

Hanami Cherry Blossoms Final Report

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Project Goals

Through our project's data visualizations, we hope to inform potential travelers about the experience of cherry blossom viewing, or hanami, in Japan. We hope that through our visualizations, users will be able to learn about the following topics:

- When and where to travel to Japan to view cherry blossoms
- Which countries tend to travel to Japan during cherry blossom season
- What aspects of hanami is significant to Japanese residents

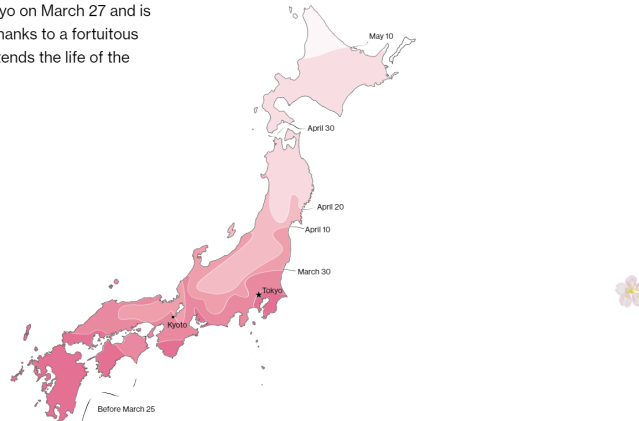
Our website has three sections where we answer the questions above with data visualizations created using d3.js and Tableau. Each section is accompanied by different stages of a blooming cherry blossom branch. Using a color palette associated with cherry blossoms, we hope that the users experience some of the festive atmosphere of cherry blossom viewing.

Alongside these goals, we aim to increase our users' interest in traveling to Japan. Our website was designed to be similar to an informative blog, where we have some recommendations for planning a trip to Japan.

Related Work

- [Chloe Whiteaker, Marika Katanuma and Paul Murray. "The Big Business of Japan's Cherry Blossoms". April 5, 2019](#)

As winter recedes, the rosy wave is making its way up the archipelago. **Full bloom** reached Tokyo on March 27 and is expected to last until at least April 7 thanks to a fortuitous return to cooler temperatures that extends the life of the fragile flowers.



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This article talks about the cherry blossom season in Japan and how many people travel to Japan to see cherry blossoms. It also contains animated choropleths that are similar to what we first thought of creating in our brainstorming stage. We also had the idea of using falling cherry blossom petals on our website, but we found that the moving elements distracted us from viewing our visualizations.

- [LiveJapan. "Must-See Sakura Ranking: Top 100 Cherry Blossom Spots in Japan". December 9, 2019](#)

The screenshot shows the LiveJapan website interface. On the left, there is a navigation menu with categories: Visiting, Eating, Shopping, Lodgings, Area, and How to. Below the menu is a large image of cherry blossoms. To the right of the image is a list of the top 10 cherry blossom spots in Japan (2018):

- #1 Himeji Castle (Hyogo)
- #2 Chidorigafuchi (Tokyo)
- #3 Shinjuku Gyoen National Garden (Tokyo)
- #4 To-ji Temple (Kyoto)
- #5 Shukugawa Park (Hyogo)
- #6 Kenroku-en (Ishikawa)
- #7 Miharu Takizakura (Fukushima)
- #8 Ninna-ji Temple (Kyoto)
- #9 Hitome Senbonzakura (Miyagi)
- #10 Gongendo Tsutsumi (Saitama)

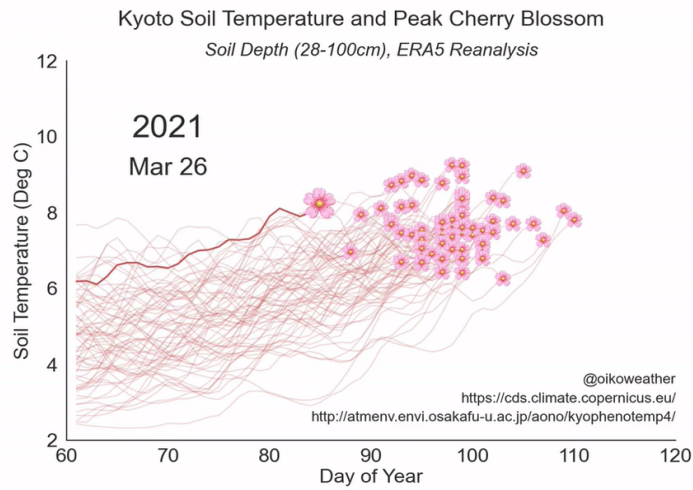
On the right side of the screenshot is a Google map of the Tokyo region, showing several red location pins. Below the map is a list of the top 3 spots from the map:

- Shinjuku Gyoen National Garden (新宿御苑)
- Chidorigafuchi (千鳥ヶ淵緑道)
- Sakuranoyama Park

This article talks about Tripadvisor's top 100 Cherry Blossom Spots. They give a summary of the reviews and highlight the beloved aspects of these sights. The accompanying Google map on the right was an inspiration for our own interactive map.

