Process book link:

https://docs.google.com/document/d/1Nc-s3pmTH_fYSqyIkswTZ5gJWmMXv8CJ3DmgMF4S1FY/edit?usp=sharing

Shared drive:

https://drive.google.com/drive/folders/1MJl_dGZzMjdQ8cgOGOF1Ux_uf4F5FFHa?usp=sharing

Members:

All members have contributed significantly to the development of the detailed project plan and were in attendance at our first meeting outside of class.

Group Member 1 Name: Sidney Beaumaster
Group Member 1 Email: sbeaumaster@hbs.edu

Group Member 2 Name: Tobias Haefele
Group Member 2 Email: toh833@harvard.edu

Group Member 3 Name: Jovin Leong
Group Member 3 Email: jovinwleong@gmail.com

Group Member 4 Name: Michael Huang
Group Member 4 Email: huangm@college.harvard.edu

Project Proposal

Project Title: ***Borderline: A look into border barriers and the people they keep apart***

Motivation: General interest in government and how patterns and variations in economic inequality and quality of life can be visualised both across countries and across subnational regions and municipalities within countries.

Datasets: Primarily, we will utilise a dataset on the economic and social landscape of Germany available from inkar.de (already acquired); we might potentially work with additional datasets from the US and/or other countries along with micro-data on specific cities etc.

Goal: In our project, we want to understand how borders impact the quality of life of individuals and explore how they potentially generate regional inequalities. In particular, we examine the case of Germany (and perhaps draw contrasts with the US/other countries) based on a number of socioeconomic indicators.

Team culture

a) How will we communicate

- Chiefly, we will communicate informally through Whatsapp for the bulk of our online discussions
- We will also use commenting on the various platforms (Google Docs and Github) in order to communicate specific points pertaining to our contributions
- A large part of our planning and coordination will involve in-person communication and meetings and during allocated meeting times at classes

b) How and when will we meet

- We will meet semi-regularly as and when appropriate; we will meet more towards the beginning of our project in order to ensure that the scoping and tasks are adequately coordinated and agreed upon.
- We plan to meet weekly towards the end of the working week (Thursdays, Fridays, Saturdays); in the event that this is not possible or feasible, we endeavour to meet online via Zoom or some equivalent.
- Our key meeting areas will be the collaborative spaces in:
  - The Northwestern Building basement
  - The Maxwell-Dworkin building's open spaces

c) How we will collaborate on implementation

- For brainstorming, administrative work, and developing documents or written work, we will mostly use Google Docs for collaborative writing.
- We will use Dropbox to store and transfer larger assets if applicable
- For our code, we will use Github to ensure version control and maintain a professional directory structure

d) Team roles

- Data wrangler: Tobias
- Taskmaster: Sidney
- Version control and consistency: Jovin
- Tester/debugger: Michael

Team expectations

- All members are to prepare for meetings; come with a 2-minute summary of what you've done in between the last meeting and now
- All members are to look through code whenever tasked to
- All members must highlight any uncertainty or anything they are unclear about
- All members should ensure that meetings and discussions are a safe space and we will not tolerate any form of abuse
- All members should treat each other respectfully and ensure criticism provided is of a constructive nature

Project plan:

Map

- Audience
    - The general public
    - Those with an interest in politics, socioeconomic change, and advocacy
    - Political think tanks and policymakers
- Specific goals: Work as a team to effectively and objectively visualize and illustrate the facts concerning borders and how they impact communities through a compelling narrative surrounding our German case study. Raise awareness on the subject and reduce any misconceptions that might be generated from summary statistics or broader narratives in the media
- Questions we hope to address
    - How is the incidence of interstate or inter-region borders changing over time?
        - Where are these borders?
    - What are the impacts of these divisions?
        - What are the short-term and/or long-term consequences?
        - How significant are these impacts?
        - How do they relate to individuals?
    - How do these impacts and consequences come about?
        - Can they be mitigated?
    - What present-day socioeconomic circumstances result from the lingering aftereffects of borders and man-made divisions?
- Objectives:
    - Create a website that conveys objective facts concerning borders and their consequences through a compelling narrative
        - Take on a historical approach by visualizing changes in border incidence
        - Provide a detailed case study of the German case with the Berlin wall - how the border arose and what impacts it brought about
        - Examine the lasting consequences of the Berlin wall in Germany and explore regional inequalities and differences across Germany
        - Relate the experience to present-day and future borders; articulate how they might potentially affect current and future generations

    - What's missing:
        - Our visualization deals with a politically thorny issue that is very much enmeshed with historical, cultural, and social differences that we cannot feasibly and adequately address in our page. As such, our visualization does not take a stand as to what would constitute an ideal outcome concerning borders.
        - In the same vein, our visualization does not advocate any particular position nor inform individuals how they can go about changing the status quo - our visualization is more concerned with providing as objective and accurate a picture as we can concerning the subject.
        - Our visualization does not exhaustively detail all borders nor make the claim that the German experience maps perfectly across contexts.

