Monash University: Assessment Cover Sheet

Student name	Goh	Chia Ching	
School/Campus	Monash University Malaysia	**Student's I.D. number**	32203004
Unit name	FIT3179 Data visualisation - S2 2023 MUM		
Lecturer's name	Dr Grace	**Tutor's name**	
Assignment name	Data Visualisation II Report	**Group Assignment: No** **Note, each student must attach a coversheet**	
Lab/Tute Class:	**Lab/Tute Time:**	**Word Count:**	
Due date: 15-10-2023	**Submit Date:** 17/10/2023	**Extension granted** ☐	

If an extension of work is granted, specify date and provide the signature of the lecturer/tutor. Alternatively, attach an email printout or handwritten and signed notice from your lecturer/tutor verifying an extension has been granted.

Extension granted until (date): ...../...../..... Signature of lecturer/tutor: .....

Late submissions policy	**Days late**	**Penalty applied**
Penalties apply to late submissions and may vary between faculties. Please refer to your faculty's late assessment policy for details.		

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Student Statement:

- I have read the university's Student Academic Integrity Policy and Procedures
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- I have taken proper care to safeguard this work and made all reasonable efforts to ensure it could not be copied.
- No part of this assignment has been previously submitted as part of another unit/course.
- I acknowledge and agree that the assessor of this assignment may, for the purposes of assessment, reproduce the assignment and:

  i. provide it to another member of faculty and any external marker; and/or

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- I certify that I have not plagiarised the work of others or participated in unauthorised collaboration or otherwise breached the academic integrity requirements in the Student Academic Integrity Policy.

Date: 17/10/2023 Signature: chiaching *

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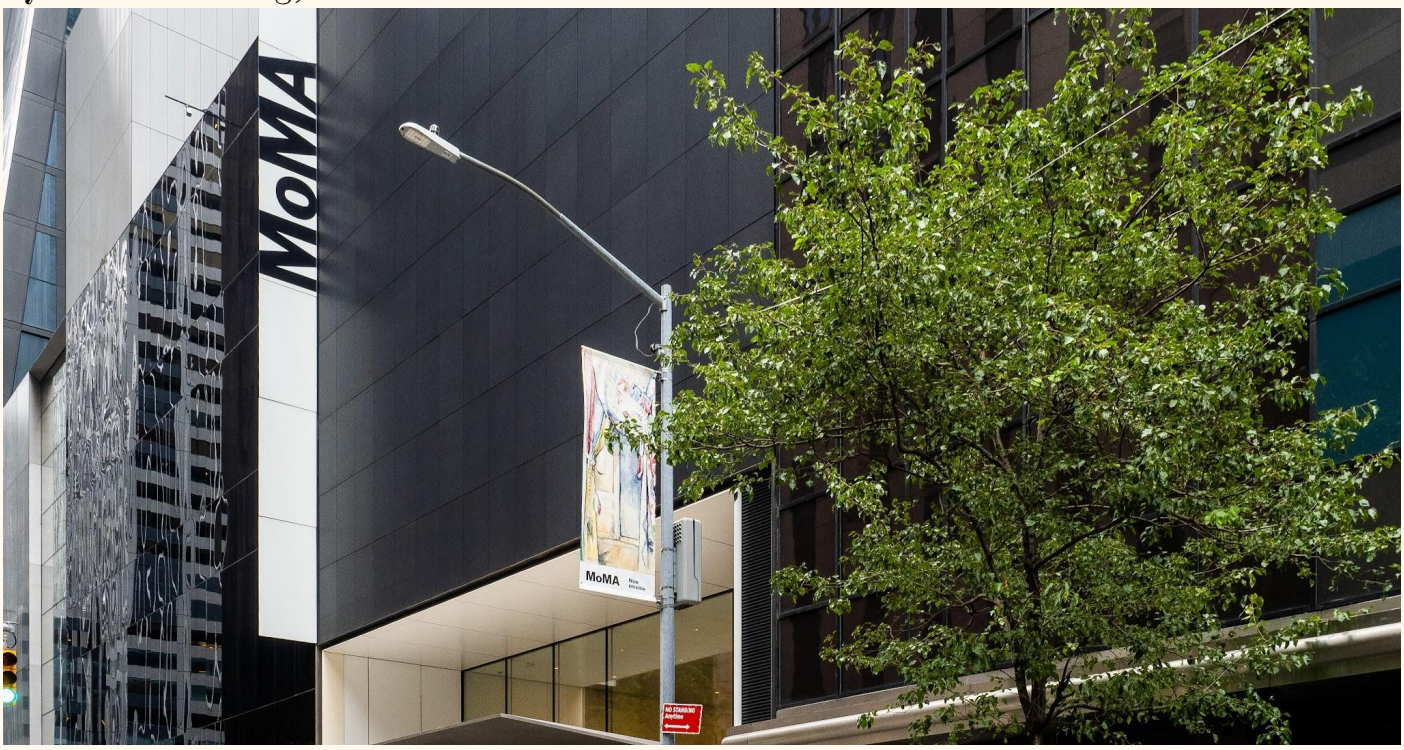
BIOLOGY PERIOD 1
MS. WENDY WRITER

FIT3179
ASSIGNMENT 2 REPORT

—

By Goh Chia Ching, 32203004



Student ID	32203004
Name	Goh Chia Ching
Tutorial	Thursday, 9am
Word Count	**986** excluding Image description, Titles and References
Link to Visualization	https://chiachinggg.github.io/FIT3179-Assignment-2-MOMA/
Link to Github	https://github.com/chiachinggg/FIT3179-Assignment-2-MOMA/

Table Of Contents

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Domain - Why and Who

The visualization focuses on **art and culture** and serves as a focal point for art historians and researchers delving into the evolution of artistic movements. This is also relevant to students, educators and the general public as they can better understand how the collection affects their perception of art.

What

The dataset was acquired from MoMA's GitHub (MoMA, 2023). It includes data on over 98,361 artworks and 27,140 artists, of which have been cleaned and sampled in R into 10,000 artworks to allow for fast processing. Data transformation was also done to allow certain charts to be created. The dataset includes information about the artwork, artist, date made, medium, dimensions, and date acquired by the Museum.

Idioms - Why and How

Idiom 1: Choropleth Map

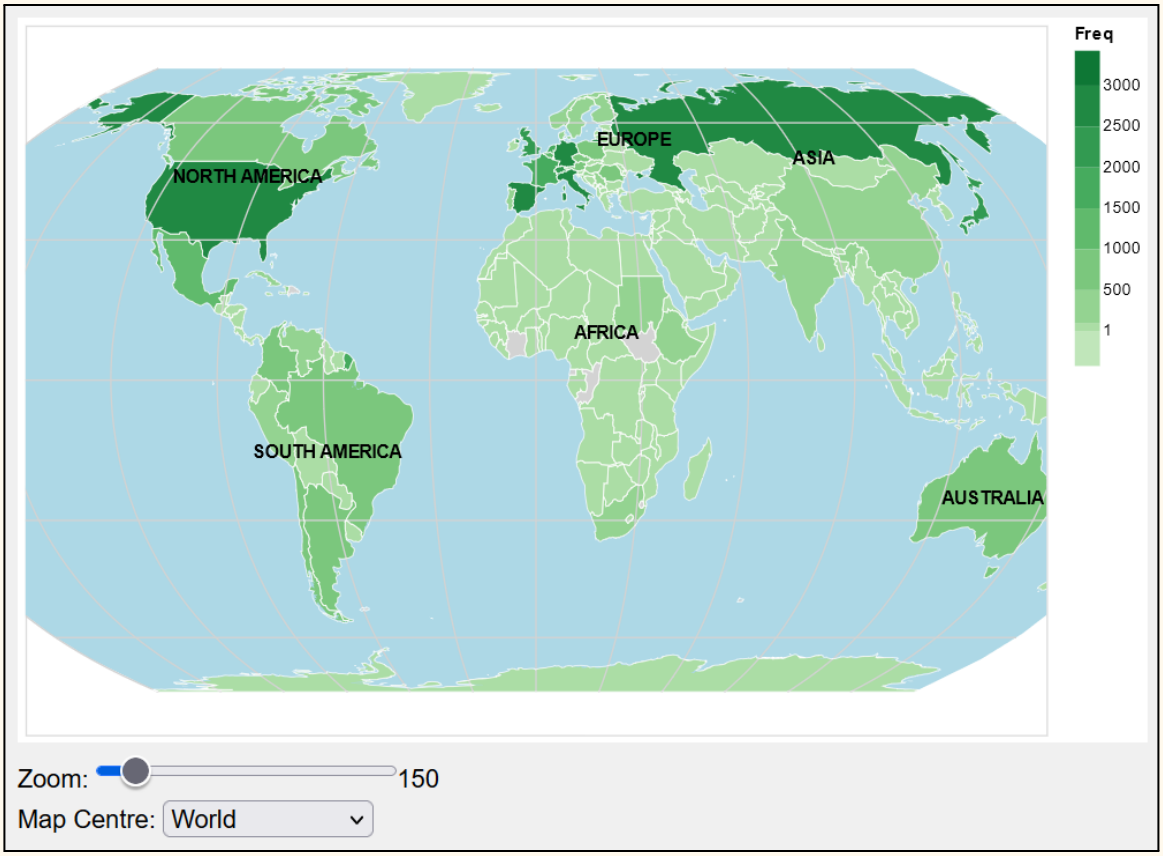

Figure 1: Choropleth Map representing the number of artwork produced per country overall.