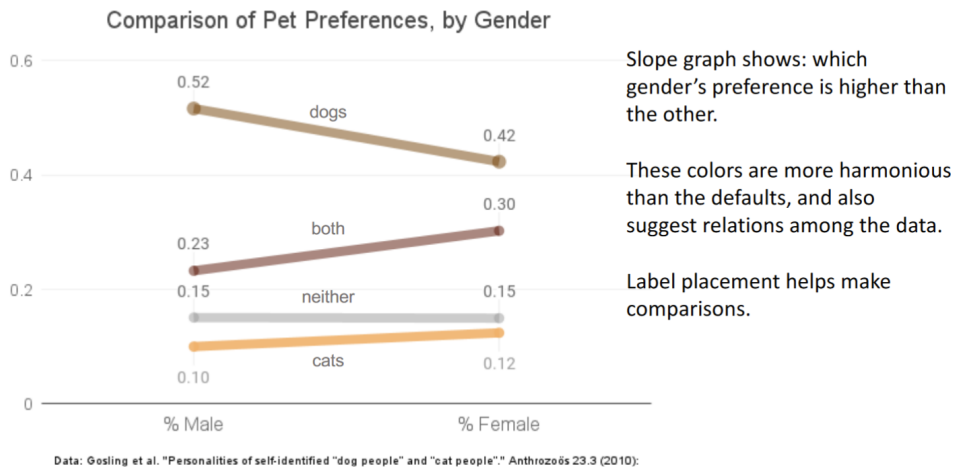
- [u/a_square_peg. “Explaining Peak Cherry Blossom with Warming Soil Temperature”.](#) April 2, 2021.

Posted by u/a_square_peg OC: 21 1 year ago 🏆 🌟 📧
 411 [OC] Explaining Peak Cherry Blossom with Warming Soil Temperature
 oC



This reddit post included an animated line chart where each line was introduced as a bold line and then added to the plot permanently with a faded line. This was an inspiration for the animated line chart on the blooming patterns section.

- [Marti Hearst. “Comparison of Pet Preferences. by Gender”.](#) January 24, 2022.

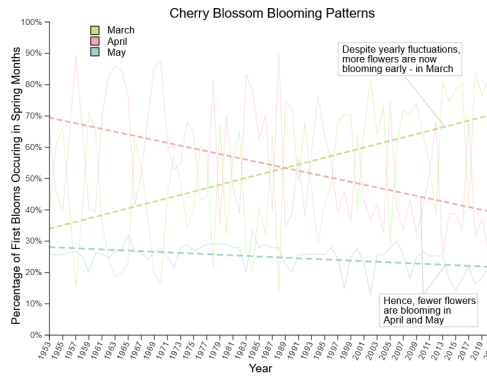
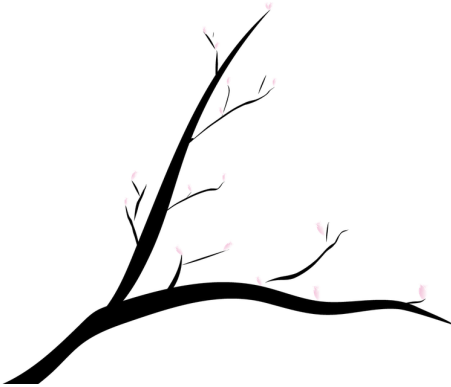


This example shown in class gave us ideas for showing the difference in travel volume by country. Since we had two categories for the x-axis: “Blooming Season” and “Non-Blooming Season”, we were able to use a similar slope graph.

Visualization Description

Blooming Pattern Section

Japan's Pink Flush Blooming Pattern



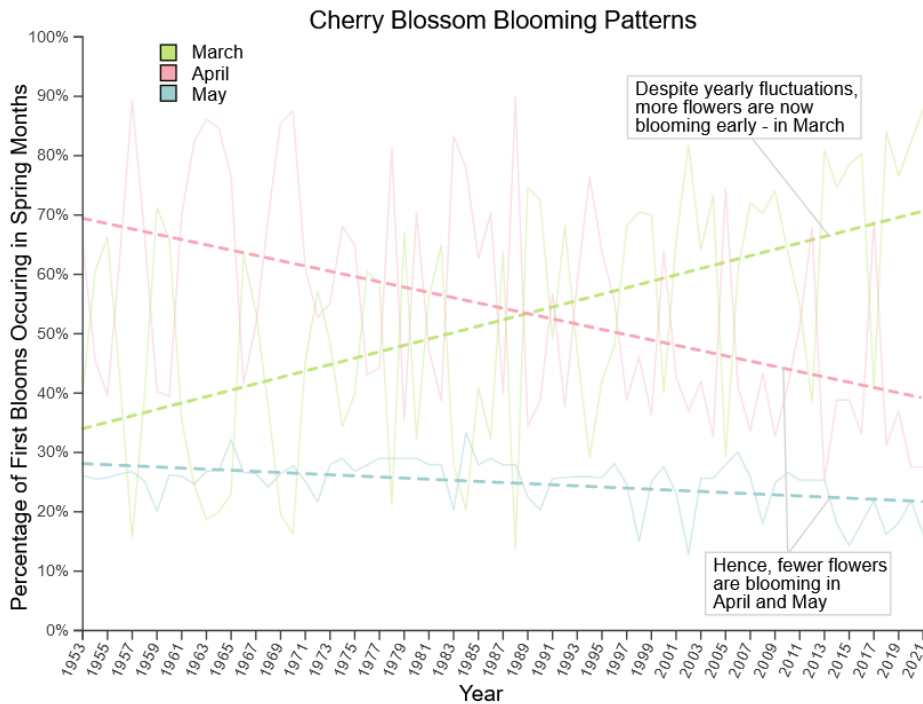
*According to the Japan Meteorology Agency, "first bloom" refers to when observation trees have 5 to 6 flowers that have bloomed and "full bloom" refers to when 80% of the observation tree flowers have bloomed.

