



Forecasting Japan's Cherry Blossom Dates

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FUN FACT

Cherry Blossoms in Japan
typically only last around 10-14
days.



TARGET AUDIENCE #1 -

Mr Yashida Noboru



Ryokan (Traditional Inn Owner) in Kyoto



Wants to attract more tourists during Cherry Blossom season with special packages



Challenge #1: Faces difficulty in planning promotions due to variability in bloom dates

TARGET AUDIENCE #1 - Mr Yashida Noboru



Challenge #2: Not enough bookings during cherry blossom season



Needs: Reliable forecast for marketing and logistics

TARGET AUDIENCE #2 -

Mdm Misaki Chiyu



Local Souvenir Shop
Owner in Kochi - Local
alcohol and snacks



Wants to maximize foot
traffic during cherry
blossom season



Wants to ensure new
inventory is enough for
the season

TARGET AUDIENCE #2 -

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Challenge #1: Inventory obsolescence due to poor business



Challenge #2: Missed sales opportunities due to inaccurate promotion timing



Needs: Reliable forecast so that she can estimate when tourists will flock to the region

TARGET AUDIENCE # 3 -

Mr Takai Tsukasa



Local Restaurant Chef
Owner – Izakaya in
Fukuoka



Wants to create seasonal
menus to attract
customers



Wants to capitalize on
the increase in foot traffic
during the season

TARGET AUDIENCE #3 -

Mr Takai Tsukasa



Challenge #1: Timing seasonal menus can be tricky if bloom dates are uncertain



Challenge #2: Short bloom periods limit the marketing window



Needs: Early forecasts to plan ingredient procurement and marketing



Problem Statement



**“ How can we help local businesses to
maximize their success during the
cherry blossom period? ”**





Primary Goal



Develop a reliable prediction model for
Cherry Blossom Dates in 2024 & 2025.