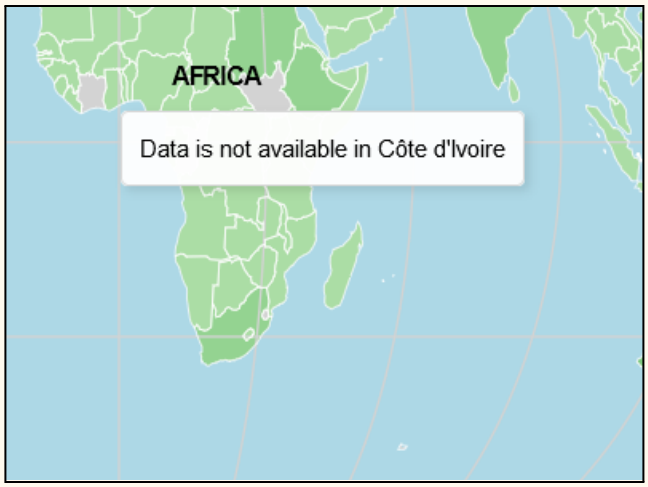

Figure 1.1: Feature 1: Tooltip interactivity showing unavailability of data

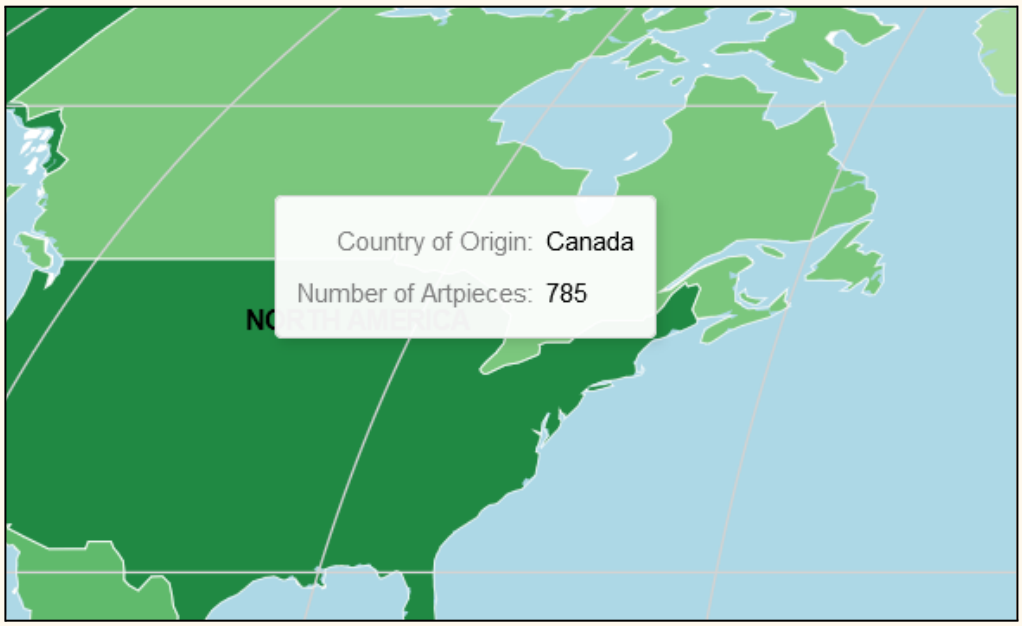

Figure 1.2: Feature 2: Tooltip showing data

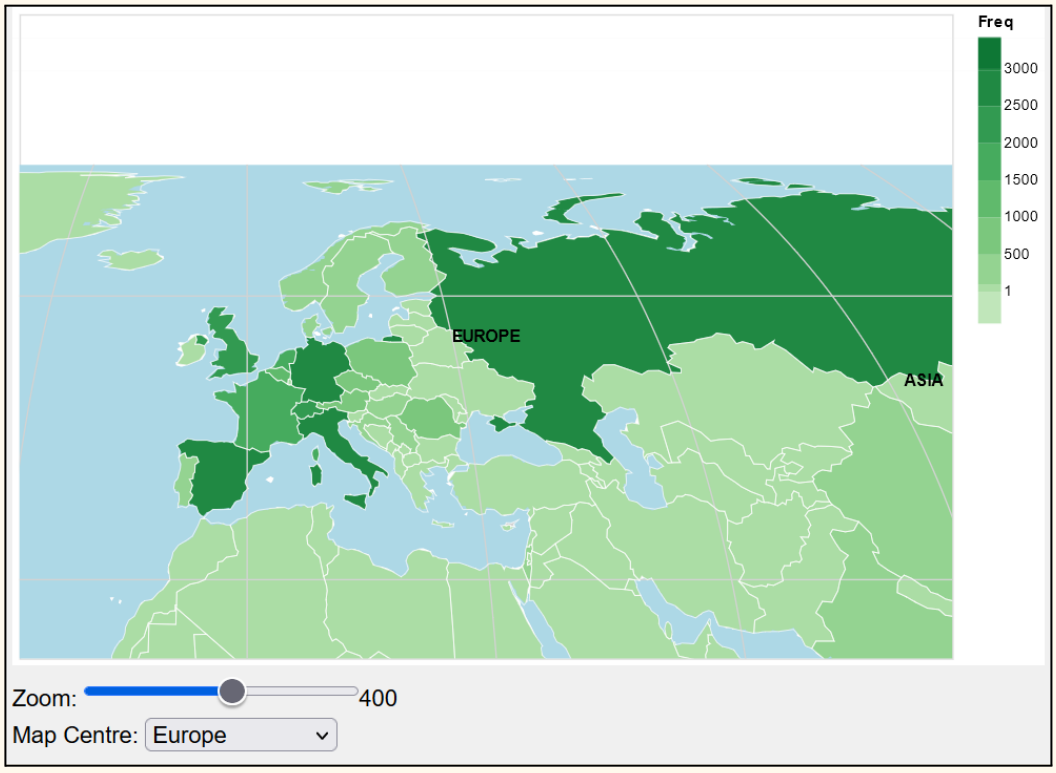

Figure 1.3: Feature 3: Zoom interactivity

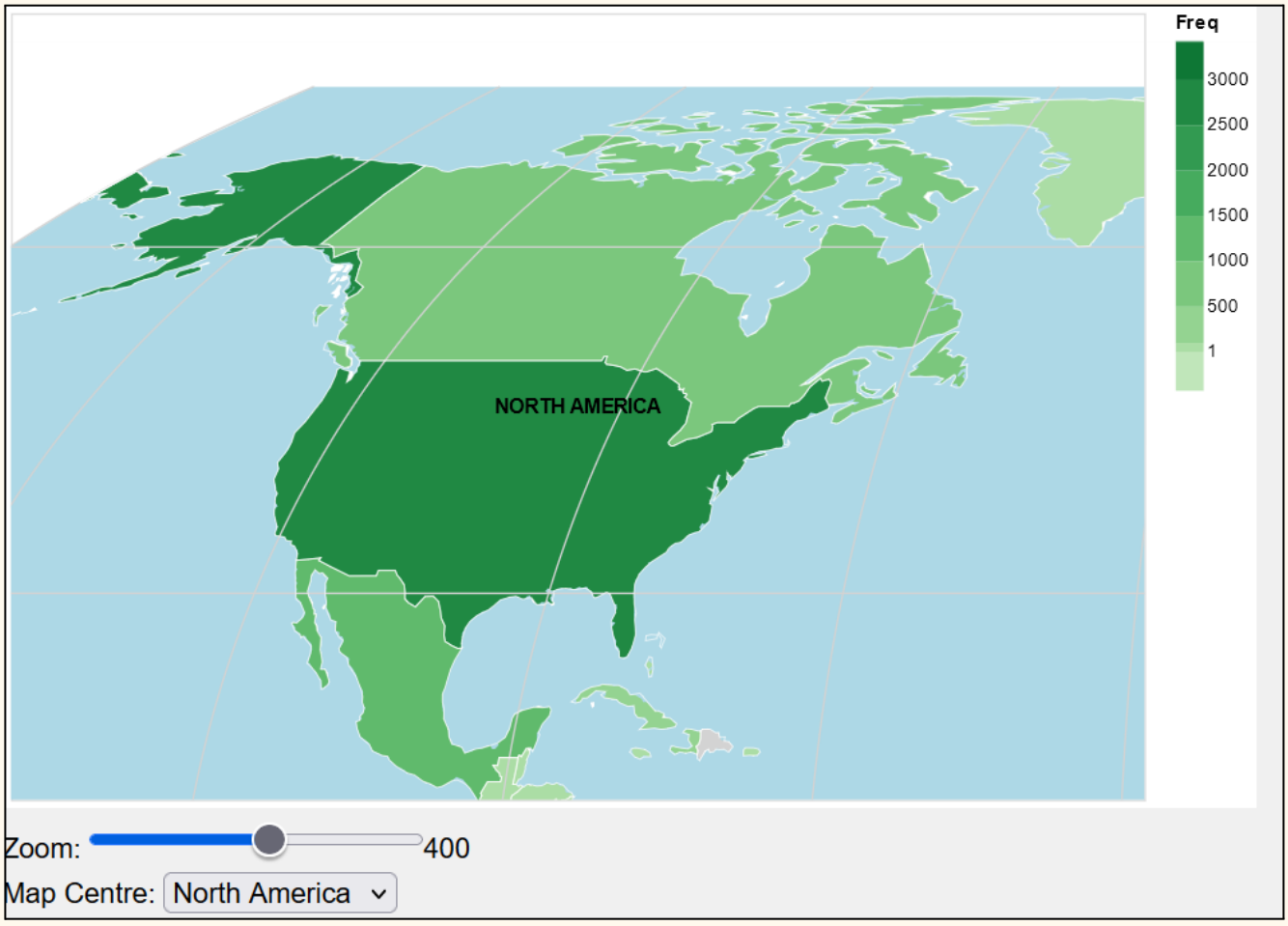

Figure 1.4: Feature 4: Map center interactivity

This visualization in Figure 1 allows users to have an overview of the global distribution of the artwork shown at the MoMA. The use of color saturation in marked geographical areas enables a straightforward comparison of the quantity of artworks produced by different countries. The interactive