CSE557A Project Proposal

Basic Info

- **Project title: Wildlife Trade**
- **Names:**

Yue Yuan, yuanyue@wustl.edu, 436711
Yuyao Hu, yuyao.hu@wustl.edu, 451796
Hao Sun, hao.sun@wustl.edu, 458716
Xue Zhang, Xue.zhang213@gmail.com

- **Repo Link:** https://github.com/HaoSunWashU/CSE557A_Final_Project

Background and Motivation

Recently, the world's last male northern white rhino has died leaving only two females left to save the subspecies from extinction. It is again alarming us what a severe situation wildlife animals or plants is facing. Worldwide, one in every three **s**pecies of amphibian is endangered, 39 species have gone extinct in the last 500 years and another 130 species are suspected to have gone extinct in recent decades.

Lots of factors have caused fast extinction of wildlife. For this project, we want to investigate the impact of wildlife trade, which is one of the factors that is controversial and also has the greatest impact on wildlife. We won't talk about illegal wildlife trade as its harm is quite obvious. We are going to examine the scale, transaction frequency, change over the years and the impact of legal wildlife trade. Wildlife trade has been a controversial topic for a long time especially in recent years. Lots of wildlife trade are actually legal and used for good reasons like education and medicine. However, as the number of wildlife is decreasing rapidly, is the current status of wildlife trade sustainable? What is the trend or pattern of wildlife trade? If the number of wildlife trade is growing constantly, how fast is it increasing? Is current amount of trade overexploiting wildlife resources? Are there any potential harm these legal wildlife trade? There are the questions that we want to explore.

Project Objectives

1. Explore the trend of wildlife trade over the years (about the most recent 10 years), and usage of traded wildlife
2. Based on the trend/patterns found, identify if there is any anomalies happening. For example, if one species which is not identified as endangered is decreasing rapidly but still are being traded a lot, or if certain area is facing severe environmental issues but is still engaged in large-scale wildlife trade
3. Investigate the impact of current trend/pattern of legal wildlife trade on wildlife.

Data Sources

https://www.kaggle.com/cites/cites-wildlife-trade-database
https://trade.cites.org/en/cites_trade/
http://www.iucnredlist.org

Data Processing

1. For the dataset we got from kaggle which has lots of wildlife trade information, basically no data processing is needed as it is in standard csv format and the data is quite clean.
2. We will need to combine data we got from kaggle, CITES, and IUCN to match the name of species (from kaggle) and the corresponding total amount (from IUCN and CITES).

Visualization Design (See sketches at the end):

1. To identify the trend of wildlife trade, we decided to use world map with flying dots that represent the trade. The dot is going to fly from the export country to import country. The speed of the flying dot will be adjusted based on the amount of wildlife traded. The advantage of this design is that it gives a clear presentation of the frequency of the trading and it is easy for users to identify potential changes and patterns over the years. If we add the optional features of filters, uses will be able to focus on pattern of wildlife trade of one area or for one specific species easily.
    a. Potential alternative design: line chart.
        i. Line chart is good at showing the specific statistics and the trend, but it does not give the big picture or show the whole network of wildlife trade. We could miss patterns if we use it.
        ii. Chord diagram. It can show the whole network and visualize the amount. We rejected because it can't show the change over the years.
        iii. Animated bar graph for amount of traded animals over the years. It is good for comparing trade of different countries and but is inefficient at giving trend. If we want to investigate import and export countries, we will need to create a new one for each of them.
2. To look at the big picture of wildlife trade and identify potential anomalies, we will look at what wildlife and the respective amount used for different purposes. (See sketches for details). The sunburst pie chart is intuitive and totally fit our goal. Alternative designs could be:

    a. Bubble chart: hard to control the circle size and can't make sure that everyone translates the size difference into quantity difference accurately.
    b. Line chart: good for identifying proportion difference but is not interactive enough for users to see proportion of wildlife for different purposes
3. Line chart that shows amount of wildlife traded. Alternative design: bar chart. It makes sense but we are focusing more on the trend and the bars are just distracting. (Not adding sketches because they are too intuitive)
4. Pie chart that shows amount of traded animals vs remaining animals. Alternative design: circle packing. Not using it for the same reason as the bubble chart: hard to translate the size difference.