Plan

- Basic information
    - Our website details some history behind borders and examines the German Berlin wall in detail through effective visualizations; we subsequently relate our results and findings to present-day and proposed borders in order to provide our audience a stronger, more visual understanding of borders.
- Background and motivation
    - Borders are a particularly contentious issue in mainstream media presently; interstate and inter-region boundaries have been very much politicized in places such as the US, Austria, and Ireland.
    - We hope to provide individuals with a more informed position concerning borders in order to enable them to make more conscious political decisions and better understand how the creation or destruction of these man-made divides might impact them
- Related work
    - From 7 to 77: There's been an explosion in building border walls since WW II
    - This American Life, Walls

Definition of goals and tasks

Our goal is to develop an informative website that will enable viewers to gain a fuller and more empirically grounded understanding of border barriers and the consequences these borders have on communities and individuals. In light of the recent politicization of borders, our team feels that this is an issue that is more pertinent than ever—it is, therefore, of utmost importance that individuals have a more complete understanding of the impacts, consequences, and history surrounding border barriers in order for them to make more informed and purposeful political decisions.

Our website hopes to convey a stirring narrative that charts the incidence of border barriers since WWII and provide insight on the consequences of such barriers through an in-depth examination of the German experience with the Berlin Wall and how its aftershocks continue to ripple throughout Germany 30 years after its fall. We then prompt viewers to consider several existing, proposed, and historical border barriers that have been particularly significant; we encourage viewers to explore the various cases and understand how their own communities might be affected.

Viewers should be able to use the visualizations to explore how different regions in Germany face starkly contrasting socioeconomic circumstances; they should be able to select which variables and metrics they would like to consider and come to their own conclusions concerning the impact of the Berlin wall on present-day Germany. They should also have the option to go into greater detail about each region in Germany and learn about other significant cases of border barriers.

Our aim is that viewers will leave with an objective understanding of border barriers and their consequences through a visually-driven narrative; Users should be able to simply scroll through our website and follow the narrative thread while interacting with several of our visualizations in order to gain a deeper understanding of the subject at hand. The website should be accessible, intuitive, and hassle-free; the content of our site should be succinct, to the point, and not at all preachy. Our website remains firmly apolitical and urges viewers to arrive at their own conclusions and opinions concerning said borders.

Our tasks are to clean and sort the dataset that we have obtained and select the best and most interesting variables for use in a data-rich and vibrant visualization for our German case-study. Meanwhile, we will also need to piece together the data we have obtained concerning border barrier incidence and encode this information into an intuitive and engaging interactive visualization; we will also need to relate this data to several maps. Additionally, we will need to write a concise and informative exposition to accompany our visualizations and contextualize the situations. We will finally need to explore how we can give our visualizations a more dynamic and vibrant aesthetic so as to relate the issue of borders to more personal and human outcomes while maintaining objectivity.

Data description

- Our main dataset for our most data-intensive portion (the German case study) has been acquired from *Inkar*[1]. It contains over 150 socioeconomic variables from various administrative regional units (most granular on Germany's 402 "Kreise" (i.e.local government/ councils in Germany).
    - Variables include GDP per capita, unemployment rates, distances to hospitals, pharmacies, primary schools and airport, household earnings as well as demographic information such as age groups.
- The data is available as a .csv file and as the original dataset is in German, Tobias has translated the variable names into English for the team to understand.
- Data on borders will be obtained through the *GADM* database[2]; contains additional topographical and geographical data as well if necessary. We also will use the World Borders Dataset from *Thematic Mapping*[3] to complement our data if it is more workable.
- We also use the novel dataset presented by Hassner and Wittenberg[4] (available on Hollis) for summary statistics and information concerning the development and incidence of border barriers since WWII.

[1] https://www.inkar.de/
[2] https://gadm.org/data.html
[3] http://thematicmapping.org/downloads/world_borders.php
[4] Ron E. Hassner and Jason Wittenberg, Barriers to Entry: Who Builds Fortified Boundaries and Why?, International Security Volume 40 | Issue 1 | Summer 2015 p.157-190. https://www-mitpressjournals-org.ezp-prod1.hul.harvard.edu/doi/10.1162/ISEC_a_00206

Project timeline

- w/c 4th November (week 0): Setup, planning, data acquisition
    - Align detailed, final project plan, make sketches and agree overall storyline as well as team norms, milestones, and skeleton of visualizations
    - Initialize collaborative platforms and set up main directory structure and templates

- w/c 11th November (week 1): Create JS mockup and flesh out core visualizations
    - Begin work on core visualizations and website design
        - Choropleth map for Germany with interactive functions
            - Filter options included
            - Tooltips and additional information
        - Area chart for summary statistics on borders
    - Understand feasibility of “nice to haves”; adjust plan accordingly

- w/c 18th November (week 2): Build out full first prototype of core visualizations
    - Develop and put together working prototype of core visualizations
    - Include mockup for additional visualization

- w/c 25th November (week 3): Gather feedback and review
    - Gather feedback and tailor visualizations accordingly; perform simple usability testing and think-aloud tests
    - Flesh out existing visualizations