When do cherry blossoms bloom in Japan?

Most cherry blossoms in Japan bloom in March, April, or May. Over the years, more and more flowers are blooming earlier in the spring season. For instance, in 2021, 78% of the cherry blossoms observed first

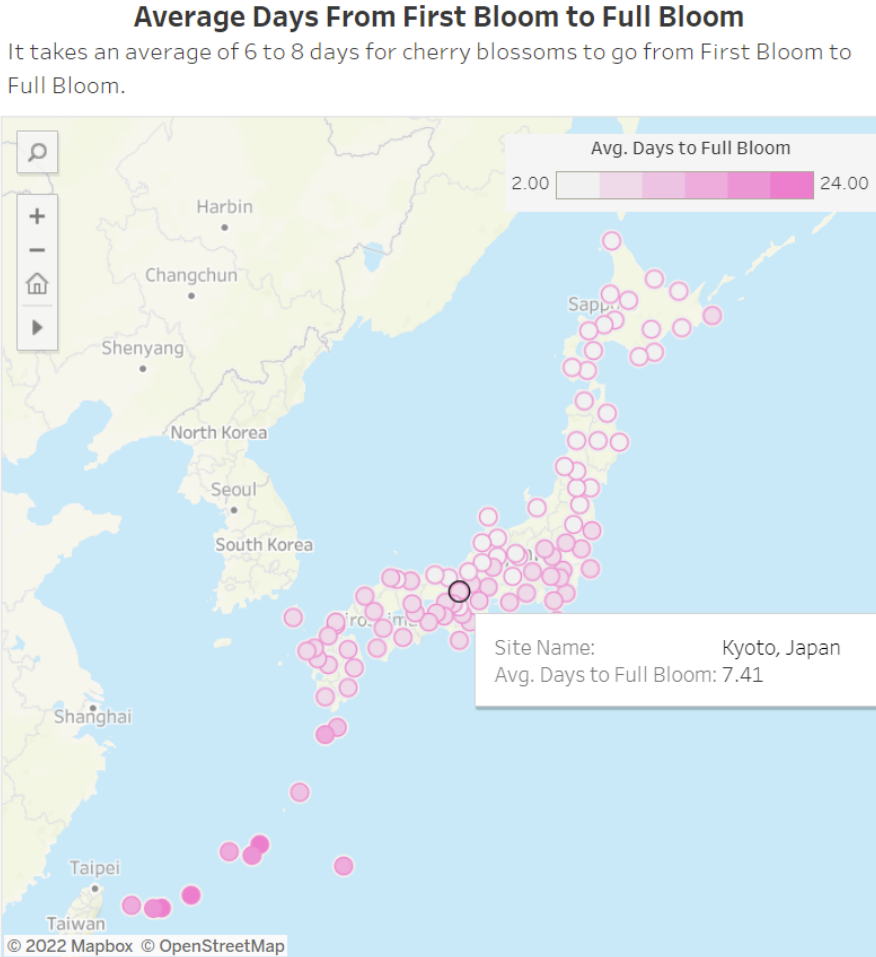
Screenshot of blooming pattern section

In this section, users can learn when cherry blossoms bloom across Japan and how these blooming patterns have changed over time. In addition, users are also given tips on how to choose the best time to visit Japan for cherry blossom viewing.



Screenshot of animated line chart

The visualization above shows cherry blossom blooming patterns over time from 1953 to 2021. The lighter fluctuating lines are the true proportions of cherry blossoms blooming in each month while the bolded dashed lines are the estimated trends (line of best fit) for that month. It is an animated line chart where the green March lines are drawn first, prompting the top text box, then the April and May lines are drawn, finally triggering the final text box on the bottom. With this visualization, users can understand how cherry blossoms are blooming earlier in the spring.



Cherry blossoms in Southern Japan take a longer time to fully bloom on average.

Screenshot of interactive Tableau map with tooltip

The visualization above shows the average time that cherry blossoms take to go from first bloom (a few flowers blooming) to full bloom (80% of flowers on tree bloomed). On the map, users can see darker pink colors in southern Japan and lighter colors further north. Accompanying this visualization is a suggestion for users on when to visit different parts of Japan and how they can stay updated with blooming forecasts.

Tourism Section

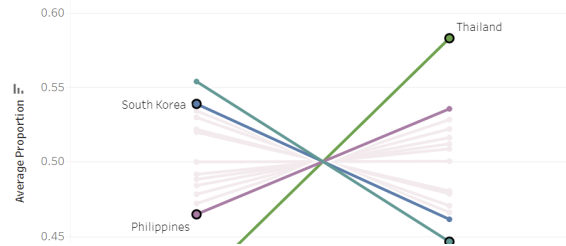
Cherry Blossom Season Tourism in Japan



Which countries visit Japan more during the blooming season compared to the non-blooming season?