features, including zoom, map centering, and tooltips, enhance the user experience by providing the flexibility to explore specific regions in greater detail. This functionality proves invaluable for uncovering nuanced insights into geographic concentrations of artistic contributions within MoMA's collection, fostering a deeper understanding of the museum's global representation and curation trends.

Idiom 2: Bump Chart

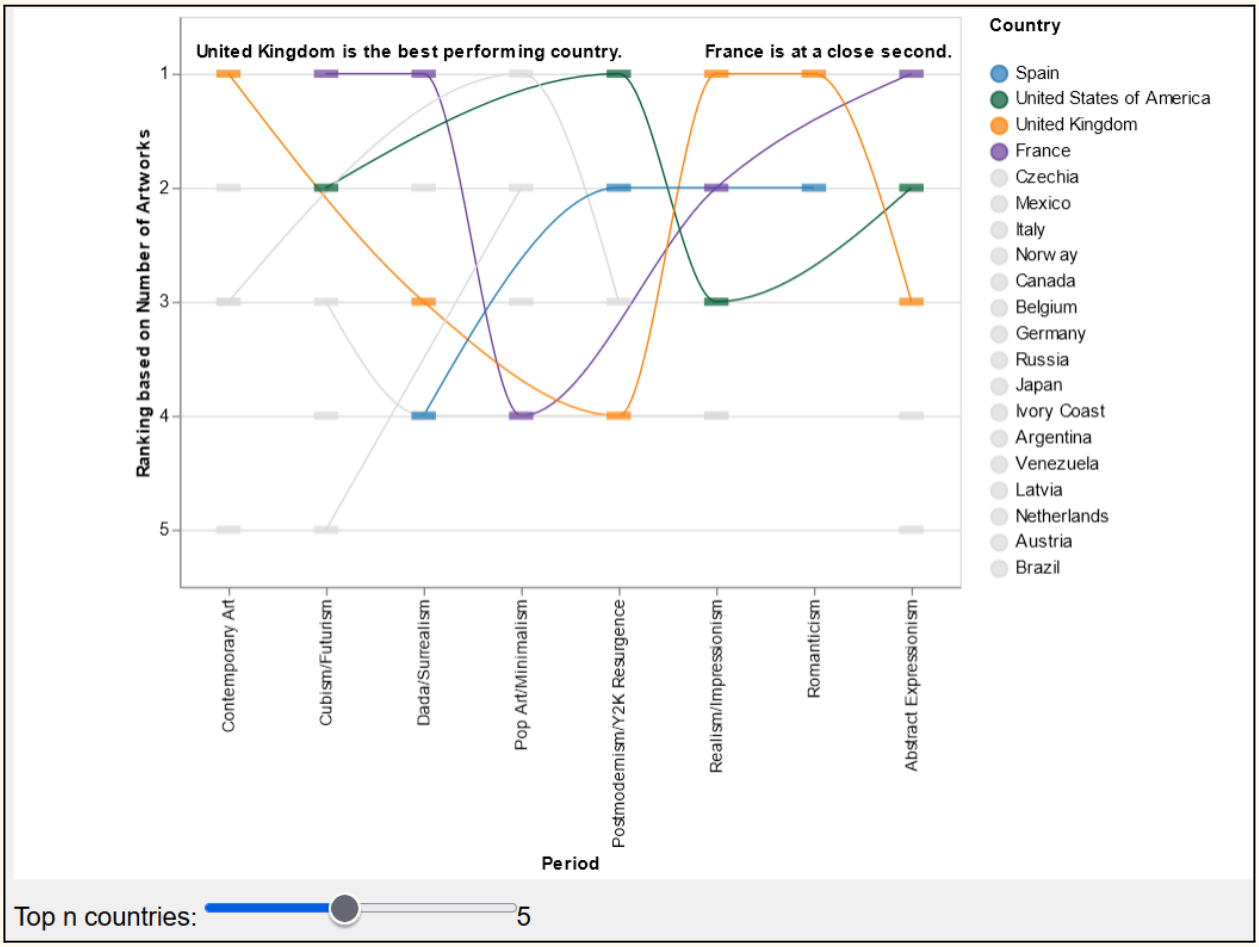

Figure 2: A bump chart showing the number of artworks divided over artistic periods per country

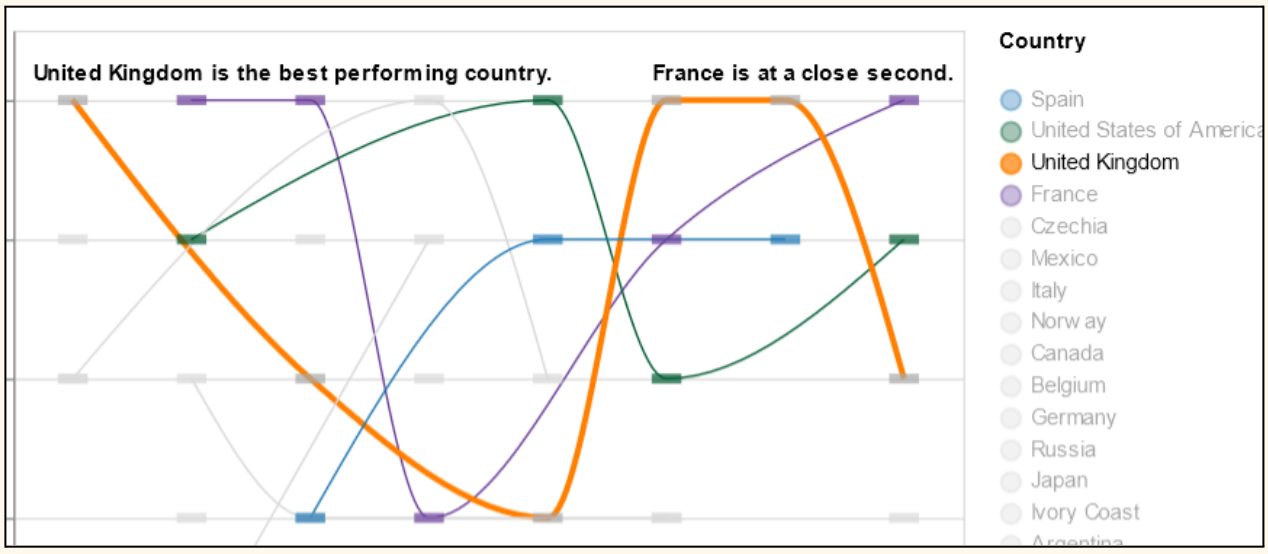

Figure 2.1: Feature 1: Clicking the line shows the trend by bolding the line.

