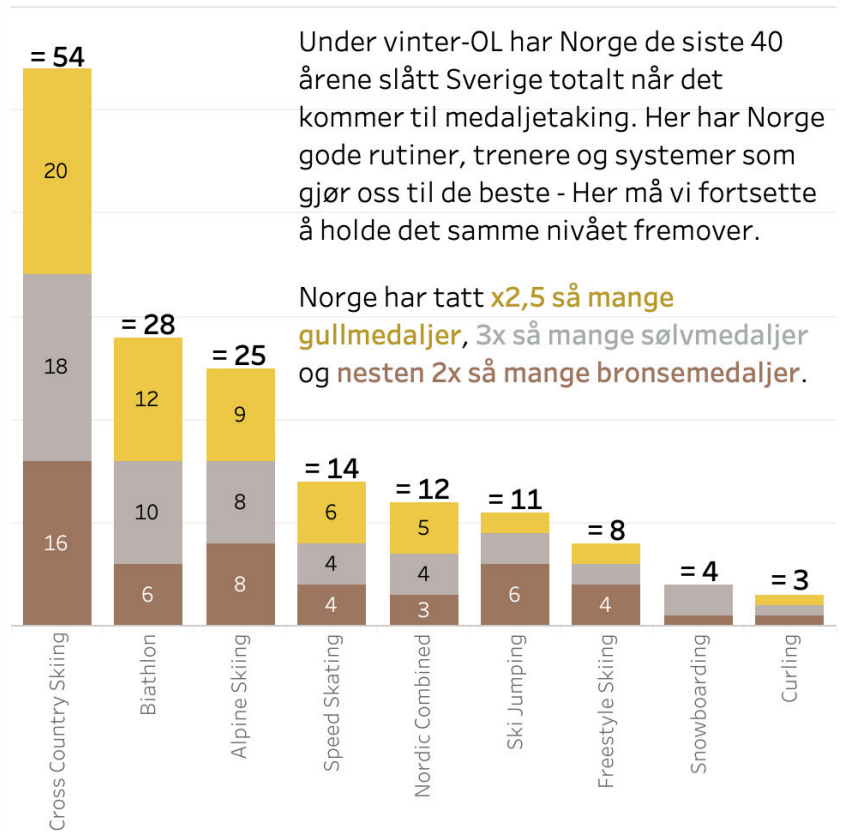**Page 1: Static data visualization for a full A4 page in a printed report**

Norges OL-medaljer (1986-2016)
Med sammenligning mot Sverige i samme tidsperiode

Land: **Sverige**
Vinter OL
GULL: **21**
SØLV: **16**
BRONSE: **26**

Land: **Norge**
Vinter OL
GULL: **57**
SØLV: **53**
BRONSE: **49**

Sweden

Norway

Finland

© Mapbox © OSM

Norges medaljer i vinter-OL

Under vinter-OL har Norge de siste 40 årene slått Sverige totalt når det kommer til medaljetaking. Her har Norge gode rutiner, trenere og systemer som gjør oss til de beste - Her må vi fortsette å holde det samme nivået fremover.

Norge har tatt x2,5 så mange gullmedaljer, 3x så mange sølvmedaljer og nesten 2x så mange bronsemedaljer.

Sverige
Sommer OL
GULL: **14**
SØLV: **36**
BRONSE: **24**

Land: **Norge**
Sommer OL
GULL: **20**
SØLV: **18**
BRONSE: **14**

Sweden

Norway

Finland

© Mapbox © OSM

Norges medaljer i sommer-OL

Norges har i sommer-OL ikke klart å holde tritt med Sverige, noe som har ført til at Sverige har 40% flere medaljer enn Norge (74 mot 52) over de siste 40 årene. Her kreves det betraktlig med arbeid mot fremtidlige OL for å begynne å snu skipet.