Below is a plot featuring the top 15 countries from which Japan receives the most visitors (from Japan tourism data from 1990 - 2022). The lines indicate the average percentages in visitors to Japan between non-blooming season and blooming season. Since the blooming season accounts for only 3 months out of the year, and the non-blooming the other 9, the average visitors for each category are scaled down by 1/3 and 1/9, respectively. Then, a percentage is calculated to account for the difference in populations between these countries to illustrate the difference in travel tendencies for visitors to Japan from these countries.

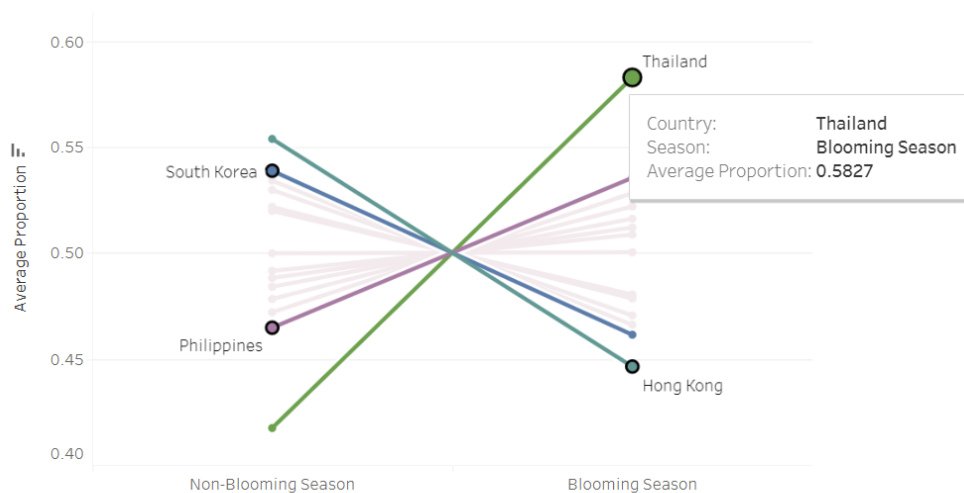
Countries with Most Visitors to Japan
Visitor Average of Non-blooming Season vs Blooming Season



Screenshot of tourism section

In this section, users can learn about Japan tourism in terms of travel during the blooming and non-blooming season. Specifically, they can learn about the tourism frequency of countries to Japan as it relates to the blooming season and non-blooming season. The data come from yearly tourism statistics provided by the Japanese government.

Countries with Most Visitors to Japan
Visitor Average of Non-blooming Season vs Blooming Season



Screenshot of tourism slope plot

Inspired by the slope plots shown in class, this slope plot intends to show the difference in travel volume by country during the blooming and non-blooming season. The top 15 countries from which Japan receives the most visitors were included in this plot, and the top 4 countries

with the greatest positive and negative slopes were highlighted. By hovering over the lines, the tooltips will let users explore the non-highlighted countries as well.

Tripadvisor Reviews Section

What They Talk About When They Talk About Cherry Blossoms

Hover your cursor over the words below to explore!



Cherry blossoms, or sakura, have always been in a significant position in Japanese culture, which symbolizes birth and death, beauty and violence.

In order to better understand the meaning and significance of the experience of cherry blossom viewing (hanami) in Japanese culture, we collected a tremendous amount of reviews from [Tripadvisor](#), and found the most frequently used vocabulary, which we believe indicates what they care about the most when it comes to hanami. Here are some of our findings.

Attention to Location/Environment

From the list of the most frequently used words, we can see a lot of words that are used to specify the location, such as “名所 (famous place)”, “寺 (shrine/temple)”, “公園 (park)”, and the names of cities. It’s not hard to infer that the location where the activity takes place is the core of the experience. Even if it means they have to squeeze in with all the other hanami goers in an outrageously crowded place, they would still value the experience of hanami at a popular spot.

Most Frequent Words in Tripadvisor Reviews by POS

POS	Word	Translation	Count
n.	名所	famous place	201
	満開	full bloom	149
	公園	park	96
	寺	shrine	70
	都会	urban	61
v.	行く	go	44

Screenshot of Tripadvisor section

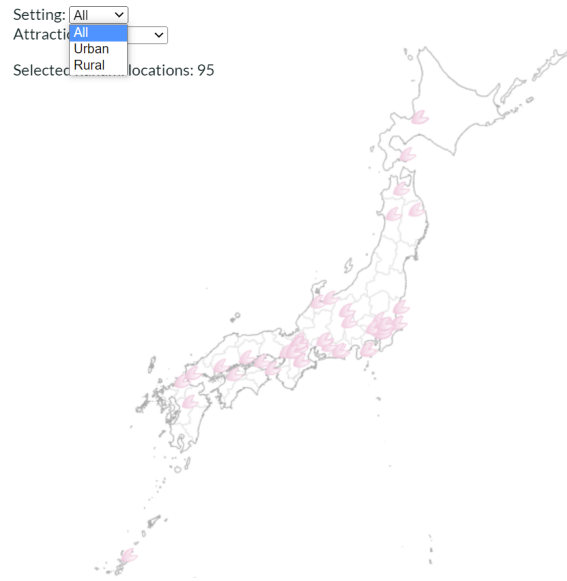
In this section, users can learn more about what aspects of cherry blossom viewing is important to Japanese residents. By analyzing Tripadvisor reviews and visualizing the analysis results, users are able to get an insight into which parts of cherry blossom viewing are most mentioned in Japanese Tripadvisor reviews.