- w/c 2nd December (week 4):Implement feedback
    - Implement details and more advanced interactive features
    - Ensure visualization meets accessibility standards and reflects or at least addresses the feedback from the tests

- w/c 9th December (week 5): Add “detail” and final touch (tool tips, colours, formatting, etc.)
    - Touch up and finalize designs
    - Host designs on Github pages and submit

Feature list

- Section 1: Background and introduction
    - Must have
        - Exposition on the significance of the issue and our title
        - Simple visualizations that illustrate the change over time
        - More exposition and text to explain the implication and the causes of the changes
    - Good to have:
        - More than one visualization to illustrate this change
        - Adjustable timeline to control set the start and end year for our timeline and our visualizations; horizontal axes will adjust and scale accordingly
    - Optional project extensions
        - Have the timeline run automatically like a gif or a video but still be interactive
        - Some visualization to encode the categorical data behind why the borders and barriers are established
- Section 2: Case study Germany
    - Must have:
        - Detailed and interactive choropleth map
        - An East-West comparison visualization; potentially the flower/radial charts sketched out below
        - A brushable visualization to illustrate how these East/West differences change over time
        - Discussion of the consequences; accompanying interpretations of data
    - Good to have:
        - Interactive and force-directed scatter visualizations to illustrate differences in quantity for several key socioeconomic variables
        - Age pyramids or some similar visualizations to express the granularity of impacts
    - Optional extensions:
        - Line chart over time
        - Elements and/or textures that mimic the graffiti on the Berlin wall

- Section 3: Outlook
    - Must have:
        - Visualization to illustrate the different existing border barriers across the world; can come in the form of a map or multiple small maps
        - Text to describe the situation and provide a summary and conclusion
        - Stress the apolitical nature of our project

    - Optional features:
        - Progress bar of a graffiti wall that becomes coloured in as the user moves through the visualization
        - Ensure the website is mobile-ready
        - Background texture of walls/borders that geographically separates out our space and “creates” individual elements

Team roles

All team members are expected to contribute significantly and work together as equals; the scope of tasks will not always be consistent but we each will take charge of the following few key organizational roles.

Tobias: Data wrangler

- Take charge of ensuring the data is clean, processed and relevant to our needs
- Will also ensure that citations and credits are accurate and updated and that the data is ethically sourced

Sidney: Taskmaster

- Will ensure that all members are assigned a fair and practical workload; will consider the past contributions of members
- Will take charge of ensuring that deadlines are adequately met and that assigned tasks are complete; in the case of extenuating circumstances, Sidney will help to facilitate a solution that accommodates the needs of all members and of the project.

Jovin: Version control and consistency

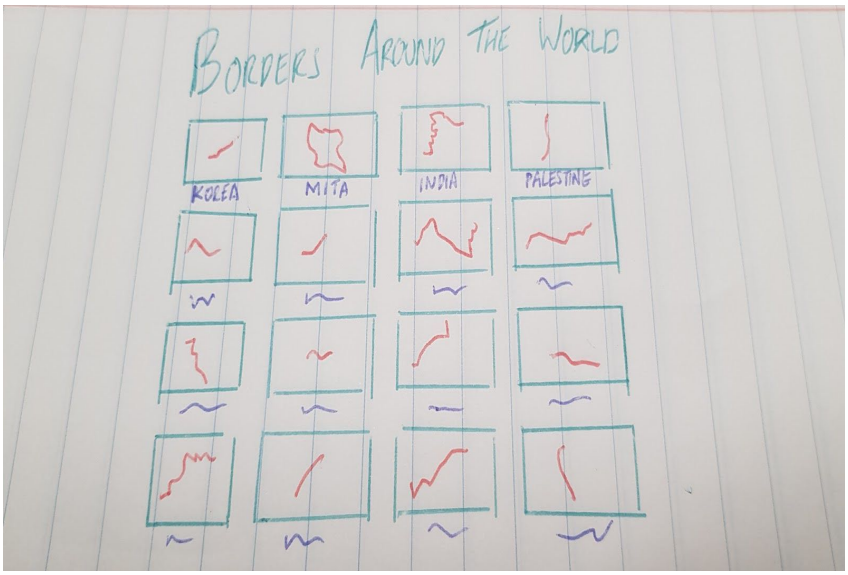
- Will make sure that everyone's code and work are up to date and that all contributions are properly merged and maintained.
- Will assist with knowledge management and documentation in order to ensure that code is understandable and that the style is consistent
- Will ensure that the code is functional across versions