Analysis done

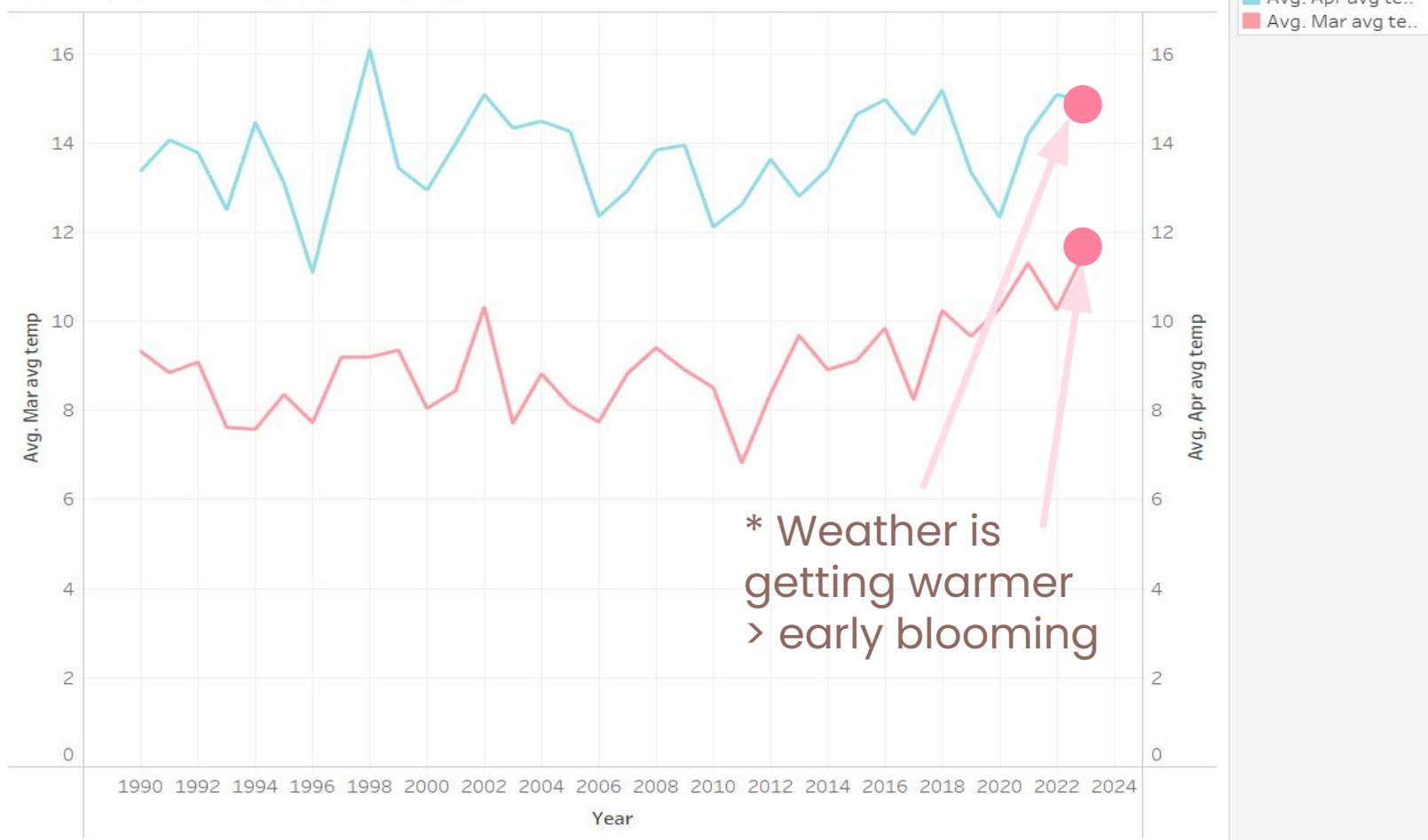
Terms and what they mean

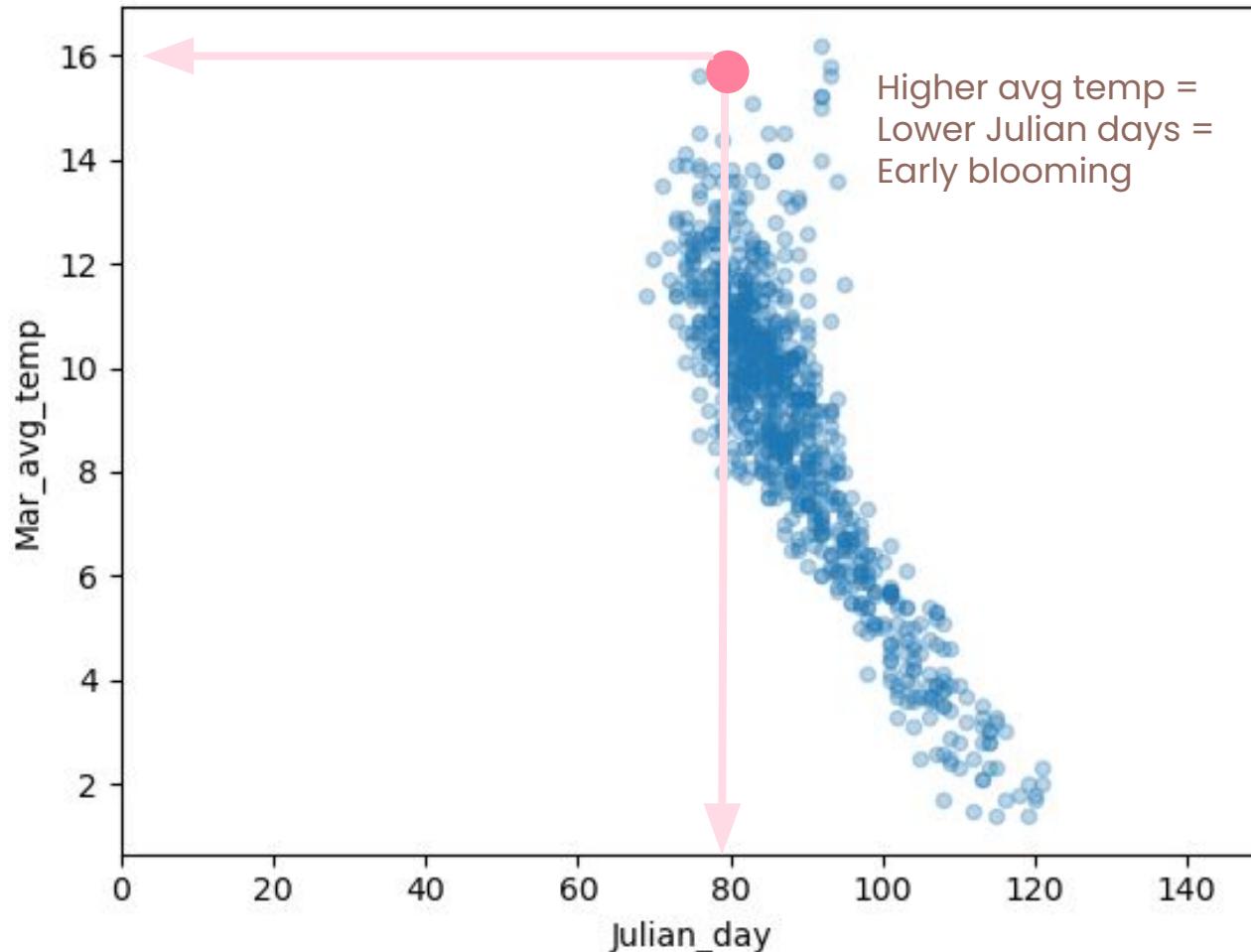
Julian days -> Continuous count of days from the beginning of the year (365 days)