Most Frequent Words in Tripadvisor Reviews by POS

POS	Word	Translation	Count
n.	名所	famous place	201
	満開	full bloom	149
	公園	park	96
	寺	shrine	70
	都会	urban	61
v.	行く	go	44
	見る	look	26
	楽しむ	enjoy	26
	咲く	bloom	17
	並ぶ	line up	17
adj.	綺麗	pretty	44
	広大	vast	44
	素晴らしい	amazing	35
	静か	silent	26
	良い	good	26

Screenshot of word frequency bar plot

Through the visualization above, users can get a sense of what aspects of cherry blossom viewing Japanese reviewers tend to mention the most. In particular, we draw attention to the fact that there are many words that refer to the location and environment of the cherry blossom viewing site.



Screenshot of cherry blossom viewing (hanami) sites with Setting dropdown menu

The visualization above uses dropdown menus to allow users to filter for different settings (Urban/Rural) and attractions (Shrine/Castle/Garden/Park/Water). This encourages users to explore the different cherry blossom viewing locations in Japan.

Hover your cursor over the words below to explore!



Screenshot of word interactive tree text

The interactive tree text above swivels, changes to bold stroke, and reveals a tooltip as you hover over each Japanese term. This is another interactive and animated way for users to

engage with our website. It is an alternative visualization of the data shown in the bar plot above. Additionally, the font sizes correspond to the frequency as in common word clouds. With interactivity, this visualization can also be seen as an experiment to explore how to make word clouds more comprehensible as a form of text visualization.

Reference codes:

- The animated line chart animation was made possible with code from [Louise Moxy](#) and [visualCinnamon](#)
- The location filter from [Italy Gas Station Distribution](#)
- The scrolly-telling feature from [Simplified Scrollama Scrollytelling](#).



Screenshot of selected review quote

The selected review above is shown at the end of the website. It is selected from the Tripadvisor reviews to provide context to the words shown in the previous visualizations. With handwritten calligraphy and cherry blossoms on the left side, this visualization resembles the traditional layout of Japanese haiku as an attempt to bring a cultural aspect of this topic to our audience.



Combined screenshots of sidebar blooming branch

As you scroll through each section of our website, there will be four versions of a cherry blossom branch displayed on the left side of the screen. First is a branch with flower buds, second is the same branch with flower buds and a few bloomed flowers, third is the branch with interactive text, and the final branch is with fully bloomed flowers with a sun that resembles the flag of Japan. This visualization simulates the blooming process of a cherry blossom branch, and helps tie each section of our website together as a graphic theme.

Approach

Data

The following sources of data were used for our visualizations:

- Cherry Blossom (Sakura) Bloom Dates from 1953 to 2020
 - [Kaggle](#)
 - [GitHub](#)
- [Japan Tourism Data \(Japan National Tourism Organization\)](#)
- [2022 Japan Cherry Blossom Forecast Data \(Japan Rail Pass\)](#)
- Data scraping of cherry blossom reviews via the Tripadvisor API

Tools

The following tools were used for our project:

- Data Collection and Cleaning: R, Python
- Visualization: Figma, d3.js, Tableau
- Other: Google Slides, Github

User Testing and Results

Overview

The usability study was an integral part of our project. It allowed us to receive feedback from people of various backgrounds and experiences on our visualizations. Through this study, we were able to consider important critiques from which we could build improvements.

Test Setup

In order to test our visualizations, we asked 9 participants to partake in our usability study. Participants were college students aged 20-24, some of whom have traveled to Japan before and some who haven't. We assessed the effectiveness of our visualizations by asking participants a series of questions before and after interacting with the visualizations. We also documented their thoughts as they interacted with the visualizations. The questions were asked as follows:

1. Rate your current interest in traveling to Japan. (Rate from 1-10)
2. Rate your interest in cherry blossoms in Japan. (Rate from 1-10)
3. What do Japanese people care about when it comes to hanami?
4. When is the best time to view cherry blossoms in full bloom in Japan (for tourist-heavy/popular cities – Tokyo, Kyoto, Osaka)?
5. Visitors from which countries are more likely to visit Japan during the blooming season?

The above set of questions was asked before and after each participant interacted with the visualizations. Additionally, we asked participants to share what they thought was confusing about the visualizations, what they thought could be improved about the visualizations, and their general thoughts on the visualizations as a whole.

Results

ID	Rate your current interest in traveling to Japan. (1-10) - PRE	Rate your interest in cherry blossoms in Japan. (1-10) - PRE	Rate your current interest in traveling to Japan. (1-10) - POST	Rate your interest in cherry blossoms in Japan. (1-10) - POST	Interest in traveling to Japan difference	Interest in cherry blossoms in Japan difference
1	7	9	7	9	+0	+0
2	5	2	7	9	+2	+7
3	5	2	8	7	+3	+5
4	7	6	8	9	+1	+3
5	9	7	10	6	+1	-1
6	5	7	5	7.5	+0	+0.5
7	10	10	10	10	+0	+0
8	7	3	7	3	+0	+0
9	8.5	9	8.5	9	+0	+0
Avg	7.055	6.11	7.833	7.72	+0.66	+1.61

For the quantitative questions, we recorded the results above. Overall, we see that participants on average show an increased interest in traveling to Japan and interest in cherry blossoms after interacting with our visualizations.