5. **Must-Have Features**

1. World Map that shows wildlife trade from 2006 - 2018 with expandable filters and animated dots, with each dot representing trade for a certain species and flying from export countries to import countries. The speed of the flying dots will change based on the amount of this certain species in this one single trade. The user can choose one certain year to see the worldwide trading.
2. Sunburst Pie chart that shows distribution of purpose of wildlife traded. The pie chart in the center will show proportion of the purposes, and when clicking on one purpose, the user will see the proportion of different kinds of wildlife traded for this purpose.
3. Line chart that shows amount of wildlife traded. The line chart will be made interactive which allows users to see a trading amount of a particular year or a country.
4. Pie chart that shows amount of traded animals vs remaining animals

Optional Features

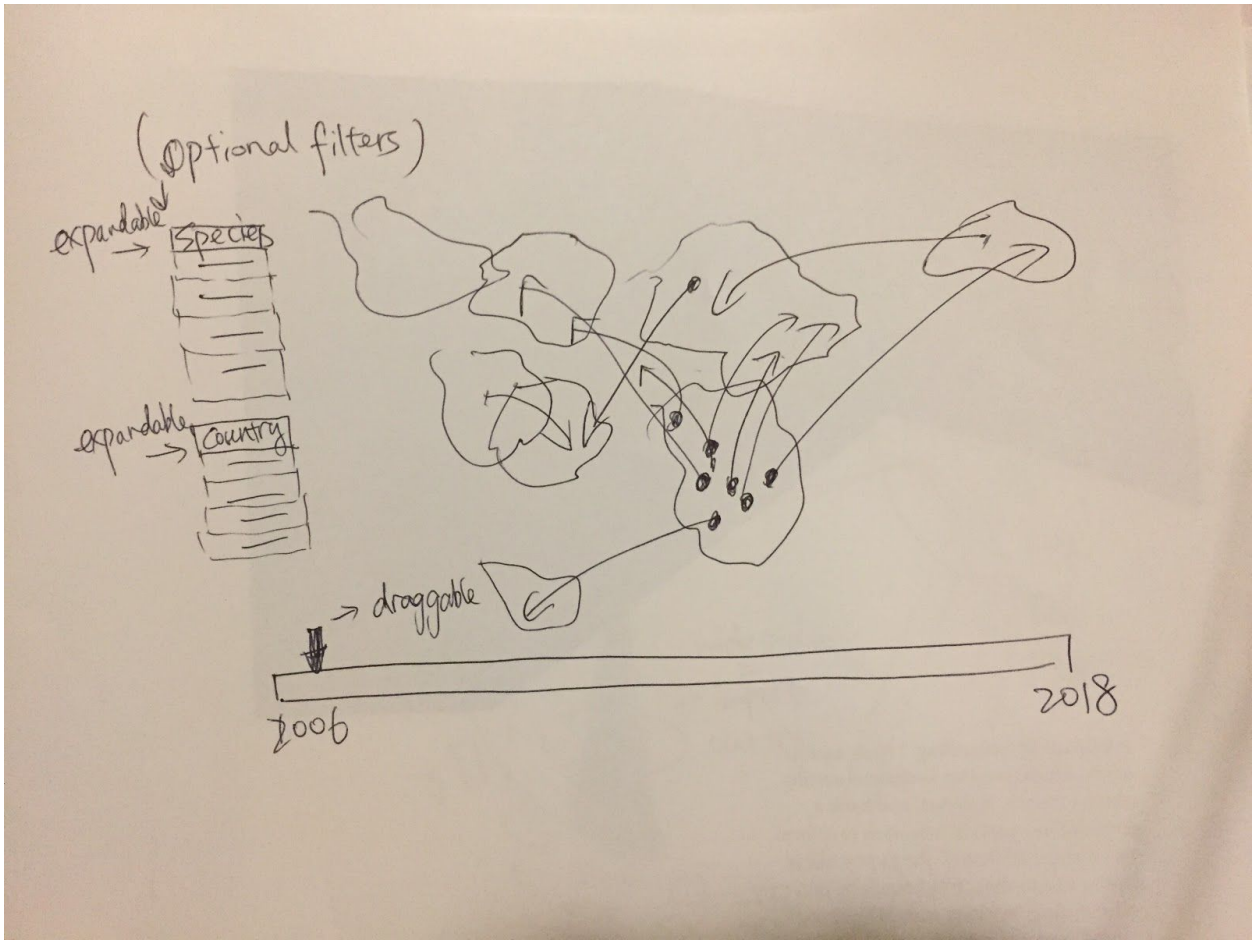
1. The world map will allow user to see the animated trading dots based on filters such as countries and species