Michael: Tester/debugger

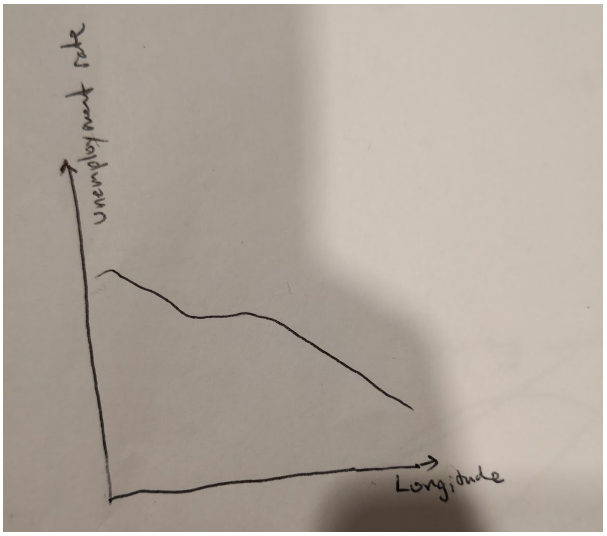
- Will take charge of all testing and post-test updates and implementation
- Will be on standby to assist the entire team whenever bugs or issues arise
- Will be in charge of doing up test cases in order to ensure that the visualizations and codes do not break

Visualization ideas (sketches)

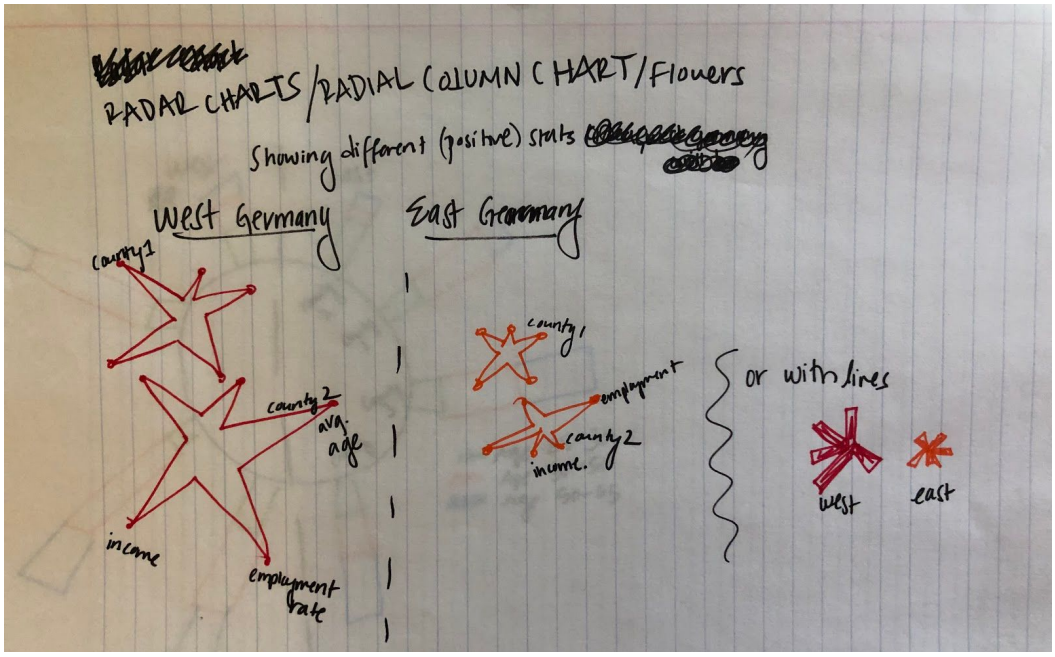
Several sketches of some of the visualizations we hope to implement



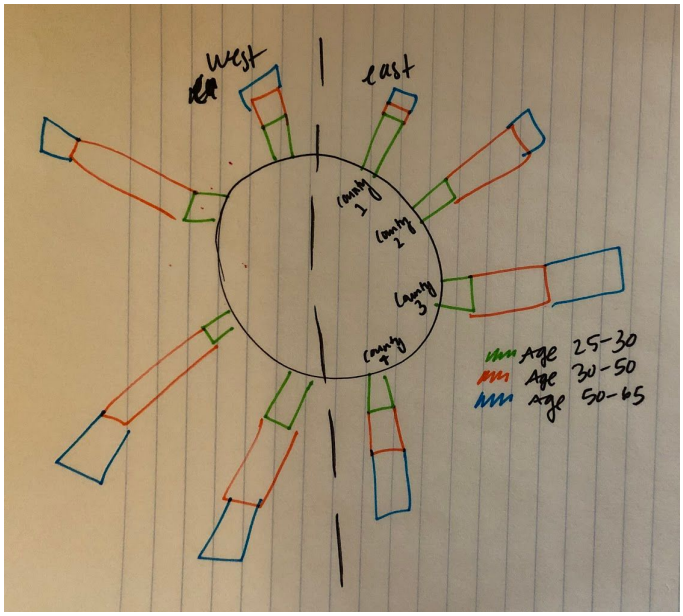
- Interactive minimalist visualizations that prompts users to hover over and explore the various borders; little context and just a striking red line



- Line charts measuring the various metrics and relating them to longitude to illustrate the significance of divide; similar to the climate change visualization in class perhaps

