World-Wide Gender Statistics

VIsualization for Data Science (CS 6630-001 Fall 2020)

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BASIC INFO

Trisha Gangadhar , u1302432 , trisha.gangadhar@utah.edu

Tamanna Motahar , u1342873, u1342873@utah.edu

Project Repository -
https://github.com/tmotahar20/dataviscourse-pr-worldwide_gender_gap2020

Table of Contents

1. BACKGROUND AND MOTIVATION

Our Project aims to showcase the "*Gender gap*" between Men and Women in different aspects across the Globe.

When we speak of the "*Gender gap*", we are referring to systematic differences in the outcomes that men and women achieve in the labor market. These differences are seen in the percentages of men and women in the labor force, the types of occupations they choose, and their relative incomes or hourly wages.

As feminists , We often read about gender discrimation in workplaces , in daily life, the changing laws to curb such discrimation and the progress that's been made on it so far. We truly believe that development will only be sustainable if its benefits accrue equally to both women and men.

Although the change has been slow and incremental , The past decade has seen important progress for women and girls. But the change has been uneven across the world , some countries have made significant progress in narrowing down the gender gap while some are far behind. Both of us belong to countries that have been slower than westeren countries in achieving this equality.

We wanted to showcase these changes while also highlighting the shortcomings that are yet to be overcome through our project to inspire more people to get involved and focus on closing the gender gap.

2. PROJECT OBJECTIVES

In several political debates, policy reports, and daily news, we often encounter the term “gender gap.” The gender gap, in terms of economic inequality, can be explained with some metric (e.g., wages, assets) that captures the concept within many possible directions. In our data exploration project, to demonstrate the worldwide gender gap, we will focus on different indicators of gender inequality.

Indicators:

1. Participation of women in purchase decision

In many countries, women have minimal influence over household decisions. For example, women often cannot participate in the purchase decisions for their families. In our project, we will explore how the purchase decision making by women varies in different countries.

2. Land ownership of women

Land ownership is an essential aspect of economic inequalities between men and women in several countries of the world. Women do not have the same rights to own property as men in many countries. To demonstrate the gender gap in the ownership of assets, we will show the discrepancies in land ownership in our project.

3. Unadjusted gender gap in average hourly wages

It was found in different data sources that the earning of women is less than the men, and the difference is enormous in amount. By demonstrating the average hourly wages of women compared to men worldwide, we want to show in our project how women suffer from economic inequality.

Projected Actions and Tasks:

1. Discovering the regions/countries where the maximum/minimum gender gap exists for each indicator.
2. Exploring the gender gap trend of different regions/countries in the year scale.
3. Comparing the indicators for different regions/ countries and finding out which indicators contribute towards the maximum/ minimum gender gap.

Users of the VIsualization:

Academician, social workers, and different government agencies might use the visualization for data exploration

3. DATA & DATA PROCESSING

We got our dataset from the world bank , specifically from the link below https://datacatalog.worldbank.org/dataset/gender-statistics, it's The World Bank's Data Catalog.

The dataset includes multiple files and is quite large. It consists of over 4,000 internationally comparable indicators that describe education access, wages, women in different job categories, literacy, land ownership and purchase decision making. We do not intend to use all of them for the purpose of this project as this might cause a lag in the webpage. We plan to use indicators that fall under the three essential categories: *average wages*, *household purchase decision*s and *land ownership*. This will allow us to effectively visualize the Gender Parity Index, wage differences across regions/countries and amongst different age groups with respect to the economic state of the country. We also intend to show a global trend by comparing country statistics with the global data.