Overall Impression and Usability of Visualization

Generally, the impression that our visualizations had on the participants of our usability study is that while they enjoyed the aesthetic cohesion of our separate visualization, they found some to be not very interpretable. For instance, those not of a STEM background found it difficult to ascertain the meaning of the slope lines in the blossom forecast plot as well as the percent difference bar chart of the countries. Additionally, some of the axis interaction (sorting) was not a feature that some users were aware of.

In order to improve our visualizations, we decided to overhaul the tourism percent difference bar graph into a slope plot in order to show the difference between blooming season tourism and non-blooming season tourism for each country. We also decided to add annotations to the blooming forecast line plot for clarification.

Link to Code and Visualization

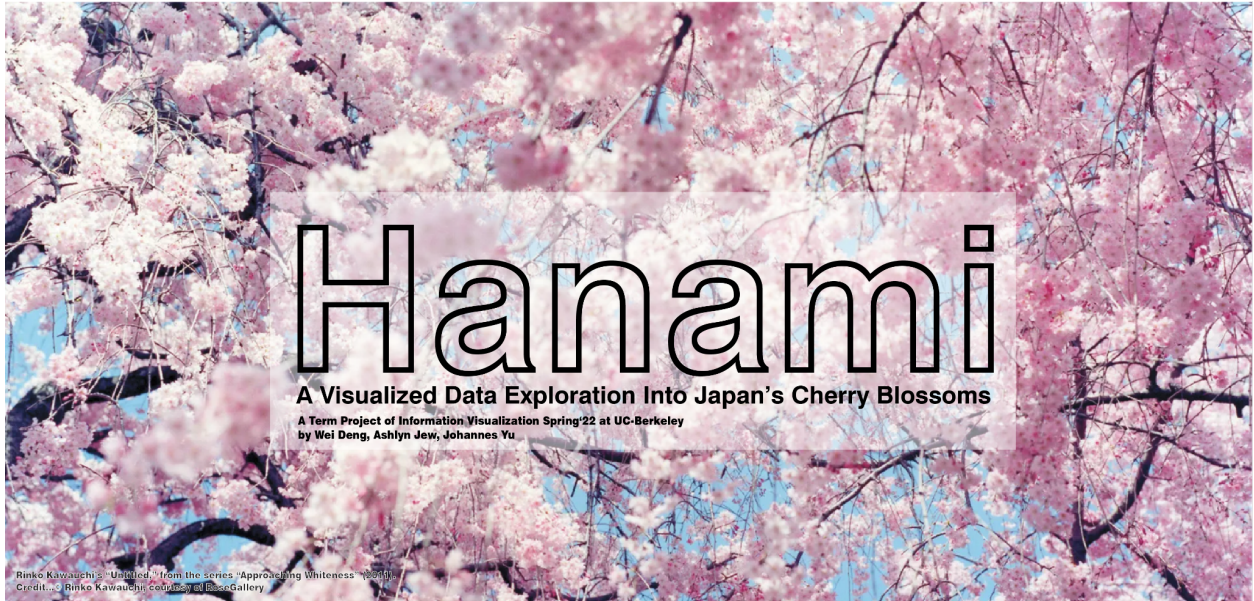
- Website (visualizations): <https://asjew.github.io/blossoms/>
- Github repository (all code and data): <https://github.com/asjew/blossoms>
- [Link to video demo of website](#)