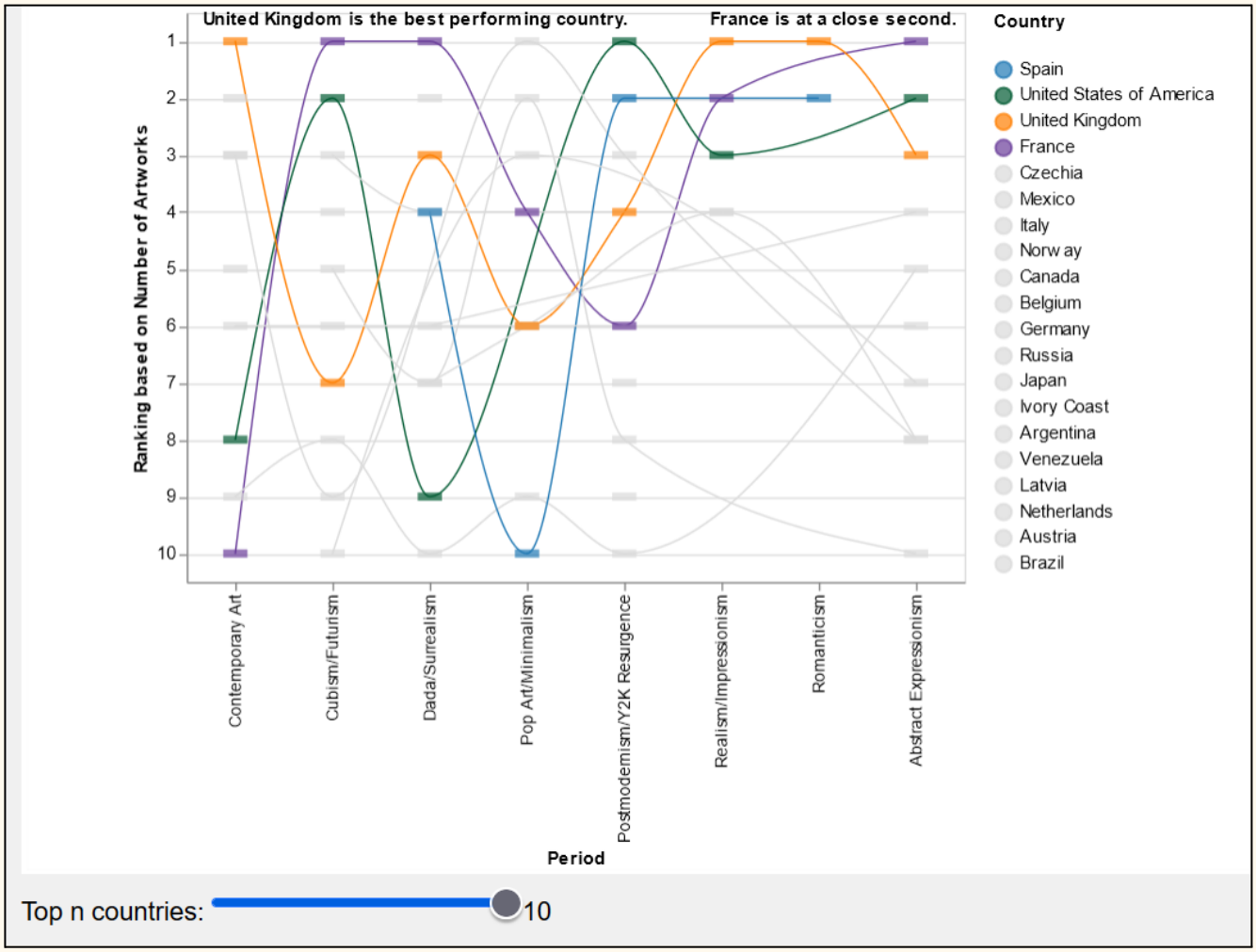

Figure 2.2: Feature 2: The slider shows the Top N Countries based on rank

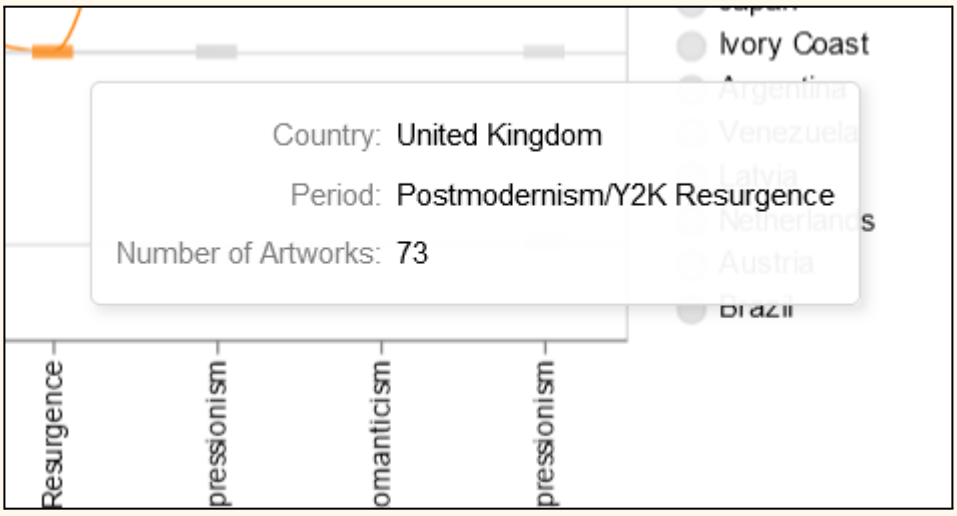

Figure 2.3: Feature 3: Tooltips show detailed information on the country during that period.

A bump chart effectively conveys the ranking of countries across different periods, emphasizing changes in their relative positions. The technique of clicking on the line to make it bolder serves to highlight specific periods, enabling clearer observation of the relationships between countries. Additionally, the strategic use of graying out lower-rated countries contributes to visual clarity. By desaturating less prominent contributors, the focus remains on the top-ranking countries, reducing potential visual clutter and enabling users to discern key insights into the evolving patterns of artistic contributions across different periods. The inclusion of a slider enhances the user's ability to dynamically explore the artistic contributions of countries over time by adjusting the displayed top N countries.