Project Schedule

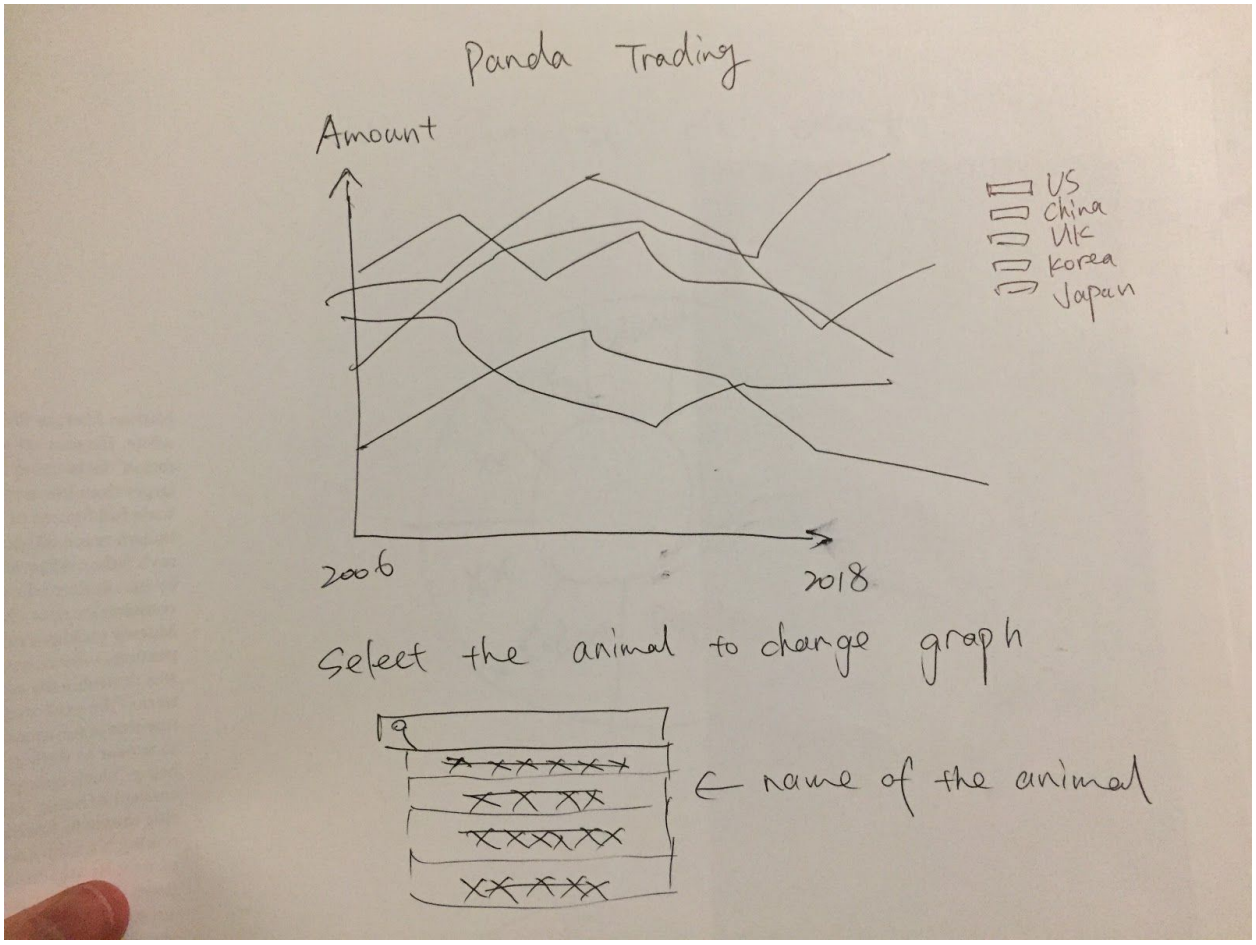
April 3 - 5	Refine Visualization Design
April 6 - 7	Data Processing and Scraping
April 8 - 15	First round of visualization implementation
April 15 - 17	Identify Patterns and do further analysis
April 17 - 21	Second round of visualization design refinement
April 21 - 30	Refine Implementation
April 30 - May 8	Work on process book and practice presentation
May 9	Presentation