Sverige 2x antall sølvmedaljer og har 60% flere bronsemedaljer, selv om Norge har 50% flere gullmedaljer.
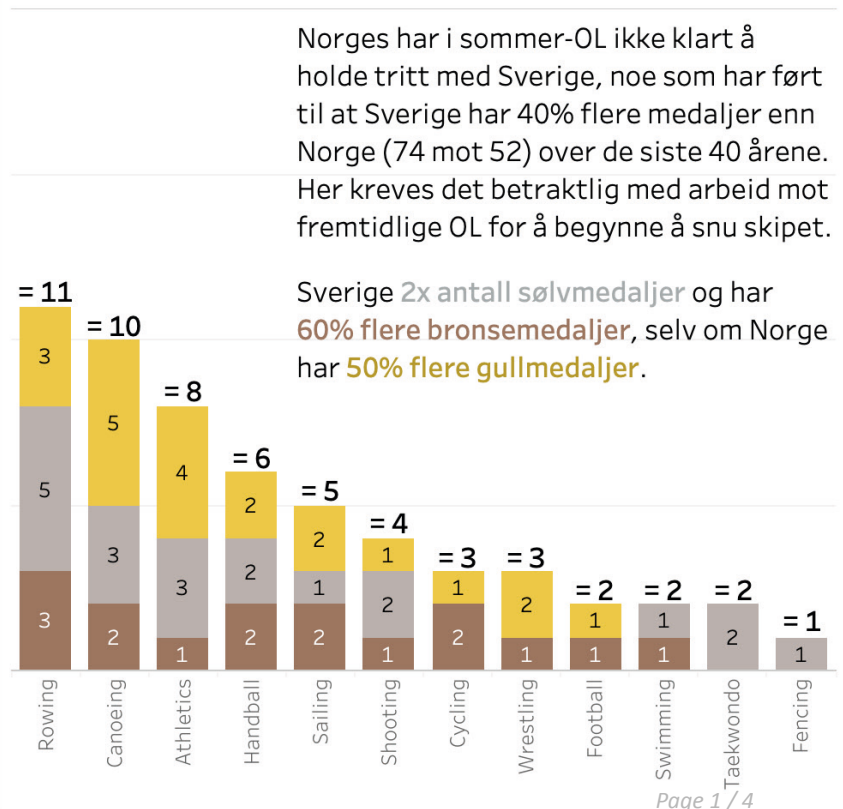
Page 2-3: Explanatory Text

Part a: Data Preparation

The first day we prepared and analyzed the exam datasets from Kaggle.com. The first file contains Olympic athletes data from 1896 to 2016. The second file included country codes (NOC) and names that we used to link the datasets in Tableau. During preparation we identified several issues:

- **Medals are saved on an athlete level**. The data has medals won by both solo athletes and team players. For the medal count to be correct we calculated the unique medals by taking into account year, season, team and event, counting these medals only once.

- **Use of "Team" column is unreliable**. Some teams are named "Country-1" and "Country-2" meaning the data is unsuited for being used as a country name. We focused instead on NOC.

- **Limited alphabet for athletes' names.** The dataset only includes letters from the English alphabet (A-Z). Because of this all names using special letters or accents are spelled wrongly (i.e. Kjetil André Aamodt shows "Kjetil Andr Aamodt"). (AADDLE, 2020).

- **Missing athletes.** The dataset is missing athletes, i.e. Bjørn Dæhlie (won 12 medals), affecting medal counts when compared to other sources. Because of time we didn't address this.

- **Merging country codes.** We identified 12 countries that had several country codes (NOC's) that for different reasons should be merged to give a correct medal count.

Part b: Relevance to the Case

Part A: An interactive dashboard by the entrance to Olympiatoppen designed to motivate Norwegian athletes and trainers arriving for practice. We chose to work based on the following assumptions as we found the exam text was a bit vague: 1) The dashboard will be shown on a 13" tablet that the audience can interact with using their fingers. 2) The dashboard is in Norwegian. 3) The dashboard is designed to give quick intrinsic value to all our audience, whether they are busy with no time to stop at all or have a few minutes to interact with the dashboard.

We designed three connected dashboards with growing levels of info as one goes deeper, using interactive buttons at the bottom to switch between them. They are created to give intrinsic motivation to the audience as the main goal is to help athletes perform better over time (Cohn, n.d.). The first dashboard has a positive, dynamic greeting that changes based on the time, a countdown timer to the next Olympics, and a changing slide that shows short informative text with dynamic numbers related to Norway's endeavors in the Olympics. The second dashboard details Norway's olympic results since 1900 through dynamic numbers and a stacked bar chart showing a time-series. The third dashboard shows a global comparison of all countries based on medals won by using a dynamic map and a table showing medals and ranking of the countries. Both the second and third dashboard have filtering the user can interact with to show the information they find most interesting (filtering by year, season and/or sex of the athlete).