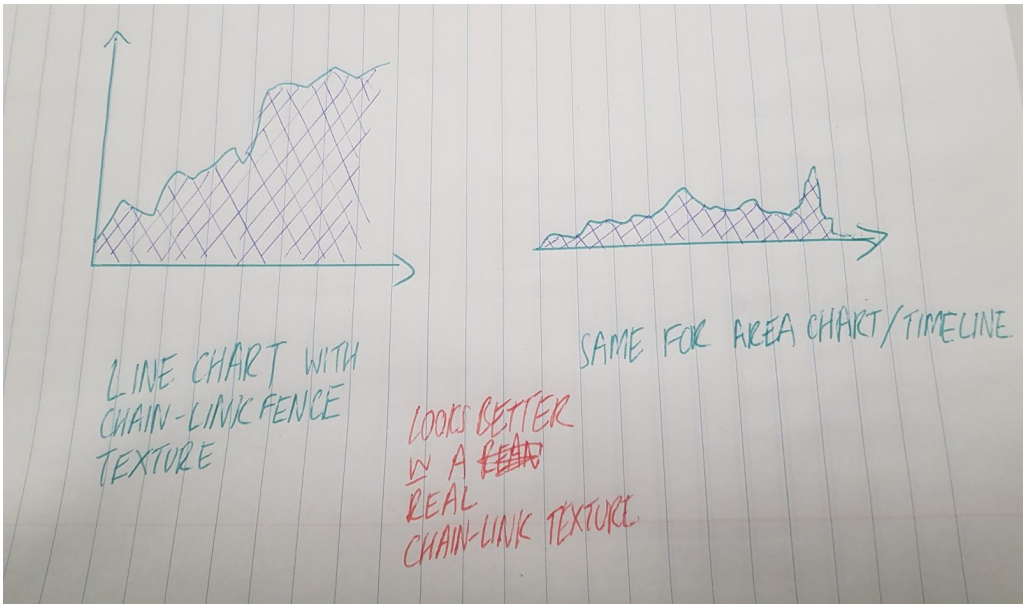


- A field of ‘flowers’ or radial charts for East and West Germany; shows how they differ using positive statistics. Each flower corresponds to a county



- Radial/Circular stacked bar chart breaking down unemployment by county; East/West denoted with different shades along with a literal East-West split
- Options to break down data by age, gender, etc

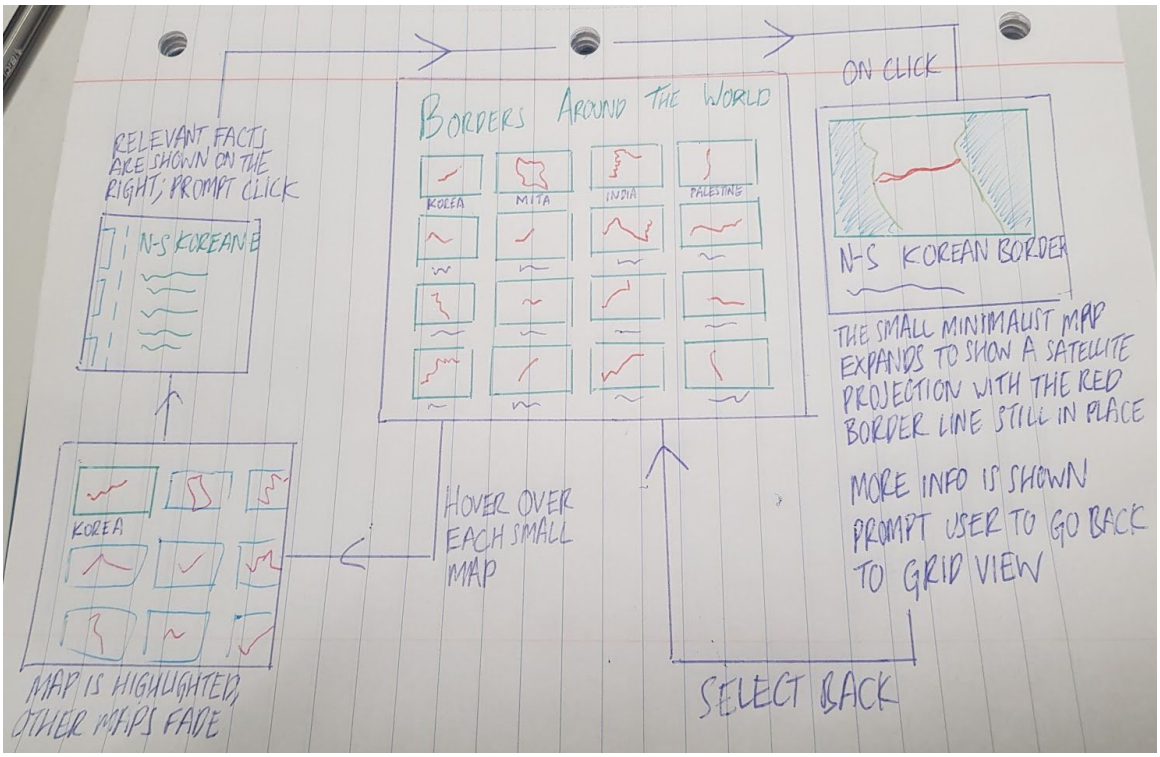
- Map showing key borders around the world; can include hover-over tooltips that provide information surrounding each border