Sketches

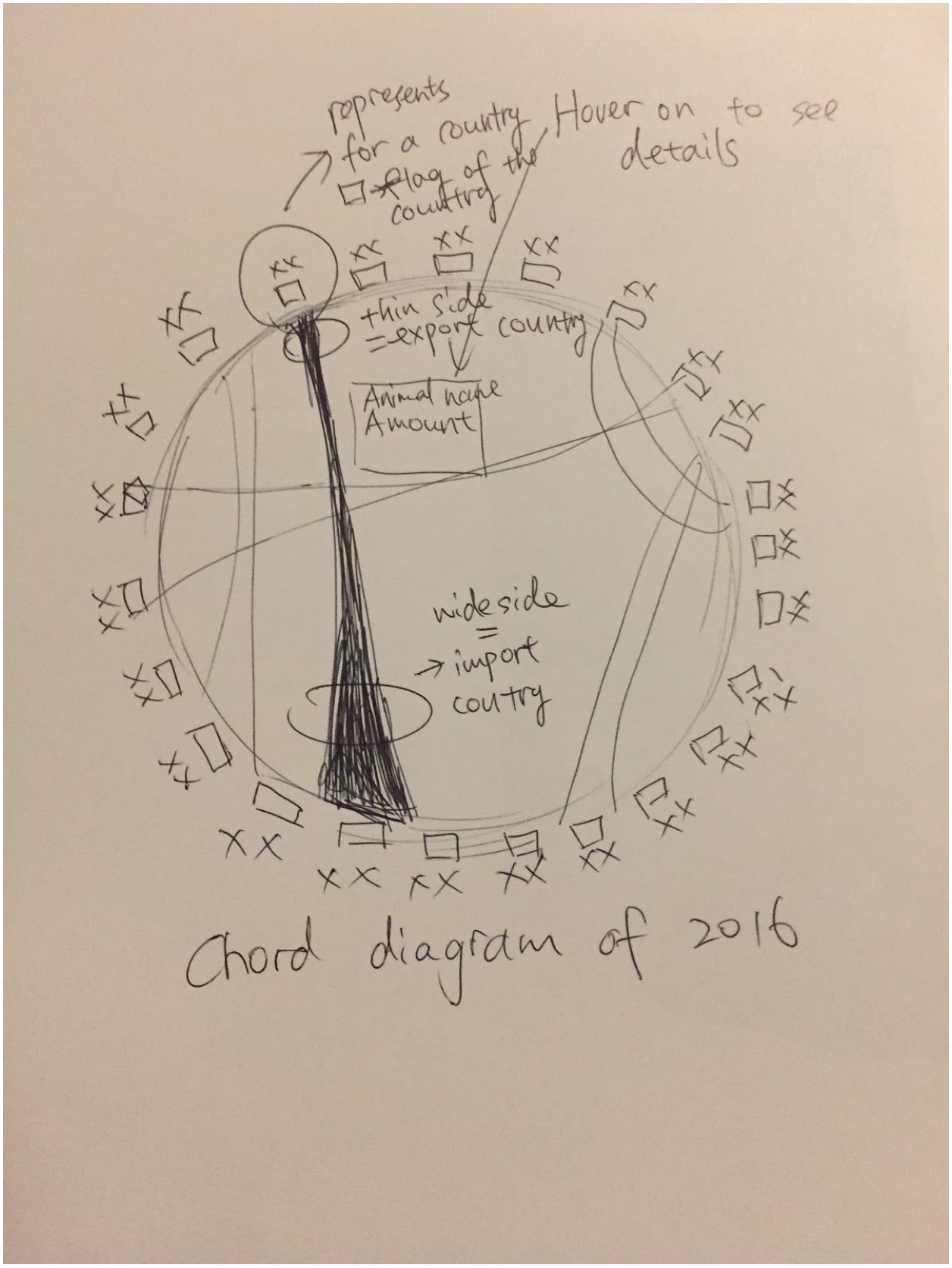
1. World Map