Idiom 3: Horizontal Bar Chart

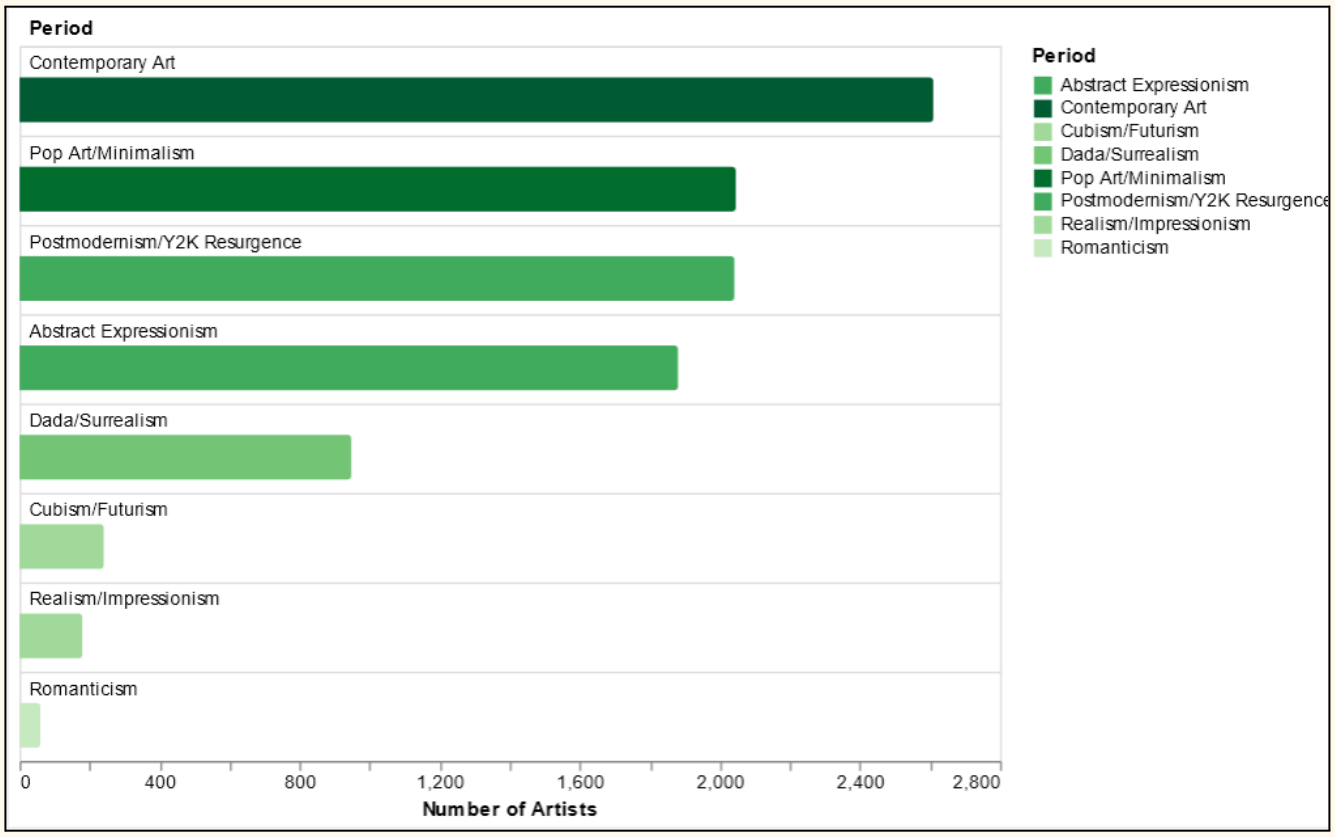

Figure 3: Horizontal Bar Chart with rounded edges and sorted in descending order

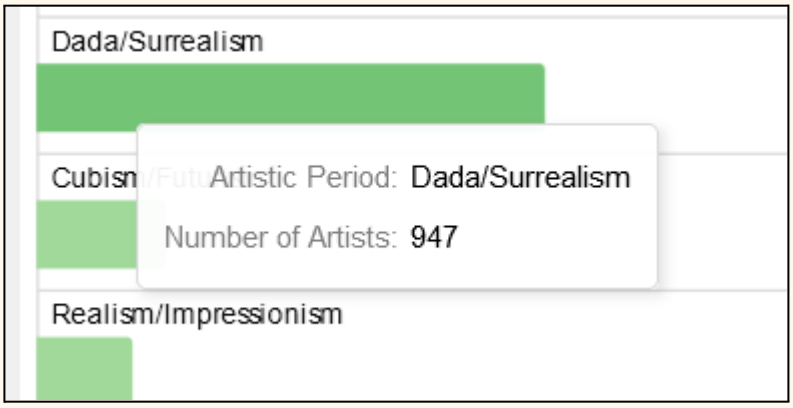

Figure 3.1: Feature 1: Tooltips

The use of a bar chart serves as an effective visual representation to showcase the distribution of artistic output over time. This chart type allows for a quick and intuitive comparison of the quantity of artworks across different periods, with the bars indicating the relative magnitude of artistic production. Sorting the bars in descending order places the art periods with the highest artwork production at the forefront, providing a clear hierarchy. This visual representation facilitates an immediate understanding of the periods that yielded the most significant artistic output, aiding users in gaining insights into MoMA's selection collection across various art periods.

Design

Layout

The decision to split the visualization into eight major sections, each delineated by a bold title is done to represent a section per insight.

Figure 4: Example of title separating the sections

This approach facilitates a clear and structured presentation, guiding the viewer through distinct segments of information. By utilizing the pure.css library for layout creation, ensuring a seamless and user-friendly experience across different devices and screen sizes. Furthermore, the use of this library helps in efficiently managing white space, striking a balance that enhances the overall symmetry of the visualization. This design contributes to an engaging and cohesive user experience, ensuring that the viewer can navigate through the content seamlessly while maintaining an aesthetically pleasing and well-organized presentation.

Colour

Firstly, the use of a green palette promotes color consistency throughout the visual elements, contributing to a unified and harmonious design. Furthermore, the color scheme is thoughtfully designed to be color-blind-friendly. Darker shades within the green spectrum are employed to signify higher values in the bar chart, scatter plot, and choropleth map, while lighter hues indicate lower values.

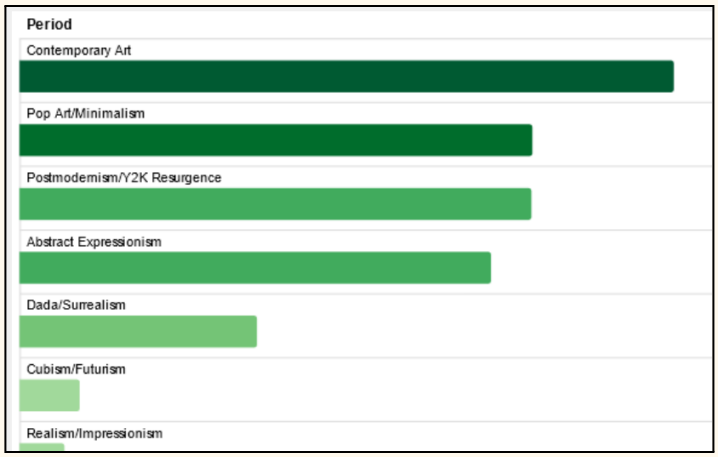

Figure 5.1: Using color to show higher values in a chart

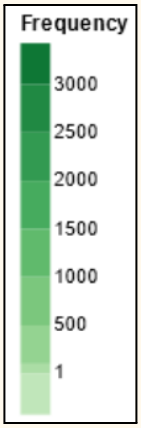

Figure 5.2: Another example of using color to show darker values have a higher value and vice versa.

Additionally, for charts requiring more nuanced encoding beyond categorical distinctions, such as the bump chart, a selective use of other colors is implemented, providing a visual hierarchy for conveying insights.

Figure Ground

A strategic use of desaturated colors, particularly gray, was employed to represent less critical data in the bump chart. This deliberate choice serves the purpose of visually distinguishing less important elements from the core content, ensuring that the focus remains on the most pertinent information.

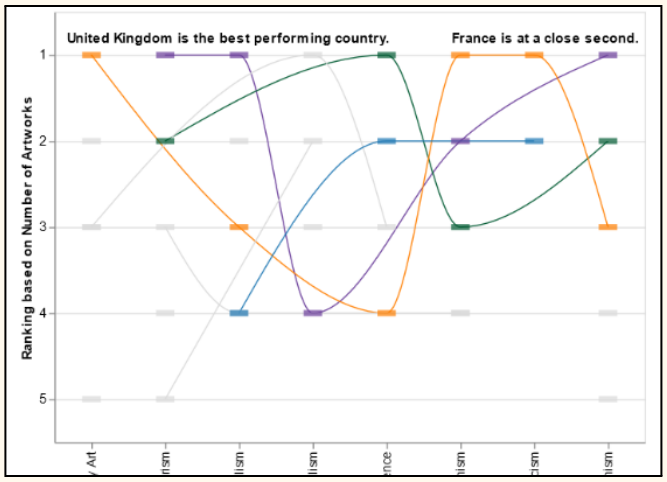

Figure 6.1: Example showing the unimportant elements (countries) being grayed out.

Figure 6.2: Example showing unimportant elements (country name) being in gray font

Titles, presented in bold and larger font, draw immediate attention and guide users through the visual narrative, providing a clear structure.

Furthermore, the decision to bold important words within the description paragraph enhances readability and aids in quickly identifying key insights. By avoiding excessive color encoding for less essential data, the design minimizes potential confusion, allowing users to navigate the visualization with ease and concentrate on the highlighted keywords.

Here, the visualization highlights that among the top countries contributing significantly to MoMA's collection are the **United States, Spain, and Russia** . This underscores the global nature of MoMA's acquisitions, showcasing a mainly **more western** but diverse range of artistic expressions and cultural influences from these nations.

Figure 6.3: Example of important words being bolded.