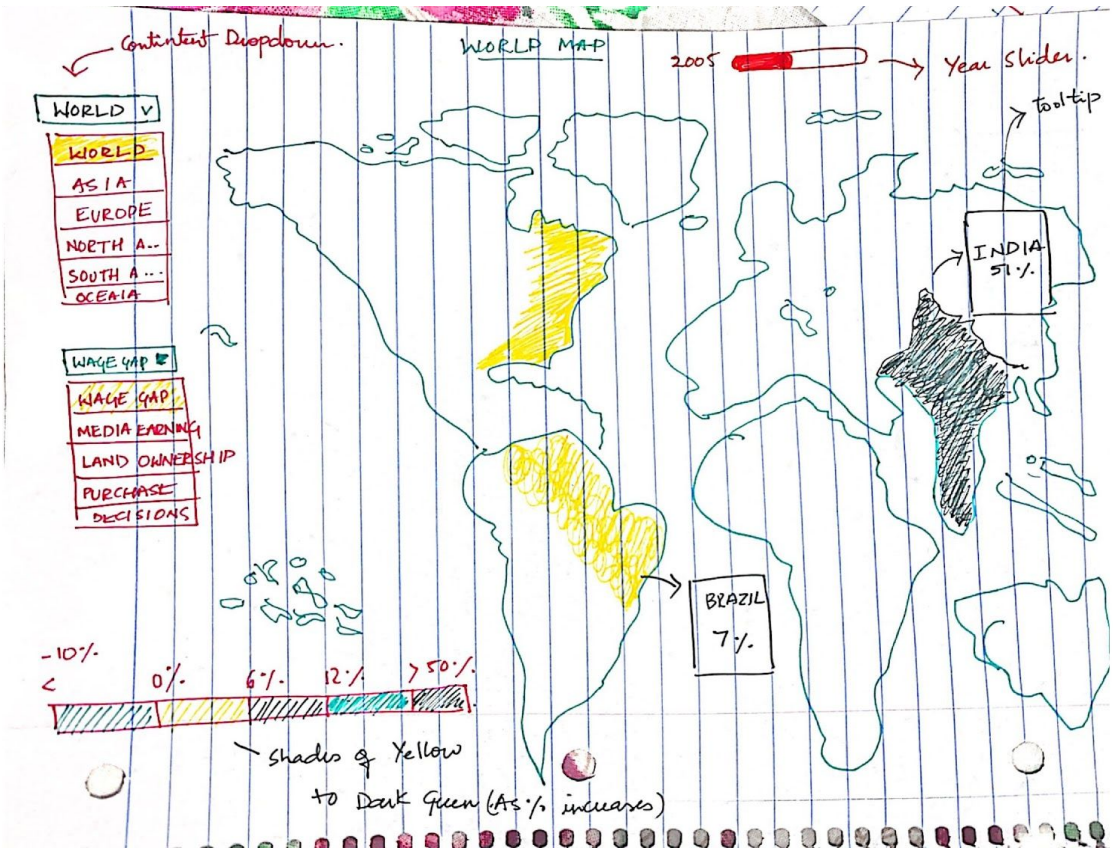
Since the data we want to use for this visualization is scattered over multiple csv files, we need to extract only the data we require depending on the indicators, region and countries. We plan on doing this using Python or Javascript.

4. VISUALIZATION DESIGN

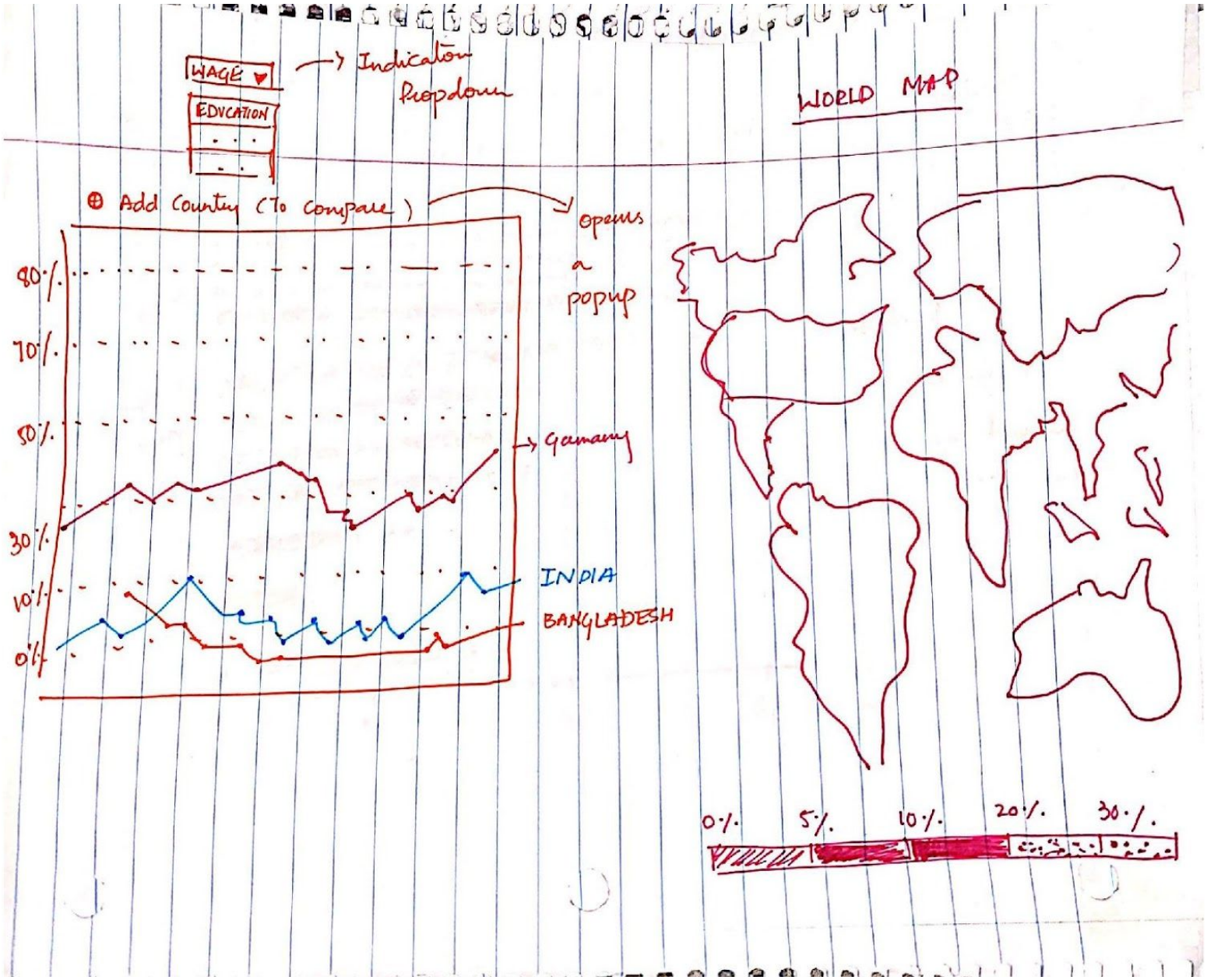
4.a Prototype 1:

