6630 Visualization for Data Science Proposal

Basic Info:

- **Project Title: Worldwise trade data (importing and exporting) visualization**
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- **https://github.com/YosefQiu/VIS_FinalProj**

Background and Motivation.

In today's economic globalization, trade between the two countries is likely to cause economic instability in a third country. In particular, this year, due to the impact of the coronavirus. The economies of various countries have been greatly affected. Therefore, we want to explore economic changes through trade differences between different countries. One of our common friends is an economics major. After listening to his views on the economy for a long time, we are all interested in the topic of economics. Moreover, in the current market, most of the economically related visual rendering results are relatively simple, or users are required to have certain

economic-related background knowledge. Therefore, we want to try to make an economically relevant visual web page for most ordinary users.

Project Objectives:

How have the trading trends changed since 21 century? What's the impact of China joining the WTO? How has the Covid-19 affected the trading statistics in recent years? What's the trading portion of each country in the worldwide trading system? Do anti-globalization trends affect the economy? We will learn how to visualize complex data using HTML, SVG, and d3. Primarily, the world bank data contains multiple categories, so we will learn about how to filter data and possess data using proper computer language. Other than that, this visualization project will be helpful for education or research related to global relationships or the global economy.

Data.

We will get data from the world bank. The world bank provides complete data from the last century to the current year. We will focus on the import and export of data from different regions and different countries.

Data sources. https://wits.worldbank.org/CountryProfile/en/Country/CHN/Year/2020

Data Processing.

We will download the trading data of large regions or countries. Each excel table contains the trading data of one country. One axis represents the year, the other axis represents the country partner (double the rows for importing and exporting data). We plan to process data using python. Since python has a substantial amount of library support for data processing like NumPy, pandas, etc. We will save a lot of time by processing the data via python. Then we will export the fined data to a CSV file. Javascript will read this data and pass it to the font end. Our final data will look like this: a list of objects. Each object is a country or region. The value other object will be either import or export. Import or export object contains 2d data, representing for trading partner and trading year.

Visualization Design. Check out the charts and explanations we put at the end of this file.

Must-Have Features.

- Line chart: history trading data
- Chord chart: trading partner data

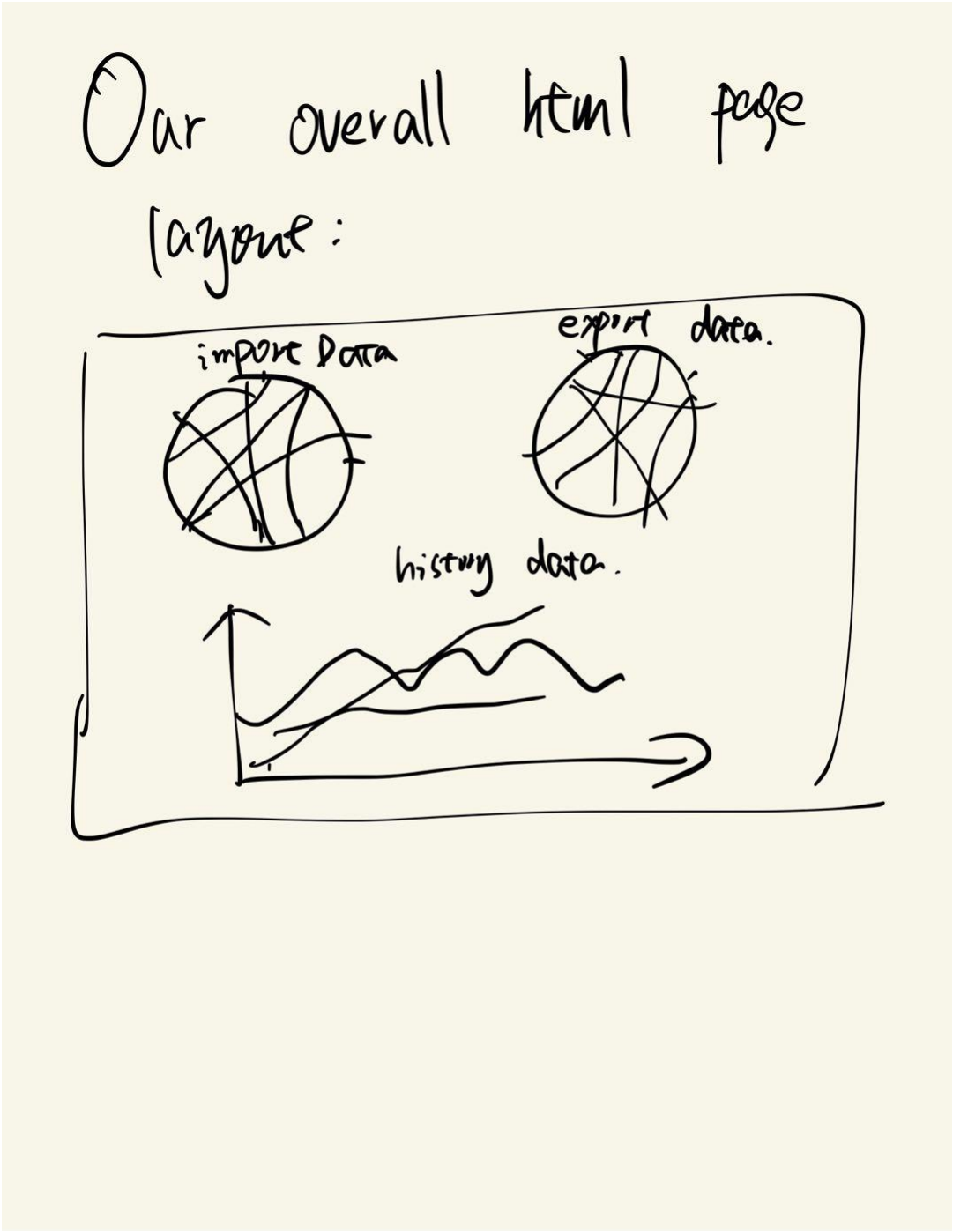
Optional Features.