Team Contributions Breakdown

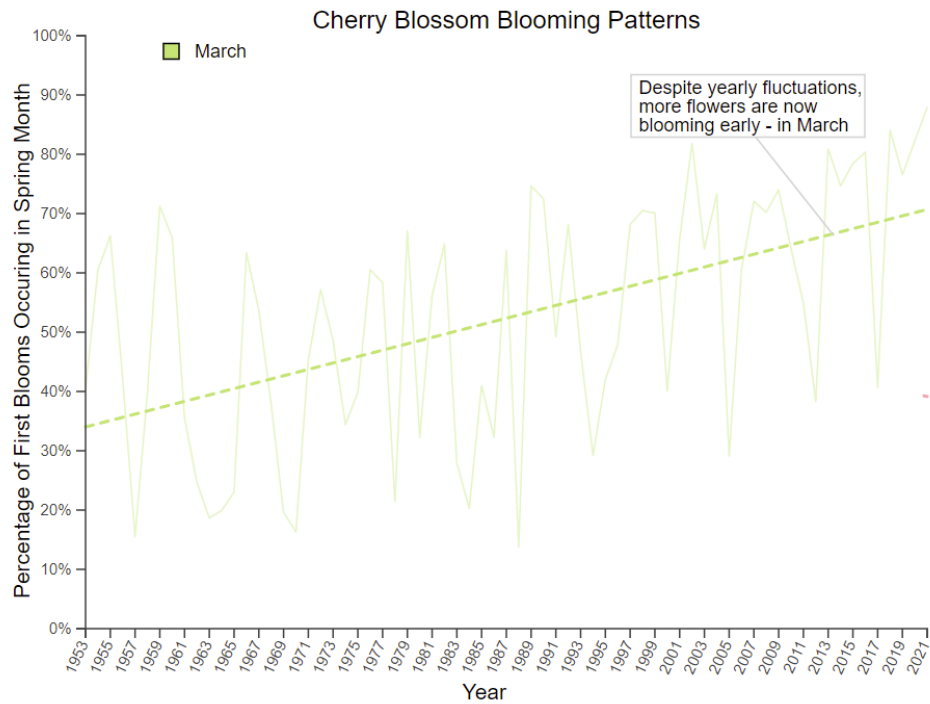
Phase	Task	Ashlyn Jew	Wei Deng	Johannes Yu
EDA	Data Collection	33%	33%	33%
	Data Cleaning	33%	33%	33%
	Initial Visualizations	33%	33%	33%
Mid-Project Presentation	Slides	33%	33%	33%
	Presentation	33%	33%	33%
Usability Study	Study Design	33%	33%	33%
	Conducting Study	33%	33%	33%
	Analysis	33%	33%	33%
	Writeup	33%	33%	33%
Website Visualizations	First Bloom Line	100%	0%	0%
	First Bloom Map	100%	0%	0%
	Tourism Slope Plot	0%	100%	0%
	Word Frequency	0%	0%	100%
	Petal Map	0%	0%	100%
	Additional Visuals	40%	10%	50%
	Final Construction	17%	5%	77%
Final Writeup	Content	47%	47%	5%
Other Contributions	Team Meetings	33%	33%	33%
	Github Maintenance	33%	33%	33%

Appendix

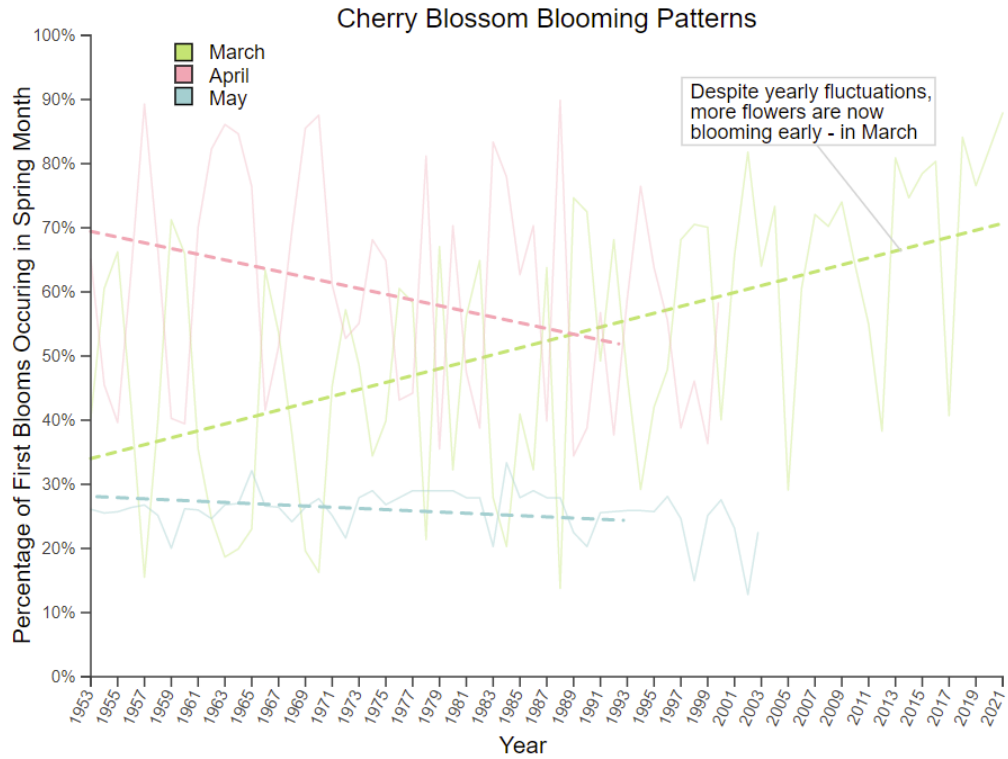
Detailed Data Visualization Screenshots



Screenshot of introduction section



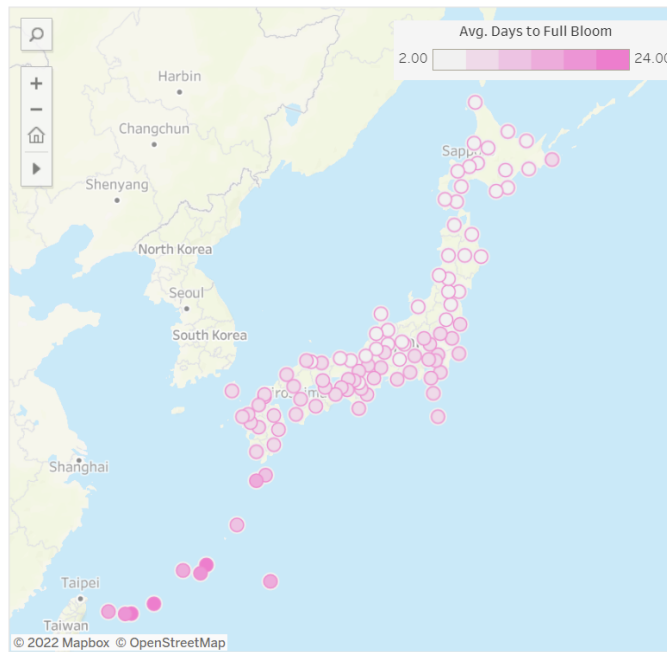
Screenshot of animated line chart frame where the March lines are drawn, but the April and May lines have not been drawn yet.