We used some ideas from the assignment 4 for our first prototype. The features include:

- ➔ Select from the continent drop down to see data for a particular region.
- ➔ Select the particular country/region using the map.
- ➔ Select the indicator to see data for.
- ➔ Use the year slider to observe the trend over years.
- ➔ The color encoding indicates the percentage , the darker the shade of green, higher the percentage.
- ➔ Hovering on the map also brings up a tooltip indicating the exact percentage.
- ➔ Clicking on the percentage scale will show all countries in that percentage range.

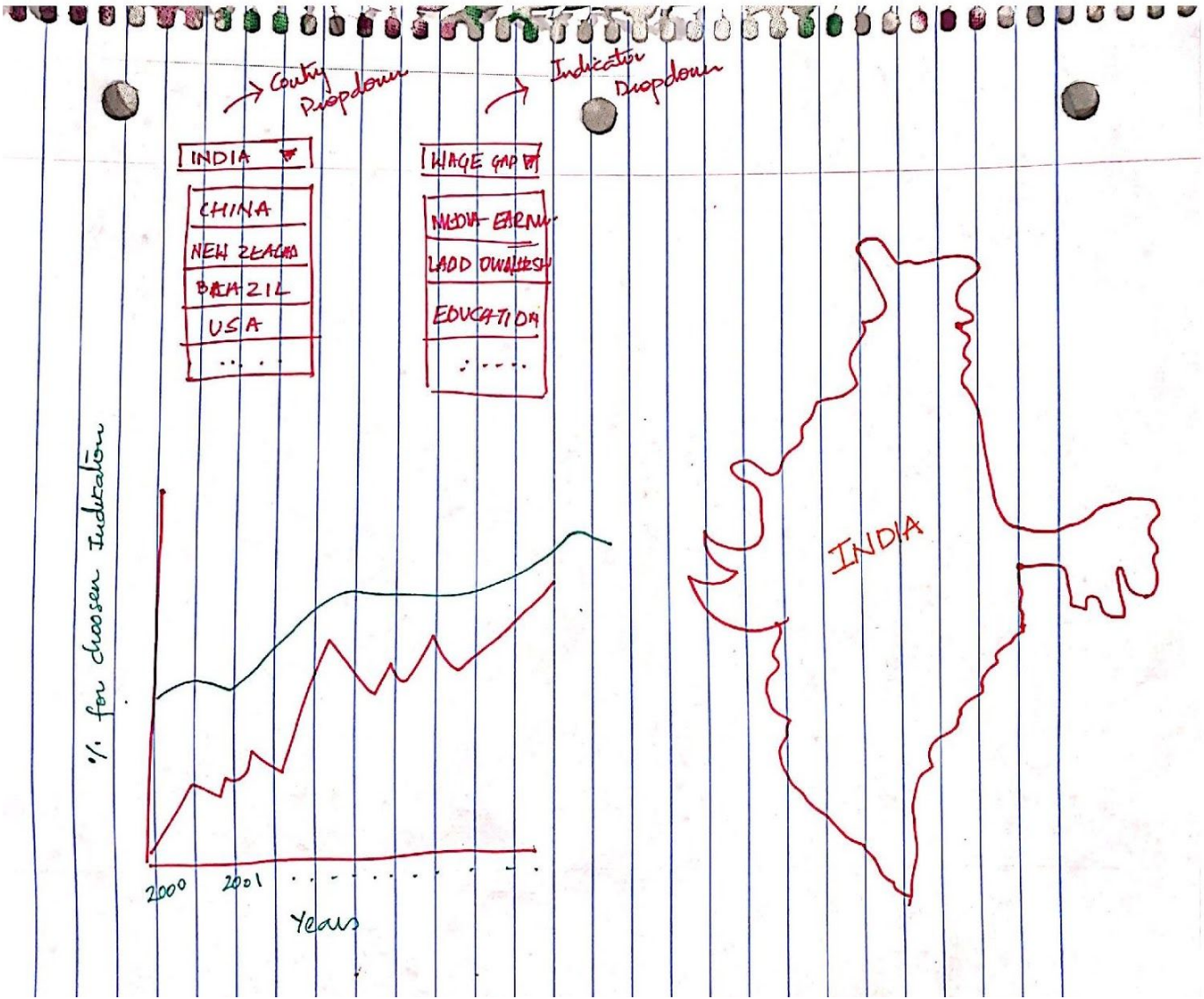


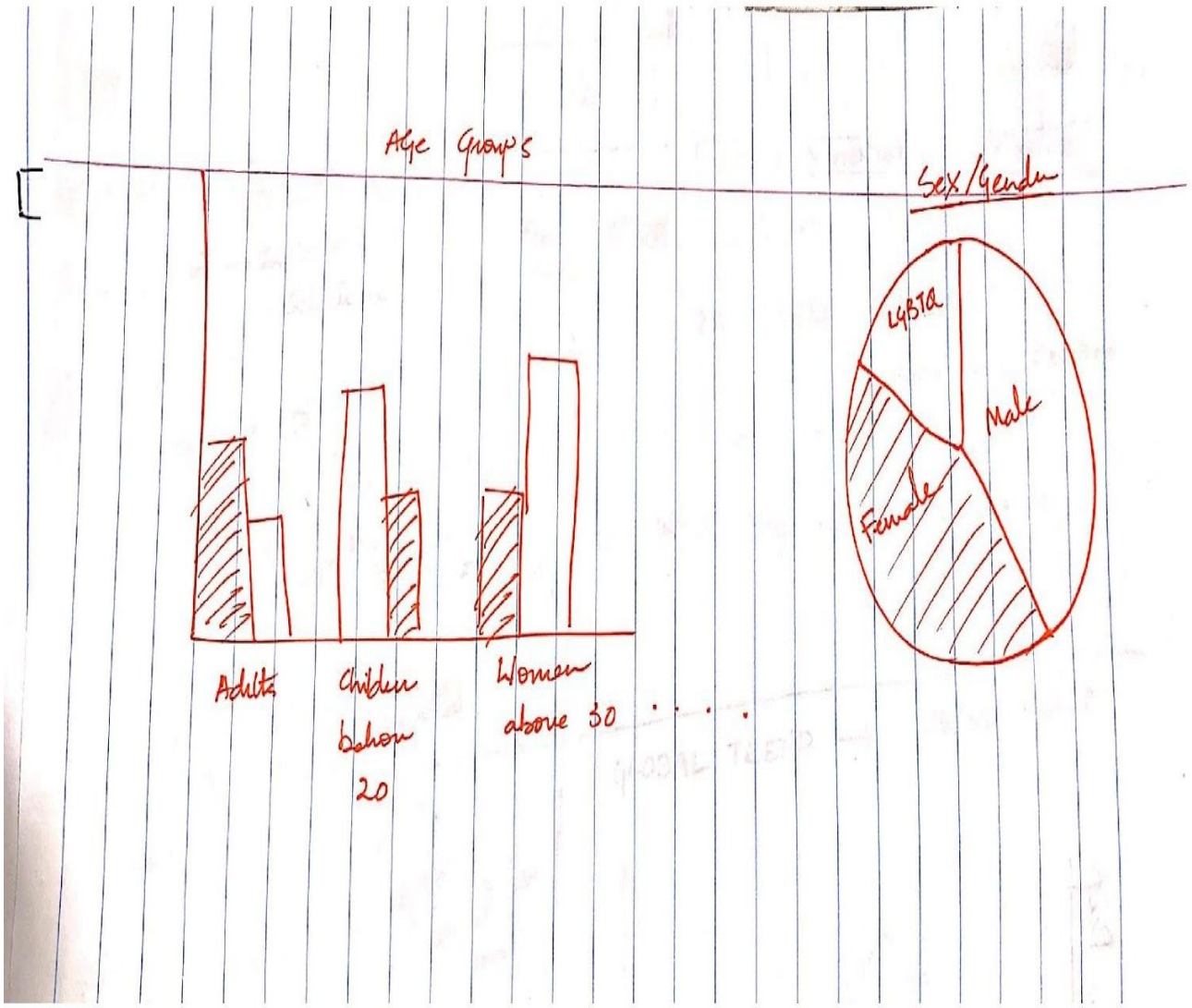
- ➔ The second half of the screen will provide a drag and drop option for countries you'd want to compare.
- ➔ The add country plus sign opens a popup with all countries we have data for and the user can use the checkbox beside a country to select as many as 10 and click okay to compare them for the selected indicator.