Typography

The choice of Franklin Gothic Demi for the header and chart title is intentional, aligning with MoMA's established brand representation. This font not only maintains consistency with MoMA's visual identity but also conveys a sense of boldness and prominence suitable for headers. Lato is selected for the description paragraph and chart annotation due to its readability and clean, modern appearance, ensuring clarity in conveying information. Both typefaces offer excellent readability without the distraction of serifs, making them well-suited for digital formats. In an effort to emphasize keywords within the description, bolding is employed instead of color encoding. This decision aims to maintain visual simplicity and avoid potential confusion that could arise from excessive use of different colors throughout the visualization, preserving the overall coherence and effectiveness of the design.

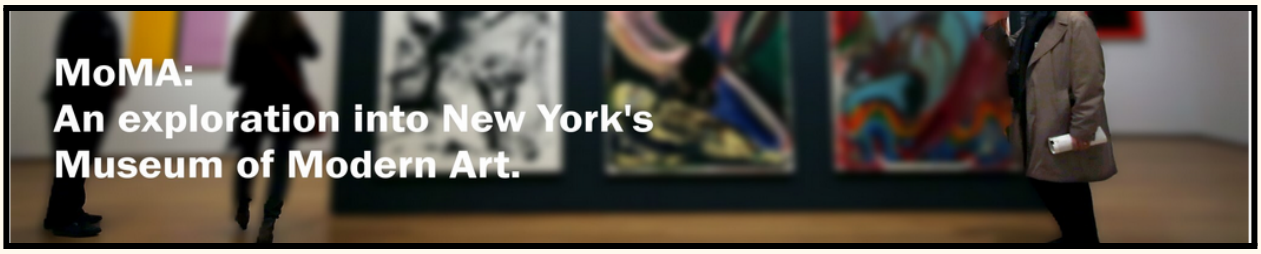

Figure 7.1: Header of the dashboard showing utilization of the Franklin Gothic Demi font

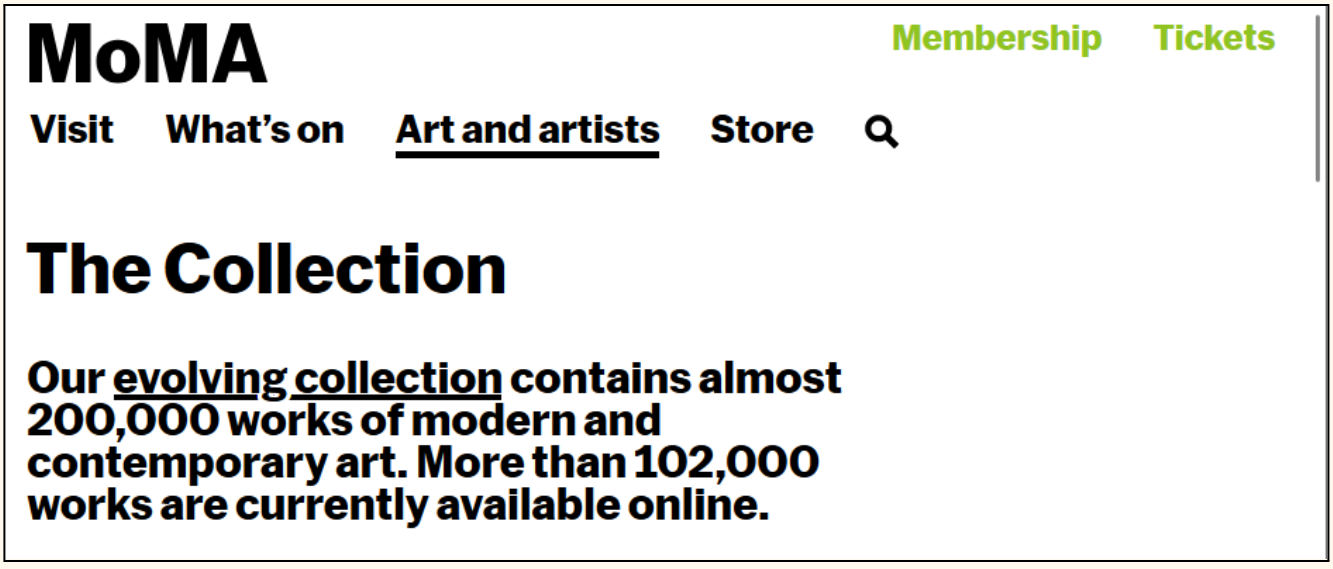

Figure 7.2: Header of the MoMA website to show as a comparison

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Storytelling

The flow of the charts in the dashboard is clearly indicated by the titles and the sectioning of the charts. In addition, a html navigation bar is added for the ease of navigation for users as shown below.

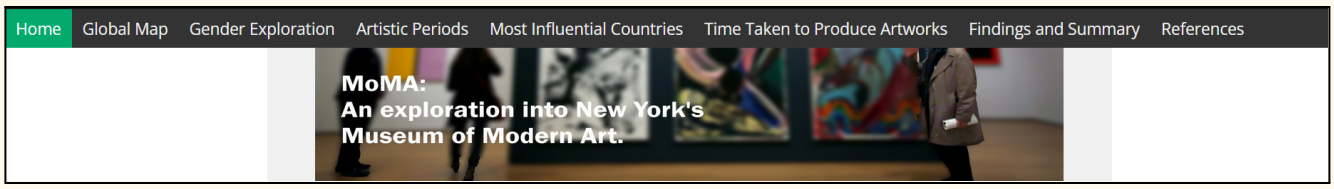

Figure 8.1: Header and navigation bar

This visualization is arranged from top to bottom and charts are embedded side-by-side in each section. A top to bottom, left to right view is implied by the arrangement of the graphs. The sections also intuitively guide the viewer to the general information, before moving on to the complex information.

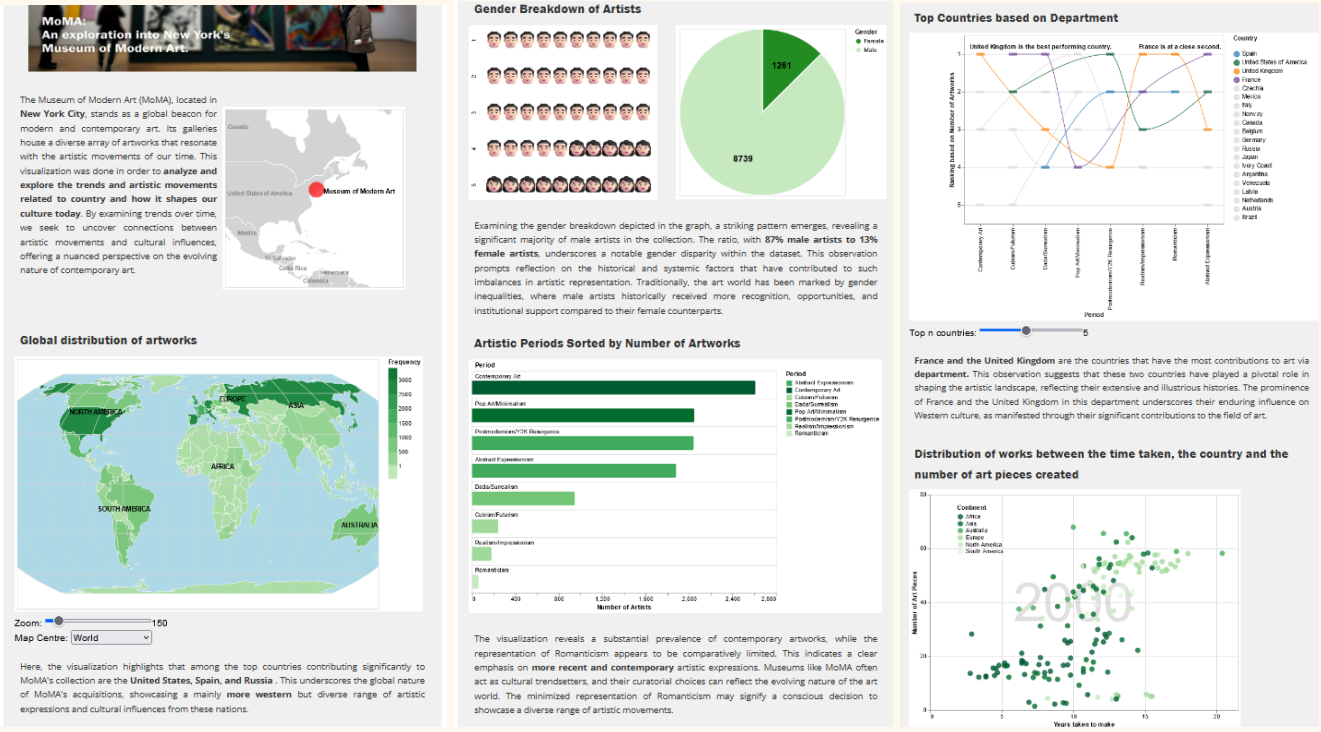

Figure 8.2: A general overview of the layout of the dashboard

References

Heer, J. (n.d.). *Vega-Lite Population Pyramids / Vega*. Observable. Retrieved October 11, 2023, from https://observablehq.com/@vega/vega-lite-population-pyramids

jwoLondon. (n.d.). *Isotype Dot Plot with Emoji*. Vega-Lite. Retrieved October 11, 2023, from https://vega.github.io/vega-lite/examples/isotype_bar_chart_emoji.html