Screenshot of animated line chart where April and May lines are being drawn.

Average Days From First Bloom to Full Bloom

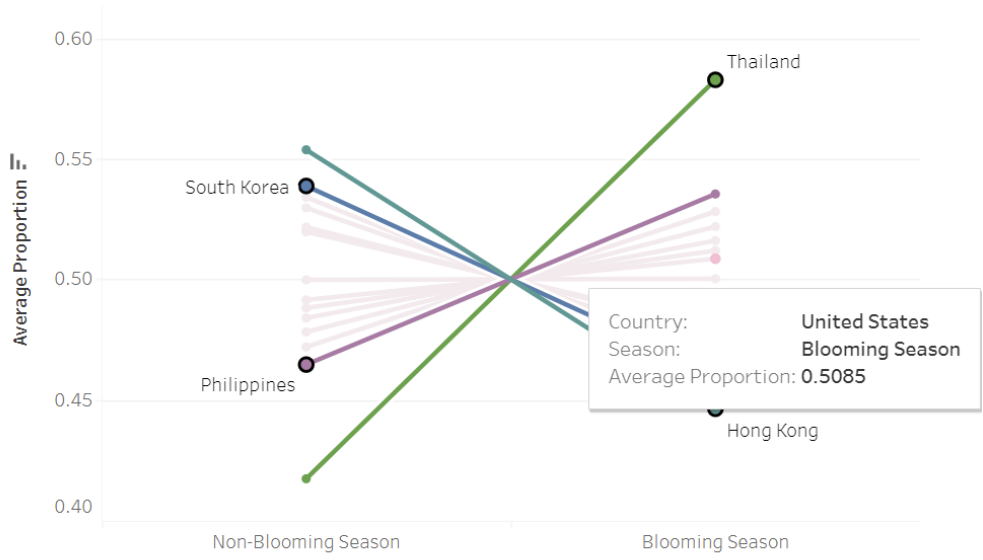
It takes an average of 6 to 8 days for cherry blossoms to go from First Bloom to Full Bloom.



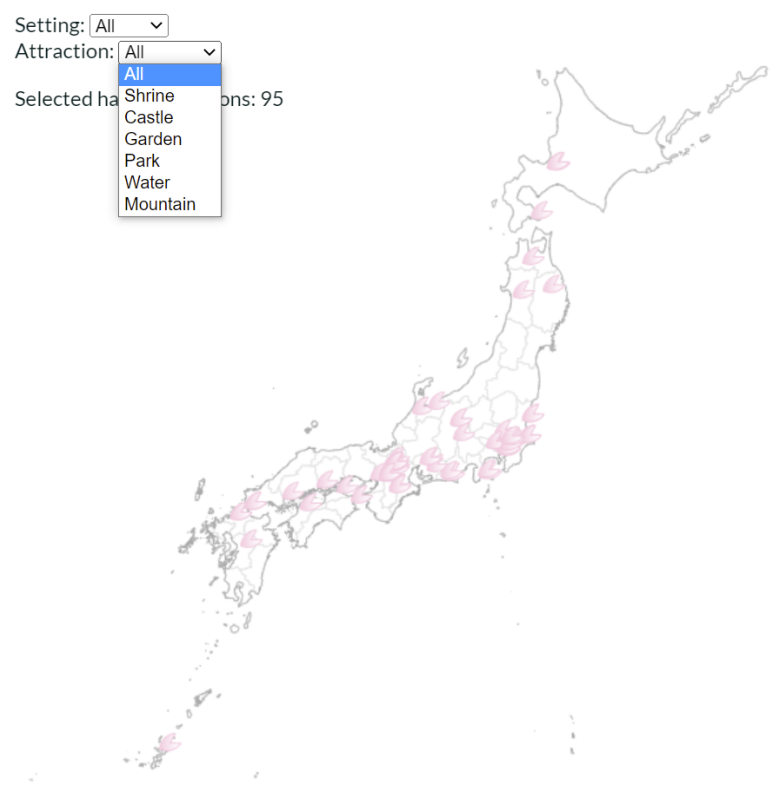
Cherry blossoms in Southern Japan take a longer time to fully bloom on average.

Screenshot of interactive Tableau map without tooltip

Countries with Most Visitors to Japan
 Visitor Average of Non-blooming Season vs Blooming Season



Screenshot of tourism slope plot with tooltip for non-highlighted county



Screenshot of cherry blossom viewing (hanami) sites with Attraction dropdown menu

都会の喧騒を
忘れてきたり。

The hustle and bustle of the city is forgotten.

Screenshot of Tripadvisor review quote