4.b Prototype 2:

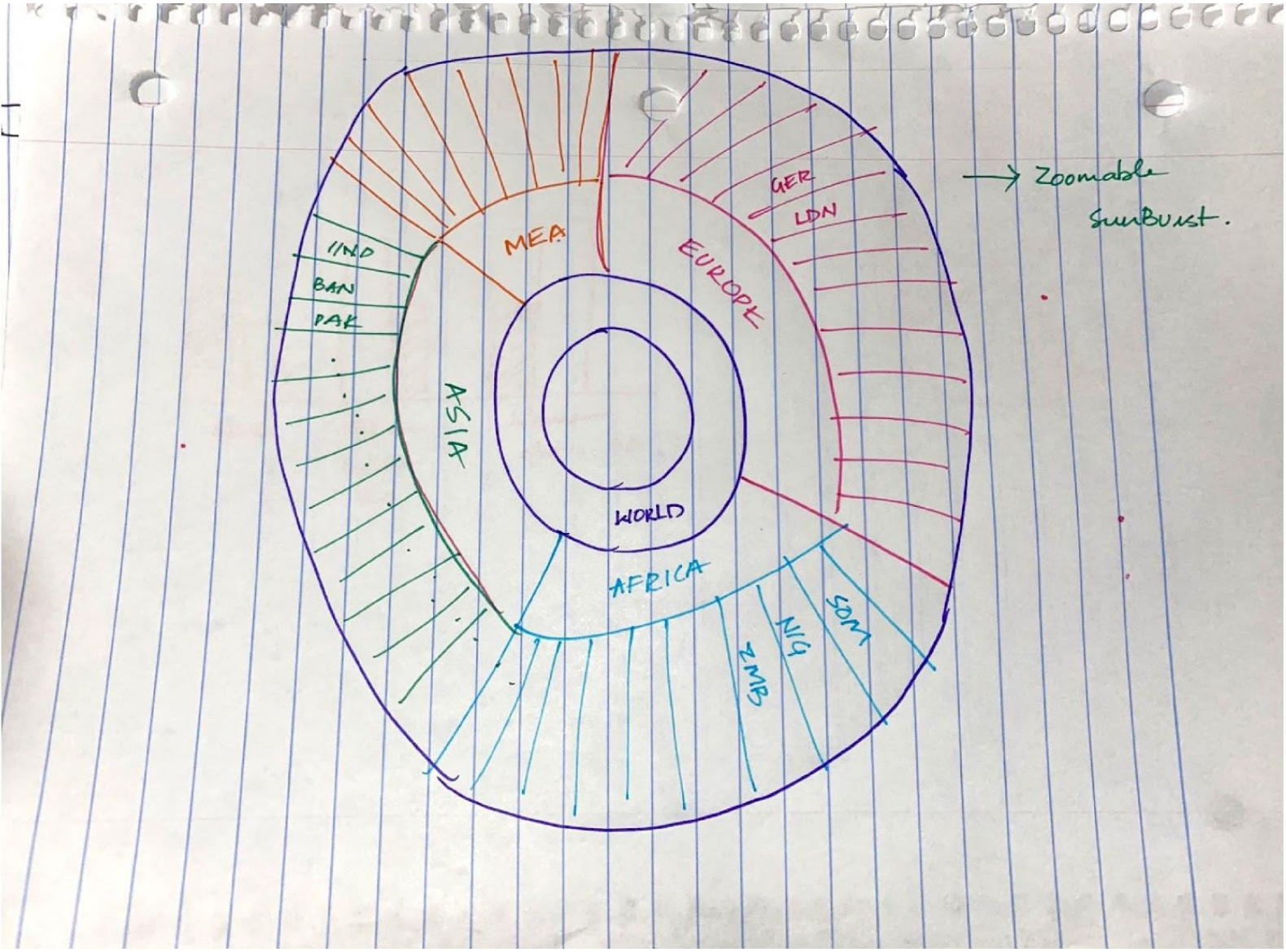
- ➔ Select the country you want to visualize the data for.
- ➔ Select a single indicator from the provided dropdown.
- ➔ Based on the country and indicator selected, the visualization will show the trend for the particular indicator for the last two decades.
- ➔ For example, choosing India as the country and sex as the indicator, we show a pie chart with the ratios since there are only two values whereas selecting India as the country and education level as the indicator, will show adjacent bar charts.
- ➔ On clicking the bars or sections, more details will be shown.
- ➔ There will also be a line graph shown in the first half of the screen comparing the selected country with the global trend/average.