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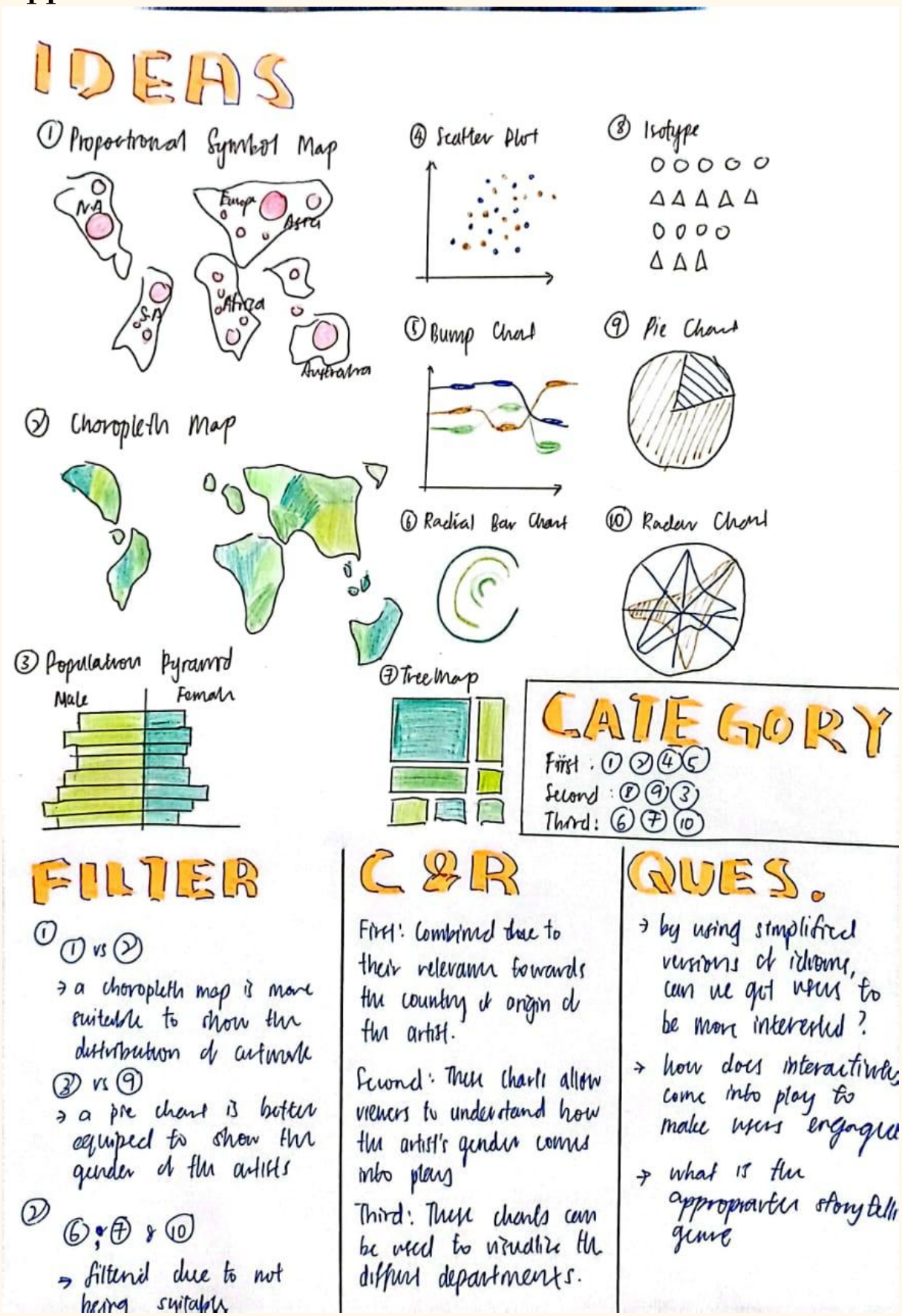
Roeder, O. (2015, August 28). A Nerd's Guide To The 2,229 Paintings At MoMA. *FiveThirtyEight*. https://fivethirtyeight.com/features/a-nerds-guide-to-the-2229-paintings-at-moma/

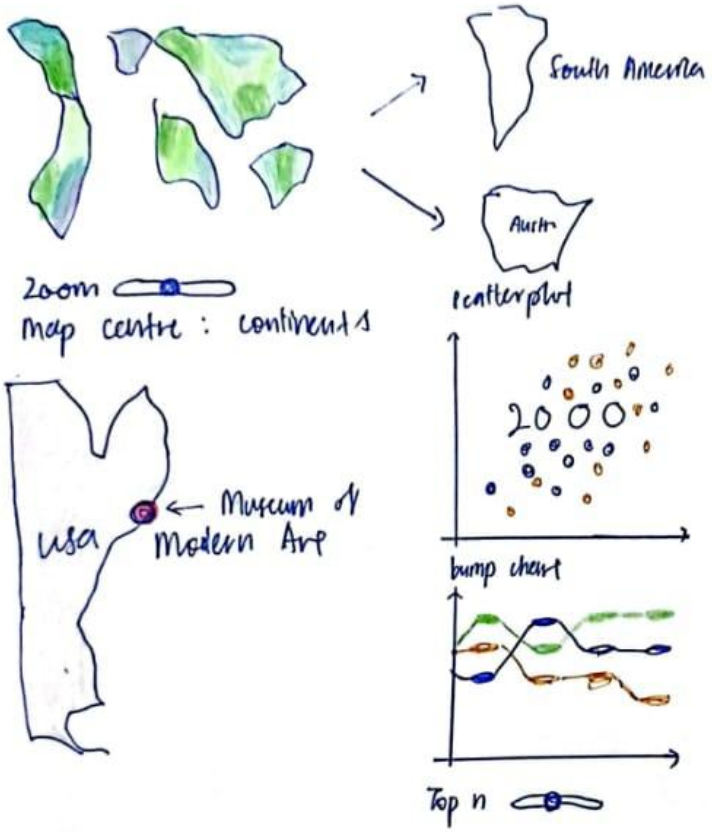
Romeo, F. (2015, October 27). Here's a roundup of how people have used MoMA's data so far. *Medium*. https://medium.com/@foe/here-s-a-roundup-of-how-people-have-used-our-data-so-far-80862e4ce220

The Museum of Modern Art (MoMA) Collection. (2023). [Computer software]. MoMA. https://github.com/MuseumofModernArt/collection (Original work published 2015)

Appendix


IDEAS
① Proportional Symbol Map
NA
Europe
Asia
Africa
SA
Australia
② Choropleth Map
③ Population Pyramid
Male
Female
④ Scatter Plot
⑤ Bump Chart
⑥ Radial Bar Chart
⑦ Tree Map
⑧ Isotype
⑨ Pie Chart
⑩ Radar Chart
CATEGORY
First : ① ② ④ ⑤
Second : ⑧ ⑨ ③
Third : ⑥ ⑦ ⑩
FILTER
① ① vs ②
→ a choropleth map is more suitable to show the distribution of artwork
③ vs ⑨
→ a pie chart is better equipped to show the gender of the artists
② ⑥ ⑦ & ⑩
→ filtered due to not being suitable
C & R
First: Combined due to their relevance towards the country of origin of the artist.
Second: These charts allow viewers to understand how the artist's gender comes into play
Third: These charts can be used to visualize the different departments.
QUES.
→ by using simplified versions of iconic, can we get users to be more interested?
→ how does interactivity come into play to make users engaged
→ what is the appropriate storytelling genre

LAYOUT



INFO

Title: Da FIT3179 Data Vis. Project 2
Author: Hon Chia Chieng
Date: 20/09/2023
Sheet No: 2