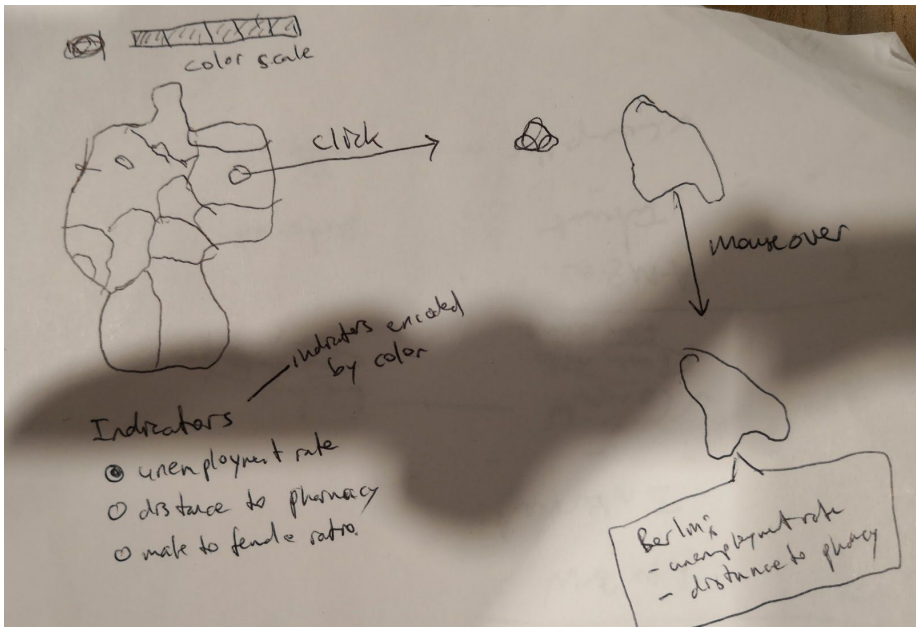
- Chain link texture for area charts in our timelines or line graphs
- Can also use the graffiti and aesthetic of the Berlin wall if its obvious

Interaction storyboards

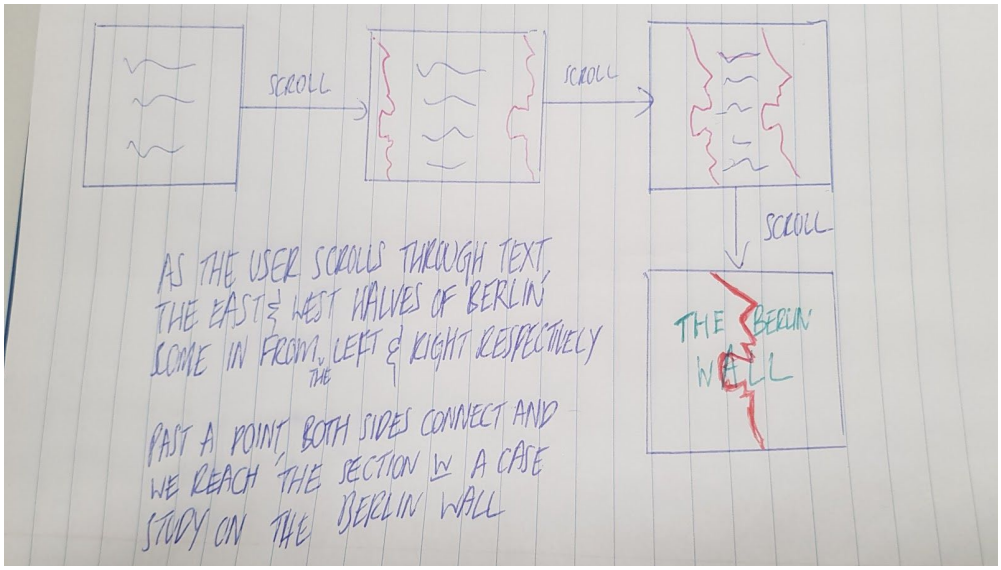
Several storyboards for some of our interactive elements that we'd like to implement on our website:



- Interactive element of our exploratory visualization of border barriers across the world; builds upon the earlier visualization and has available tooltips along with selection options for in-depth examinations
- Minimalist design and lack of context prevents users from being overwhelmed; meanwhile, the lack of detail encourages investigation and exploration