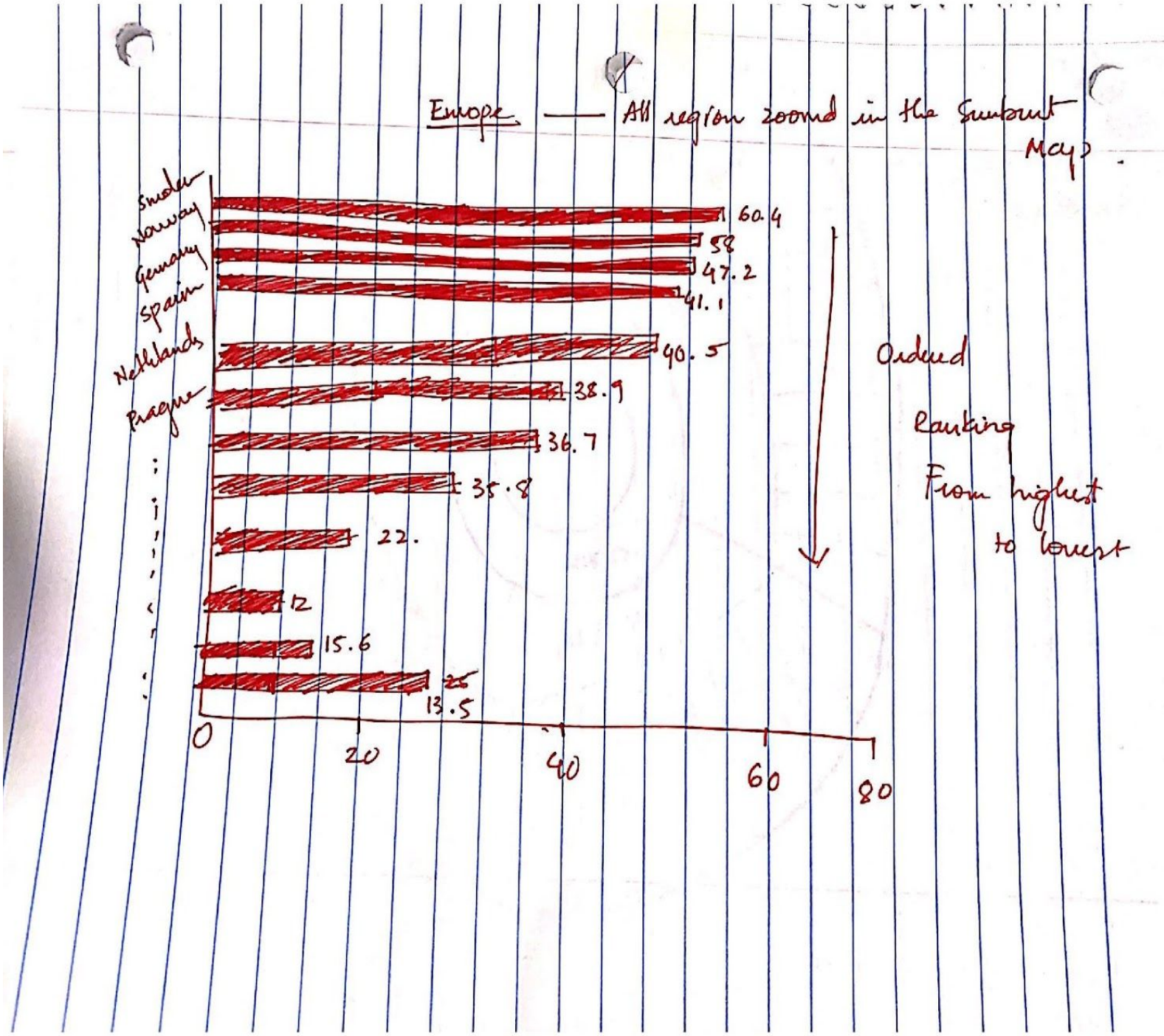


4.c Prototype 3:

- ➔ Sunburst chart with distortion that displays hierarchical data.
- ➔ First level of the hierarchy is represented by regions which drill down to countries, with the World map being the innermost circle at the top of the hierarchy.
- ➔ Clicking on a particular region in the sunburst chart will zoom in and display all countries in that region
- ➔ Currently we have 5 regions , but could divide into more sub regions depending on how it looks and fits into the space.
- ➔ On clicking the region, a bar graph comparing all the countries in that region will be displayed.
- ➔ On click on the world circle , the 5 main regions will be displayed in the bar graph.