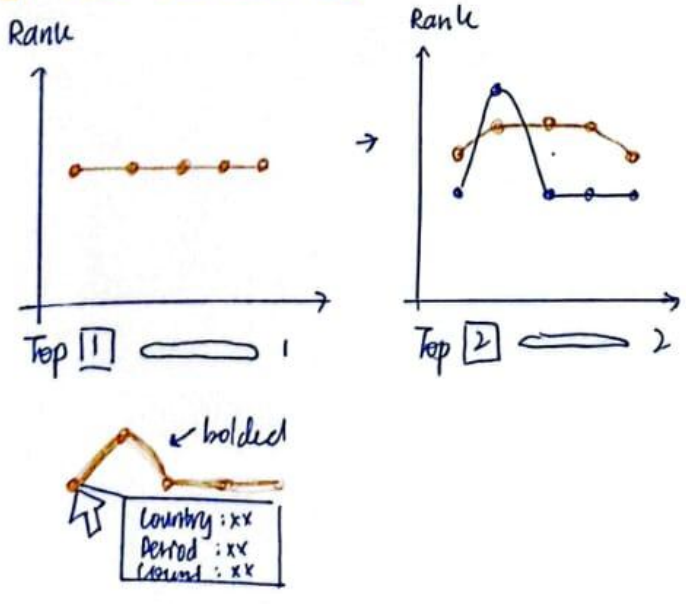
OPERATION

① Hovering over the charts will show more detailed information about the data encoded. This is because the way we encode the data may not show the actual values clearly.

② A selection menu is provided to give the users more choice

③ The users can ~~fate~~ fit filter the values based on a range using a slider.

FOCUS



DISCUSS +

① Visualizations are simple & direct which allows viewers to understand the information conveyed quickly

② Interactivity is added to reduce cognitive load & increase user engagement.

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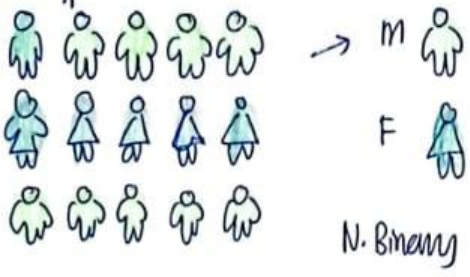
① multiple map plots may seem redundant

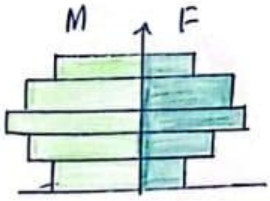
② it may be hard to see relevance of scatter plot

③ complexity of the bump chart & scatterplot may deter viewers

LAYOUT

isotype





INFO

Title: FIT3179 Data Vis. Project 2
Author: Koh Chia Chings
Date: 20/09/2023
Sheet No: 3

OPERATIONS

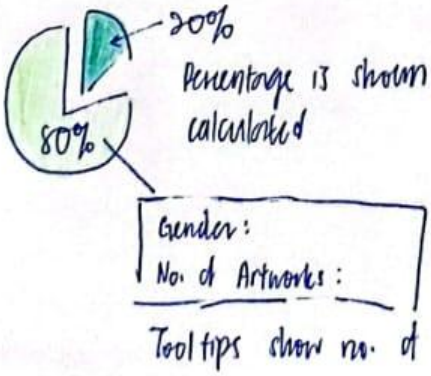
① Hovering over the charts will show tooltips which would give the users more information

② Different but distinct shades of green will be used to separate the colours for the 2 genders

FOCUS

 ← use emoji to represent genders = distinct icons

↳ scaled to 50 emojis as to allow for a clean & concise visualization



Tooltips show no. of artworks

DISCUSS +

① The visualizations chosen are simple & intuitive and are very effective in showing general ~~age~~ quantities

② The isotype chart is engaging & memoral because of it's pictoral nature

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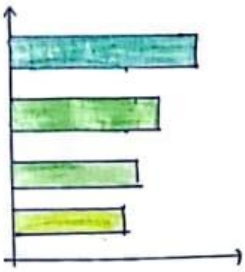
① The charts may struggle to represent complex relationship.

② Not suitable for larger datasets as charts can get messy if not scaled.

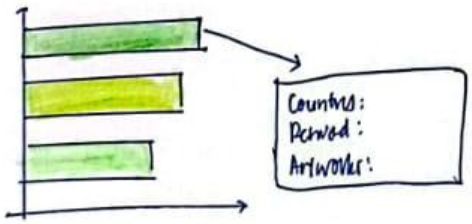
LAYOUT

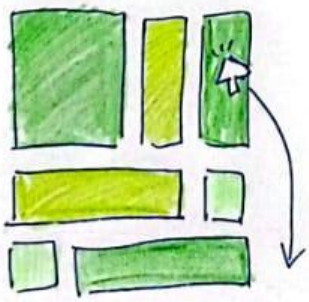
or



or

FOCUS





Clicking on a grid on the treemap will highlight that specific category & ~~dest~~ desaturate the rest.

INFO

Title: FIT3179 Data Vis. Project 2
Author: Goh Chia Ching
Date: 20/09/2023
Sheet No: 4

OPERATION

① Hovering over the charts will show the tooltips and deselect the other portions of the chart (done by desaturation)

② Clicking will ~~##~~ also trigger the desaturation figure ground effect.

③ Additional filtering with a slider or a selection menu can be done.

DISCUSS +

① users can retrieve a lot of data relating to different categories such as → time / period
→ department of artwork
→ medium of artwork

—

① Dashboard may be too colourful which causes colour inconsistency

② Visualizations are rather complex

③ The ~~that~~ visualizations can cause the balance & placement of the dashboard to be skewed.

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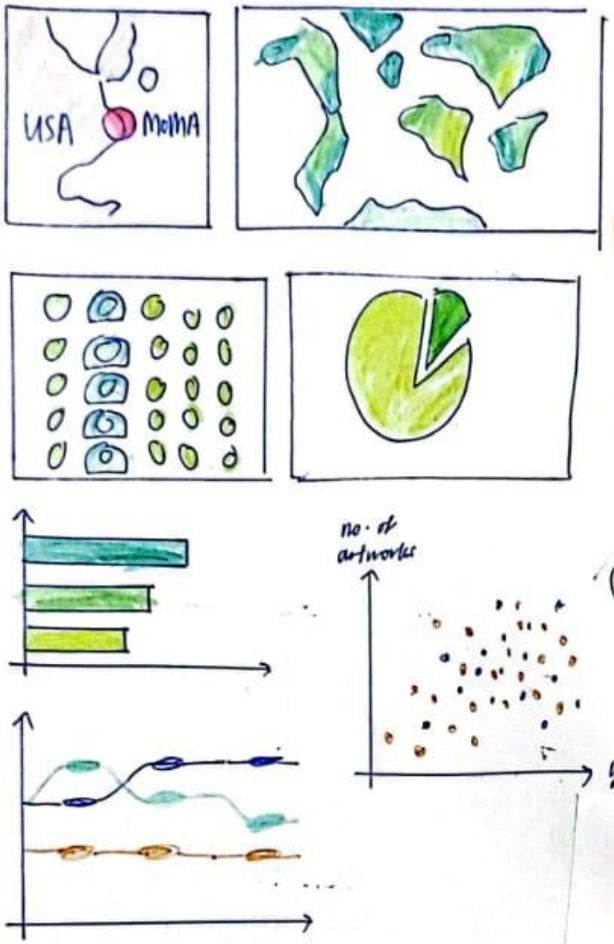
LAYOUT



INFO

Title: FIT3179 Data Vis. Aqeut 2
Author: Goh Chia Cheng
Date: 20/09/2023
Sheet No.: 5

OPERATIONS

① Tooltips will be shown upon hovering over the chart

② Most charts other than the bump chart will be encoded using a scale of greens.

③ Storytelling: The charts are arranged as to allow users to view each section clearly, the first section would be about general statistics, the next about the art period & so on.

DETAILS

~~The dataset was obtained from the~~ Museum of Modern Art's Github and cleaned. It contains more than 30,000 artworks which ~~was~~ 10,000 of them were sampled for this visualization

FOCUS

① Filtering w/ Slider
- → the slider can be used to observe changes in the data or change the perspective of the viewer
- → used in: scatter plot, choropleth, bump.

② Filtering using a dropdown menu
- → user can choose a specific option from the selection menu to observe that specific data to get more details
- → used in: choropleth map

③ Tooltip
- → Tooltips are added to all charts to show the users more details on the data encoded

DEPENDECIES

D3

ESTIMATES

→ cost: None

→ 13/09/2023 → dataset selection

→ 20/09/2023 → ideation & layout

→ 30/09/2023 → design & finalization