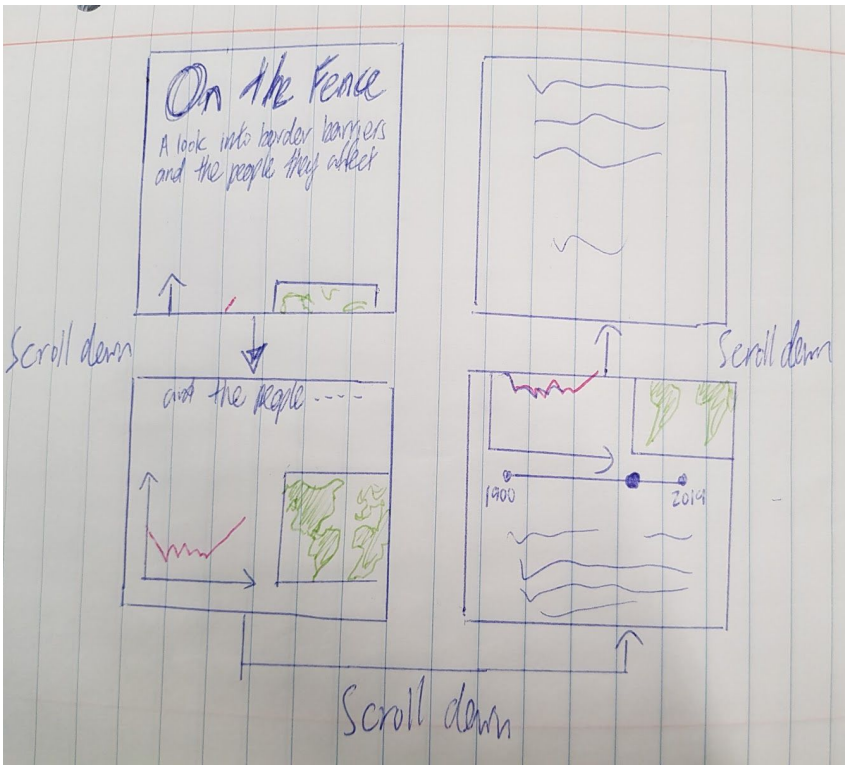


- Interactive choropleth map enables users to hover over regions to obtain summary statistics and zoom into regions on click



- Interactive transition; the left and right sides of the screen has the Berlin wall sliding in and joining together in the center as a means to segue into the German case study

Webpage layout

- Minimalist design with few visual elements beyond our intended visualizations
- Color palette will either be predominantly white or some dark shade; colors will largely be confined to the visualizations and any images
    - Colors will mostly either be sombre or based on some intuitive associations (e.g. blue for water on maps; green for land)
- Website format will be in the form of a long scrollable page; a largely linear format such that viewers can easily follow the chronological flow of our narrative and not merely skip bits of exposition[5].
- The various sections of our site will either feature no visual signposts (i.e. merely some text to indicate the title or topic of our section) or some simple minimalist graphics that align with our theme
    - Barbed wire coils
    - Fortress-like walls
- Brief sketch of layout
- 

[5] The long-scroll format will be similar to that of some of the past-year projects e.g. https://cs171-final-project.herokuapp.com/index.
http://jangeffert.com/the-visual-q/