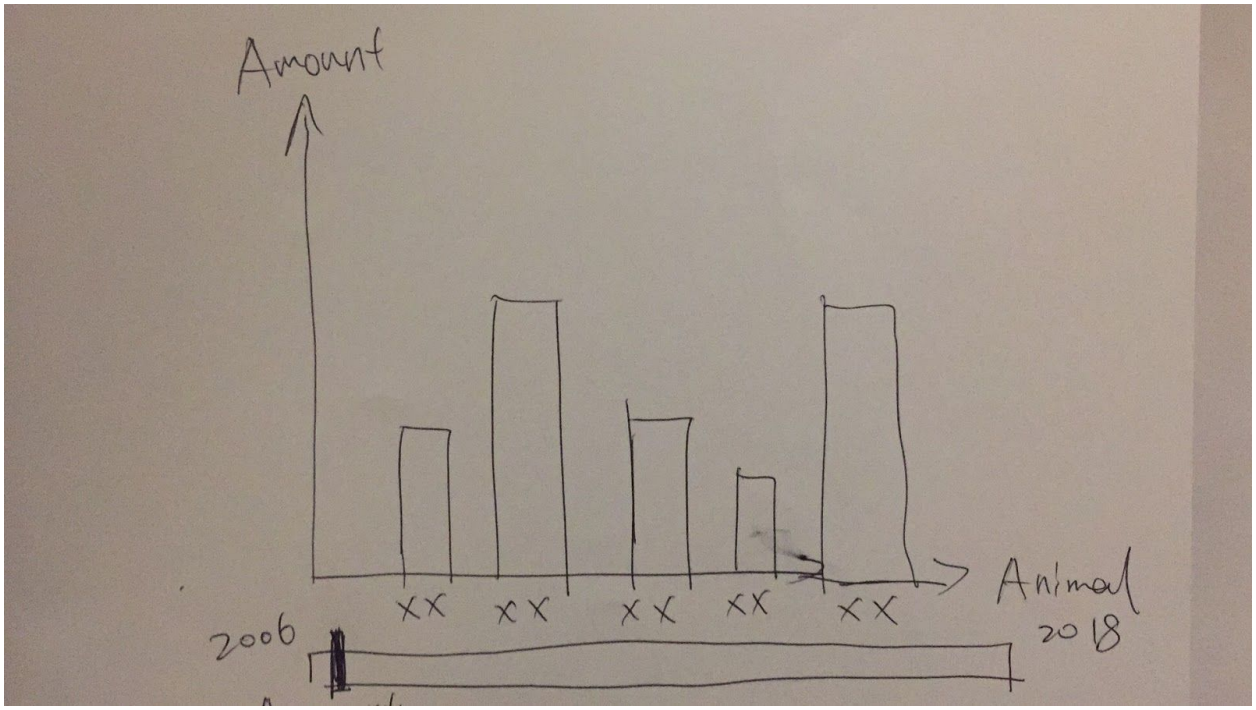
1a. Line Chart



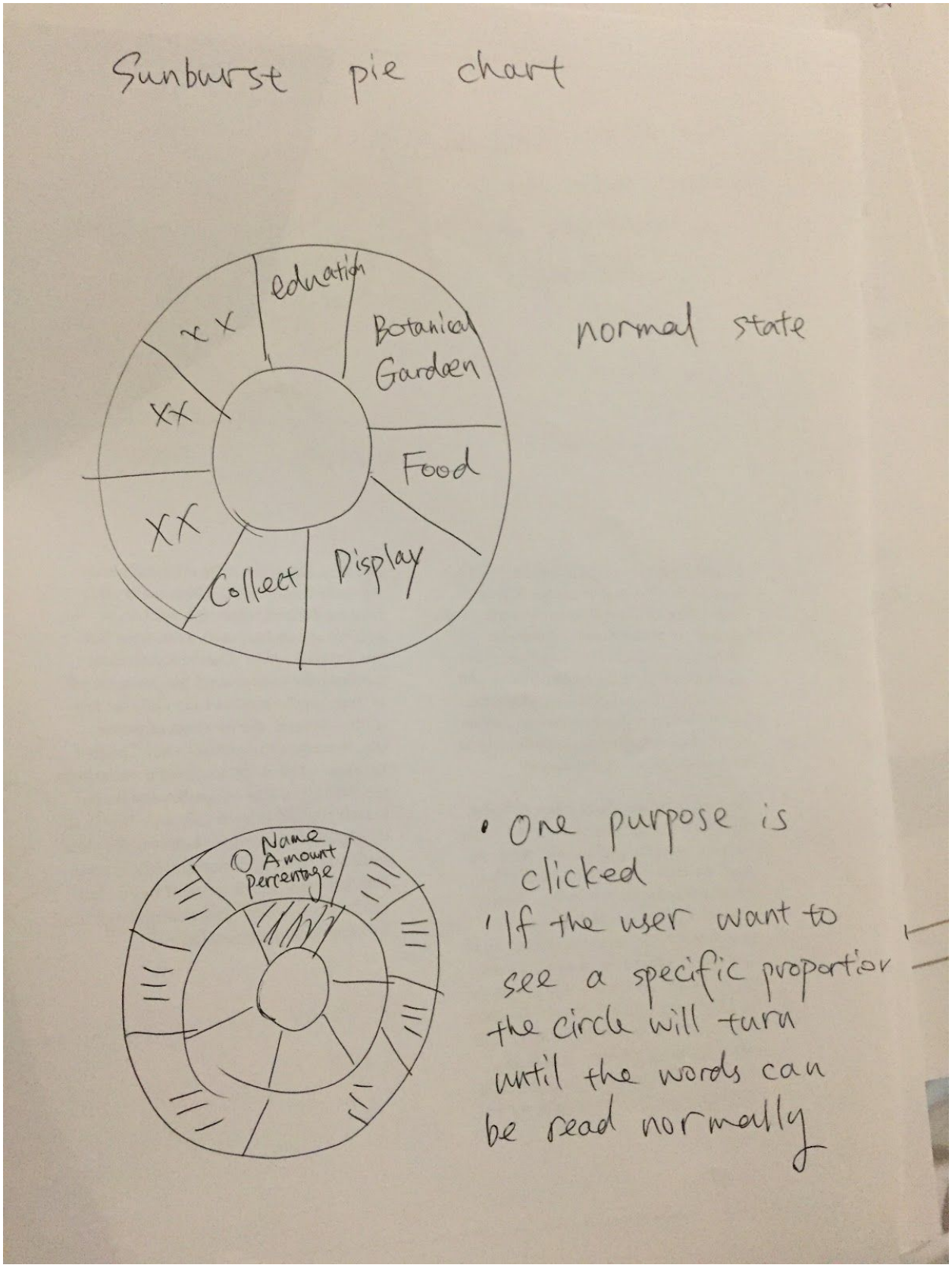