- World Map chart including trading direction
- One button switch between chord chart and world map chart

Project Schedule

- **Data collection and data process (Done by Oct 30)**
    - One member works on data collection
    - One member works on data processing
- **Html, svg, and javascript set up (mapping all the svg element with dummy data), Done by Nov 6**
    - One member works on data importing, javascript functions
    - One member works on html, svg layout
- **Chord chart and line chart data visualization, done by Nov 11**
    - One works on chord chart
    - One works on line chart
- **Interaction functionality, done by Nov 18**
    - Work together
- **Debug and clean up css style, done by Nov 25**
    - Work together
- **Optional feature, if we have time, done by Dec 2nd**

Plan one(Final design):



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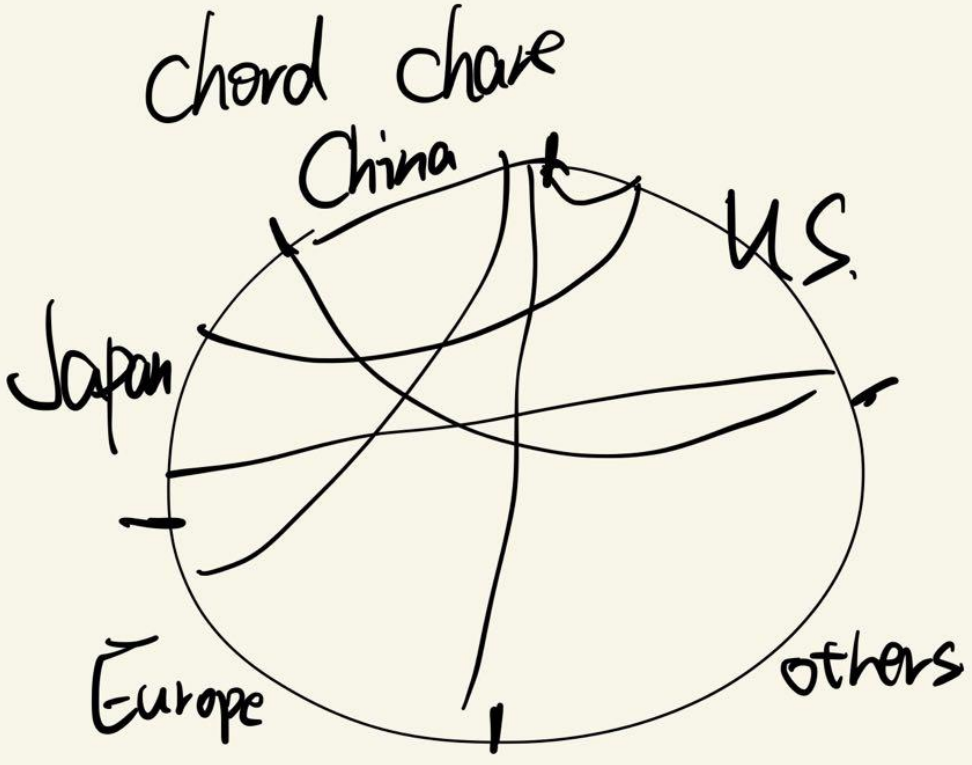
two chord chare on the top. one for import. the other for expore.