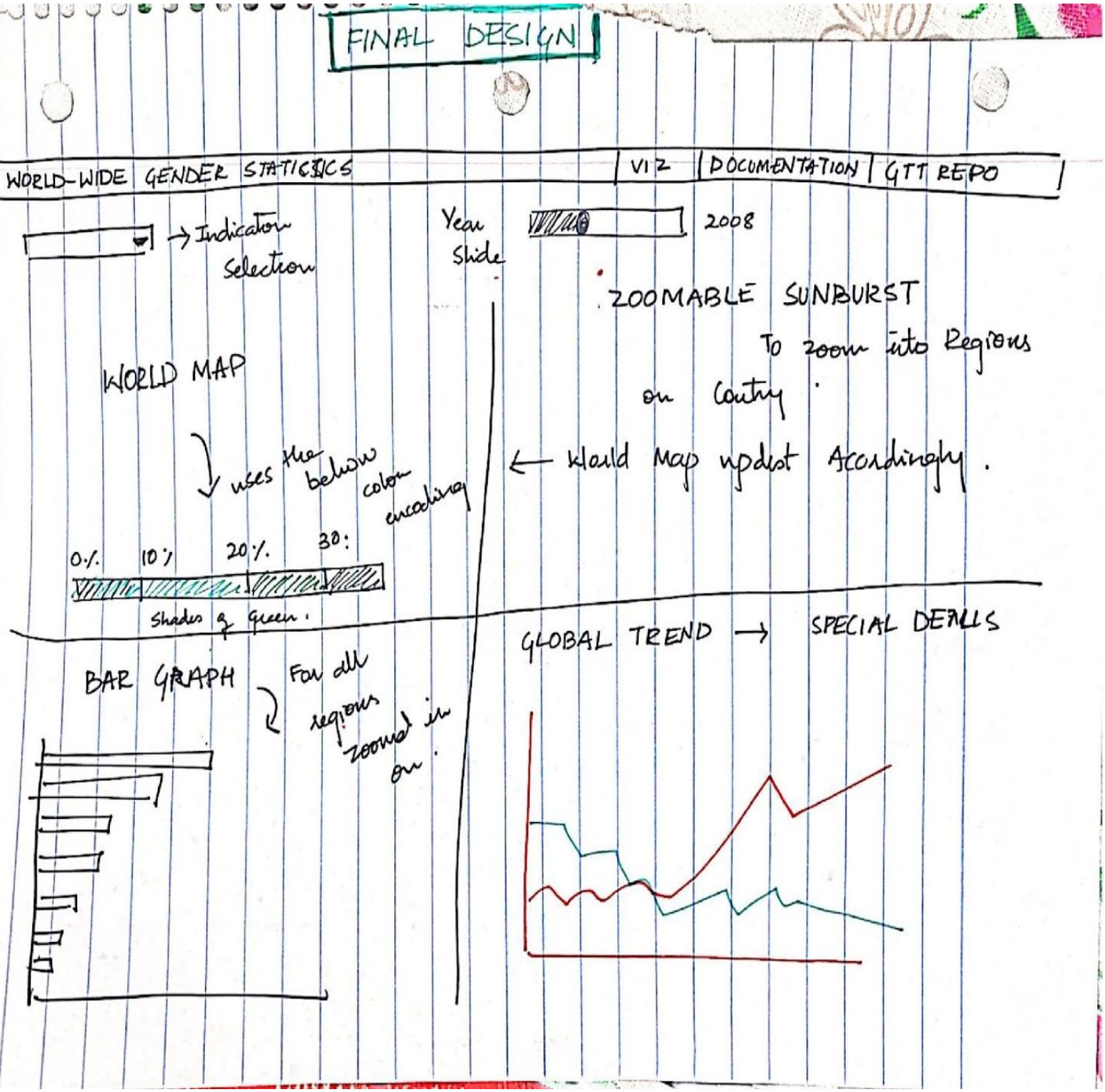


- The bar chart will be ordered in a descending order by its exact percentage value.



4.d Final Design :

- ➔ We picked up aspects from each of the prototypes that will help us tell the story and visualize gender statistics trends.
- ➔ World Map that is colored based on the regions such as Sub Saharan Africa, East Asia & Pacific etc *(Left side of first half of the screen)*
- ➔ Sunburst Chart with distortion that displays hierarchical data. First level of the hierarchy is represented by regions which drill down to countries, with the World being the innermost circle at the top of the hierarchy *(Right side of first half of the screen)*
- ➔ Bar chart that shows the trend for the selected indicator over the last 2 decades between the countries in the region selected through sunburnt or map. *(left side of second half of the screen)*
- ➔ Select the region/country that you want to visualize the trend for
- ➔ Select the indicator to observe data for *(Top of the screen)*
- ➔ Select the year slider to observe the trend over years *(Top of the screen)*
- ➔ Check the compare option to compare the global and country/region specific trends with a Line Chart. *(right side of second half of the screen)*
- ➔ We plan to divide the screen into 4 parts.
- ➔ We will host this as a web page which will also link to our data and the git repo for easier access.



5. MUST-HAVE FEATURES

1. We will use the Winkel Tripel projection for the world map, to minimize all distortions (area, angle, distance).
2. World map will be colored according to the percentage scale (0-10%, 10- 30%, 30 -60%, 60 -90%, 90-100%) of the indicators.
3. According to the percentage scale, different shades of a single color will be shown in the world map
4. There will be drop down menus for indicator selector. The indicators are inequalities in wages, ownership of land and purchase decisions.