Part B: A static data visualization for a printed rapport for Olympiatoppen's leaders. We chose to visually show the medals Norway have won during the period 1986-2016, split by season and sport, to give value to Olympiatoppen's leaders regarding decisions about future investments. We decided to show how Norway fare compared to Sweden as it is a comparable country to Norway. By using Sweden we make it easier to identify strengths and areas of improvement in different olympic sports. Our aim is to provide where Norway can optimize investments.

Part c: Explanation of Design Choices

For both parts of the exam we used stacked bar charts as it is an effective way to reflect quantitative values. Using a hierarchical chart type is good to show part-to-whole relationships, using the line marks to show medals won through variations in size by length (Kirk, 2019 p. 138). As the audience might be unfamiliar with the data before they interact with it, we focused on readability. Both charts use the Y-axis for the number of the medals won and the X-axis for quantitative measures. The different titles clarify what data is shown, so no Y-axis title is needed.

At the bottom of the dashboards there are buttons to navigate between them so the user can explore. On both the second and third dashboard there is a filtering menu on the side, where we use radio buttons to show the data most relevant to the user (Kirk, 2019 p. 204). It is possible to hide the filtering menus by a cross at the top right corner to give more space to visualizations. Also, on the third dashboard it is also possible to hide the data table on the bottom so the interactive world map gets more space to be explored by the audience using familiar gestures.

In both parts of the exam we have mainly used the preattentive attributes of size, case and bold to highlight what is important and draw focus. We have done this as our solutions are heavily based on text with colored bar graphs and this made it possible for us to focus on the data. We have worked on keeping our "visual affordance", making the visuals look clean and intuitive as we can't know the technical level of the future users (Knaflic, 2015, p. 129, 138-140).

Our data is sorted chronologically by year to expose patterns over time (medals won) to represent our data on the bar charts. Each bar represents an olympic game that Norway has attended with medals won split by type (Kirk, 2019, p. 281).

We have kept the color choices to a minimum, using either red and blue (from the norwegian flag) or gold, silver and bronze when affecting data that have to do with medals (i.e. the color of the text or the colors of a stacked bar chart). This way we keep the audience's attention, train them in how colors connect to data while also making sure it won't be a problem for color blind people where the biggest problem colors are red and green (Knaflic, 2015, p. 120-121).

To better inform the audience, we implemented tooltips to create a pop up display. Our chart's take up most of the screen space, so the tooltip addresses the spatial constraints. In addition, we also gave assistance to how the user can interact with the Dashboard (Kirk, 2019, p. 216-217).

Page 4: Bibliography and member contributions

For the exam all work on the two parts (dashboard and static visualization) and the writing of the report have been done while the group members have met and worked together at school. A large part of the work has been done in tandem, with both students working on the same thing on one computer or printing out the data and exam papers and, like analyzing and preparing the data sets and setting up the first Tableau Desktop file with the source data sets.

When we started working on the Dashboard for part A the group first made a plan for how we wanted the Dashboard to function and roughly look on paper, just drawing and writing notes. Then we split up the different parts and worked on one part each at a time in Tableau Dashboard. When a part was done we had one master file on member 15's laptop that we recreated the graph or visual in to avoid any problems with importing from other Tableau files.

We then used the same tactic for part B. First we wrote down what the goal for the visualization was and how to best answer it and then drew a rough sketch on how we wanted it to look. After that we started working on creating the different parts, having both members work on one piece at a time and then we put it together in the master file.

For the written report we first wrote one part each, then read over each other's parts to clean up the phrasing and paragraphs before we merged them. Then at the end we printed out the report and sat together, reading through and making last edits.

Bibliography

[AADDLE]. Kaggle: Discussion: Characters With Accents Missing [Discussion forum post for dataset used on the exam]. (2020). Kaggle: Your Machine Learning and Data Science Community. https://www.kaggle.com/datasets/heesoo37/120-years-of-olympic-history-athletes-and-results/discussion/185670

Cohn, P. J. (n.d.). *What motivates athletes?* Sport Psychology Articles for Athletes, Coaches, and Sports Parents. https://www.peaksports.com/sports-psychology-blog/whats-the-best-motivation-for-athletes/

Kirk, A. (2019). Data visualisation: A handbook for data driven design (2nd ed.). SAGE Publications.

Knaflic, C. N. (2015). Storytelling with data: A data visualization guide for business professionals. John Wiley & Sons.