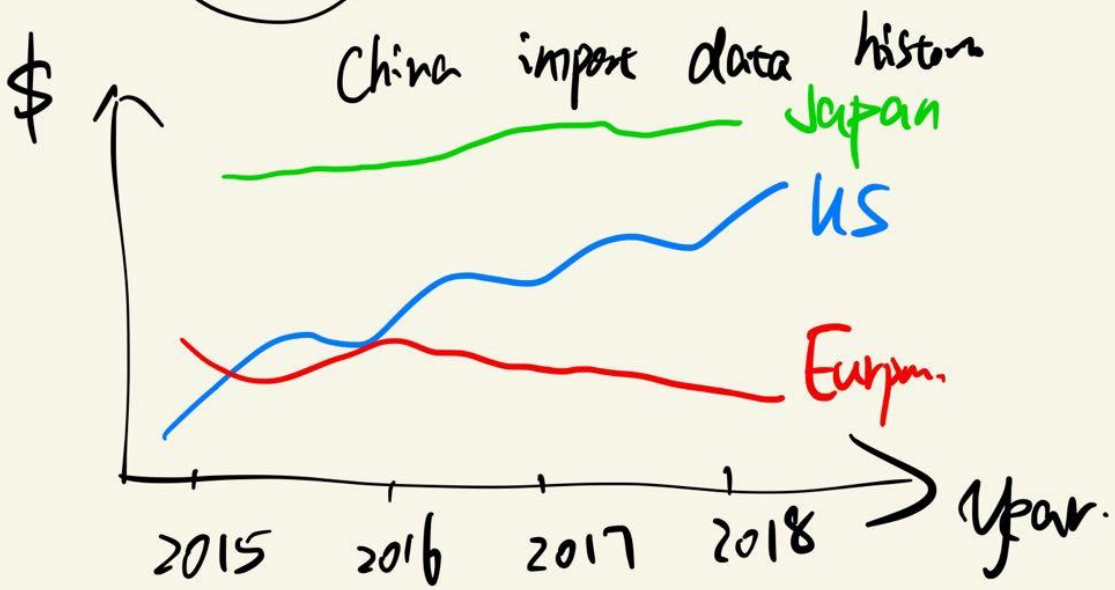
A Line chare is on the bottom.



Chord chart display import or export data of currece year (2022)
Each country / region has a list of data correspond to other country.

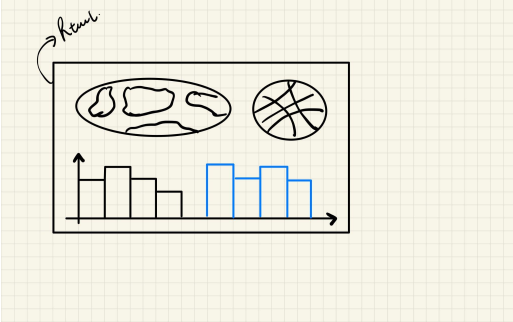
If one country is selected (clicked), the line chart at bottom will highlight all the history data of this country

If China is clicked



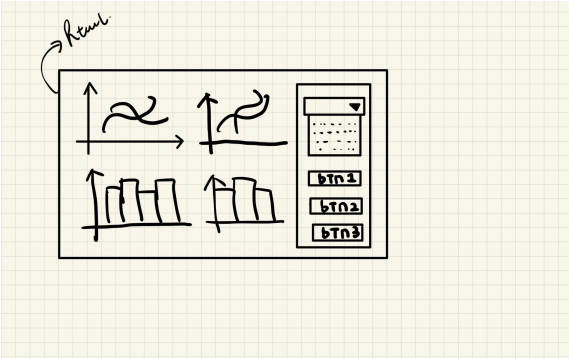
This is the interactive part. The data will show historical import/export data based on user selection

Plan two:



In this design, our visualization project consists of three parts, and in the upper left corner is a map of the world. Users can choose different countries in this graph. And the trade gap between these countries is shown in the chord chart on the right. And show the import and exit in the bar chart below.

Plan three:



In this design, our visualization project consists of three parts. On the right is a design similar to the menu bar. Users can select countries through the drop-down box and the button at the bottom. The line chart shows the trade gap between

countries (including imports and exports), and the bar chart shows the trade gap between continents and continents.