5. We will have country selection through the map for the ease of navigation.
6. Country wise sorting in bar chart which will let us see which country has the highest and lowest gender gaps
7. Zoomable sunburst which will allow us to zoom into the regions.
8. We will have region wise trends for each indicator through line charts.
9. There will be a year slider to select a specific year for data.
10. The tooltip feature will be added to the world map to see the indicators' values on mouseover.

6. OPTIONAL FEATURES

1. We want to add country wise details along with the country map on click. Additionally the details of the indicators will be shown with the country map in a smaller window.
2. If we select any of the indicators and click on the “show highlights” button, it will show the most important points of the data (storytelling).

7. PROJECT SCHEDULE

I. Week 1 [Oct 29- Nov 5]

Do the data processing required for the visualization

Host the project on github

Divide different features among the two team members

II. Week 2 [Nov 6 - Nov 12]

Work on getting a basic working prototype

III. Week 3 [Nov 13 - Nov 19]

Have the working prototype ready with the world map, sunburst chart and barcharts.

IV. Week 4 [Nov 20 - Nov 26]

Work on incomplete functionalities of the prototype

Have the basic visualizations working without any glitches

V. Week 5 [Nov 27 - Dec 3]

Complete the Project and work on project video

Add rest of the planned functionalities

Fix bugs

8. PROJECT GANTT CHART

	Week 1 [Oct 29- Nov 5]	Week 2 [Nov 6 - Nov 12]	Week 3 [Nov 13- Nov 19]	Week 4 [Nov 20- Nov 26]	Week 5 [Nov 27- Dec 3]
Data processing					
Basic Working Prototype					
Working Prototype Ready (world map, sunburst chart and barcharts)					
Complete all Functionalities					
Project Completion and documentation					

Table 1. Estimated timeline.