1b. Chord Diagram



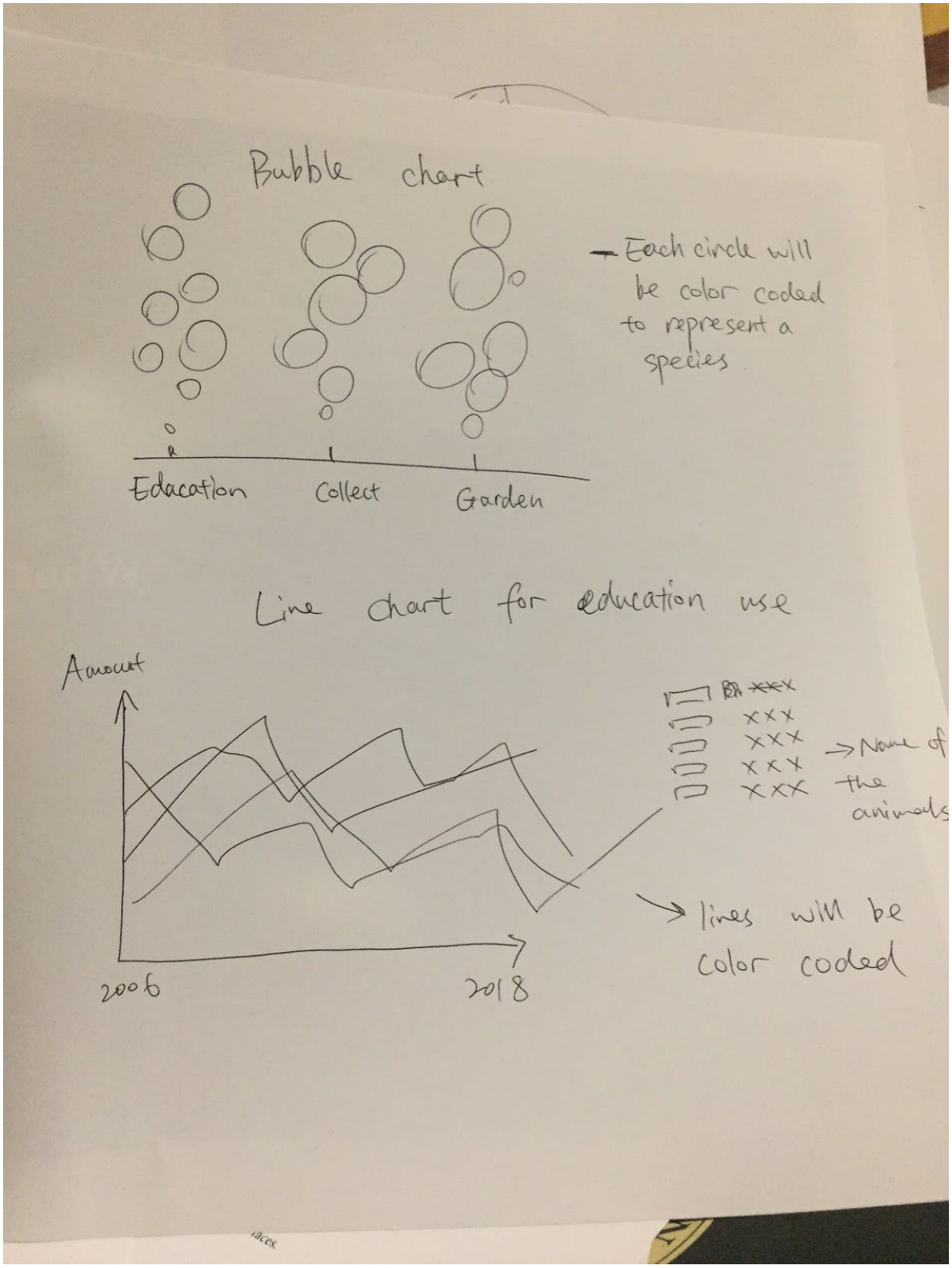