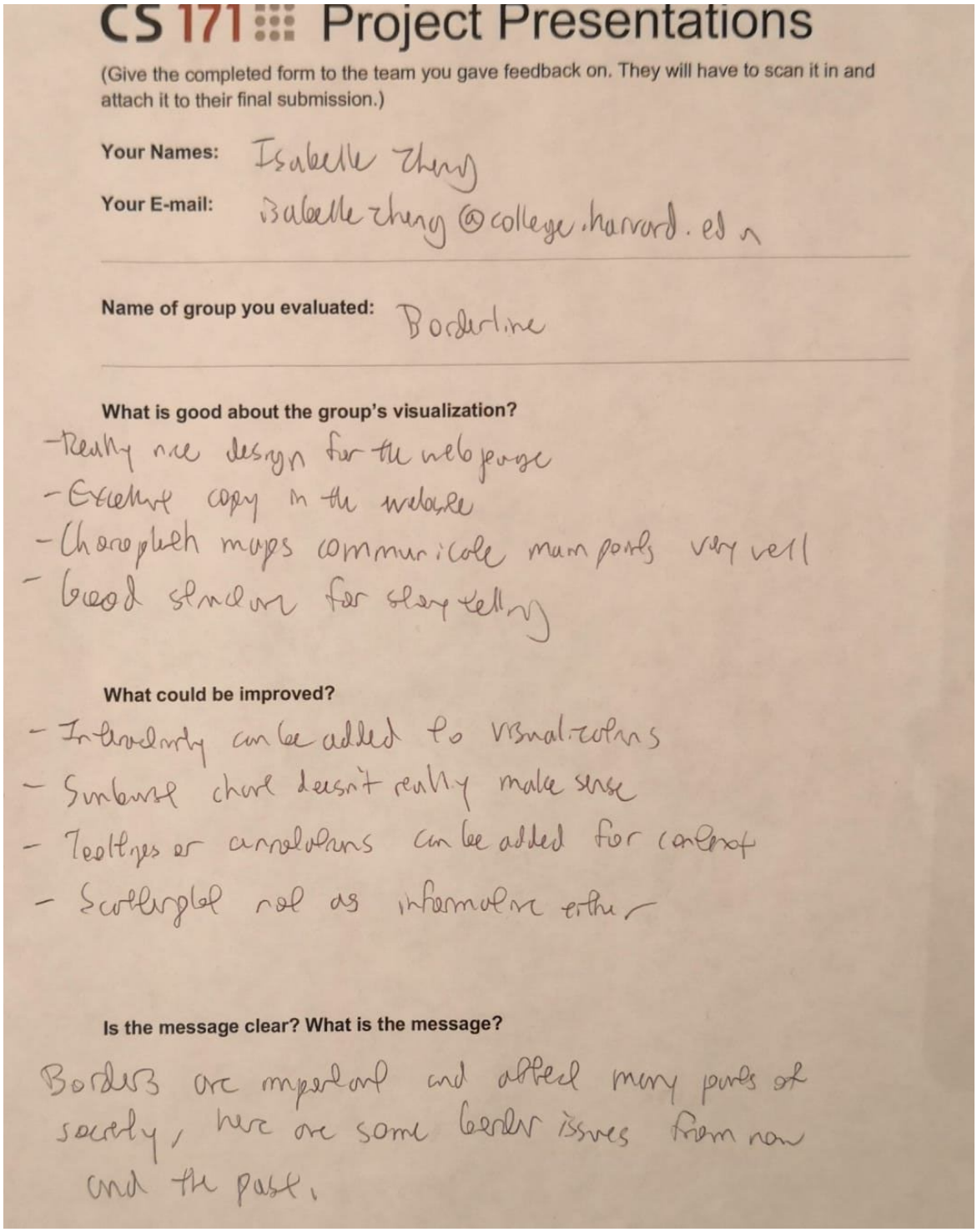
User studies

Our team conducted three tests; we had one think-aloud test with Isabelle; we had two discursive tests with Christopher and Simon.

Think-aloud Test: Isabelle

- Prototype 1:
    - Interactive elements are cool and aesthetically appealing (for the sunburst chart and the line graph) but it is not clear how they relate or how we should interpret them.
    - The choropleth map is cool but the axes, legend, and labelling need to be clearer.
        - A scrollable visualization where the visualization updates as the user scrolls would be nice
        - The buttons are in odd places and are not easy to find
        - Transitions are nice
        - The visualization drives home the point really well but we should try to somehow relate it back to the story
    - It would be nice to have some indication of when major changes are at for the line graphs; for instance, the Great Recession or other key events
    - Radial plot is still somewhat interpretable even though it doesn't work; should include clearer legends
- Prototype 2:
    - The style is nice and the scroll format is slick and intuitive
    - Font is a bit small and the spacings are inconsistent
    - The intro is good and clear but a bit long. Perhaps a shorter executive summary bit might be clearer and more effective; potentially spread across two slides
    - History section:
        - Lack of axes in the diagrams
        - Lack of titles limit how readable and interpretable the graph is
        - Maybe include arrows or a legend to show how the graph relates to the textual content

- Need a better transition in between the history section and the case study section; more logical connection and textual relevance
- Font is nice and the design is great but a bit too small
- The sections need to be clearer and more well-defined



CS 171 Project Presentations

(Give the completed form to the team you gave feedback on. They will have to scan it in and attach it to their final submission.)

Your Names: Isabelle Zhang

Your E-mail: isabellezhang@college.harvard.edu

Name of group you evaluated: Borderline

What is good about the group's visualization?

- Really nice design for the webpage
- Excellent copy in the website
- Choropleth maps communicate main points very well
- Good structure for story telling

What could be improved?

- Interactivity can be added to visualizations
- Sunburst chart doesn't really make sense
- Tooltips or annotations can be added for context
- Scatterplot not as informative either

Is the message clear? What is the message?

Borders are important and affect many parts of society, here are some border issues from now and the past.

CS 171 Project Presentations

(Give the completed form to the team you gave feedback on. They will have to scan it in and attach it to their final submission.)

Your Names: Christopher Kinyua

Your E-mail: Christopherkinyua @ college.harvard.edu

Name of group you evaluated:

Borderline

What is good about the group's visualization?

- Their visualizations tell a story and make the desired points.
- The website is visually appealing

What could be improved?

- For some of the visualizations, its difficult to tell what is being represented (how to read it) without instructions from the presenter, but once explained they make sense.
- A lot of the visualization lack a legend or don't imply a connection to another visualization even if they are connected.

Is the message clear? What is the message?

Borderlines have far wider implications for societies than people tend to realize.

CS 171 Project Presentations

(Give the completed form to the team you gave feedback on. They will have to scan it in and attach it to their final submission.)

Your Names: Simon

Your E-mail:

Name of group you evaluated:

What is good about the group's visualization?

→ Website VERY SLICK
→ Good Narrative Structure
→ German Choropleth is Great

What could be improved?

→ Highlight Section Youre In
→ Color Scheme on choropleth is a bit Jarring
→ I think that adding More info to the Cards of Borders other than text (Choropleth) would be intresting
→ Sunburst May be More confusing than it's worth

Is the message clear? What is the message?

Very → the narrative is great, though I would really like to see the cards stick the landing