1c. Animated Bar Graph



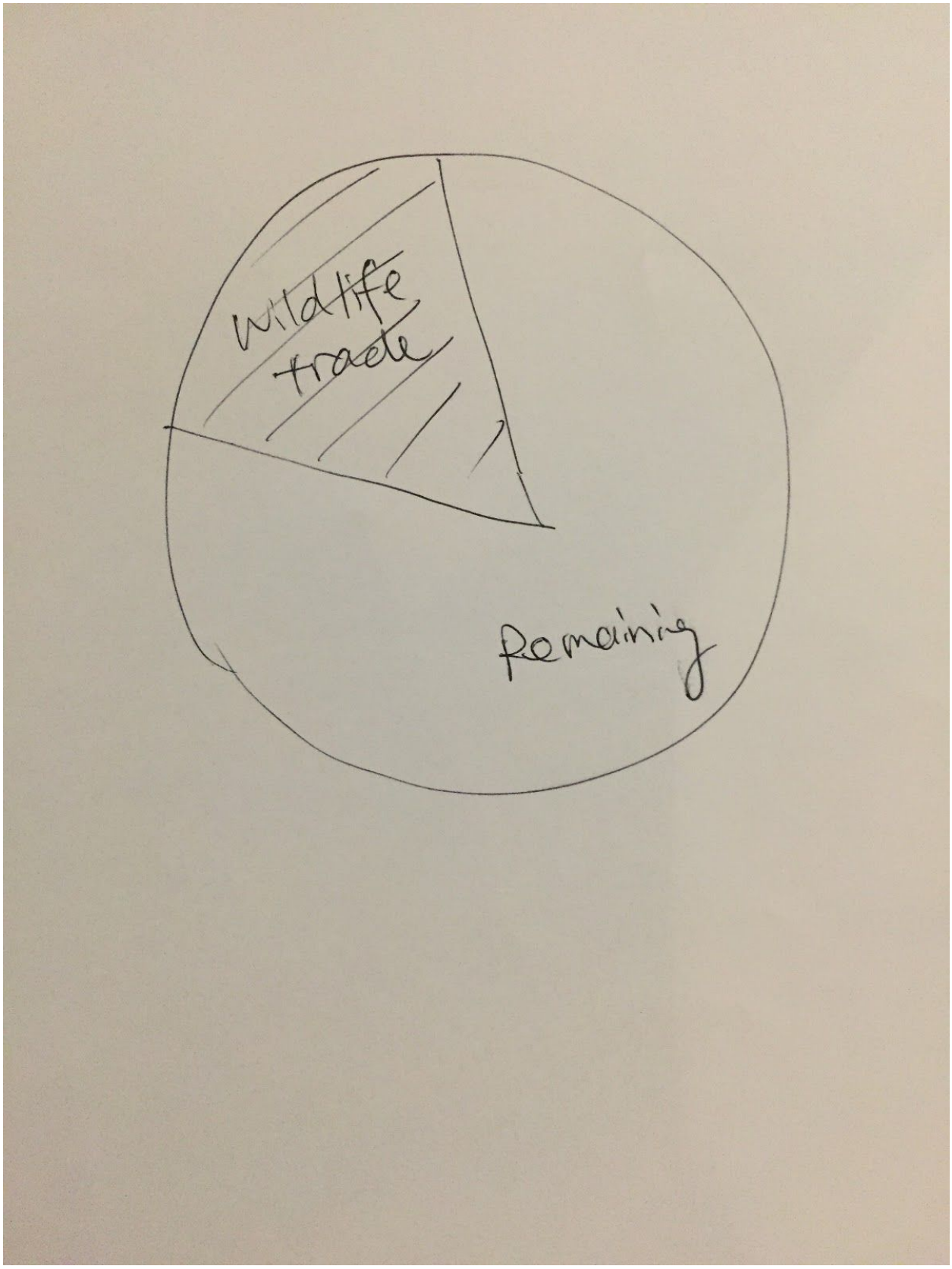
2. Sunburst Pie Chart



2a, b. Bubble Chart & Line Chart



4. Pie Chart



4a. Circle packing