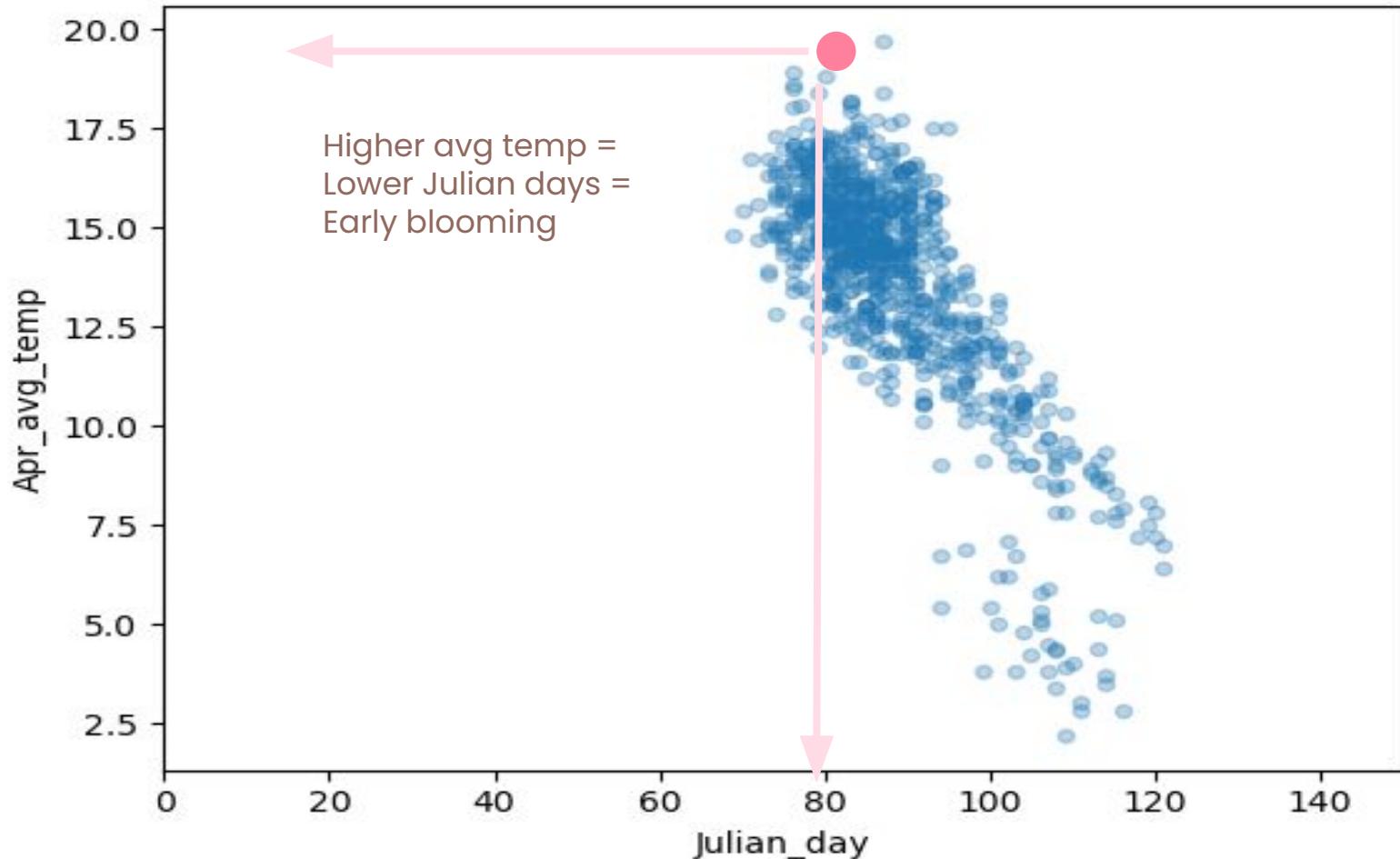
Average Bloom Dates (Julian days) by Year - 2023

Aomori 97	Kagoshima 83	Okayama 81	Saga 81	Toyama 81	Nagasaki 80
Akita 94	Oita 83				
		Nara 79	Shizuoka 78	Tottori 78	Fukuoka 77
Yamagata 90	Tokushima 82	Wakayama 79			
Niigata 86	Fukui 81	Hiroshima 78	Kochi 76	Gifu 75	
Fukushima 83	Kumamoto 81	Osaka 78	Kyoto 76	Tokyo 73	

Temperature trends over the years

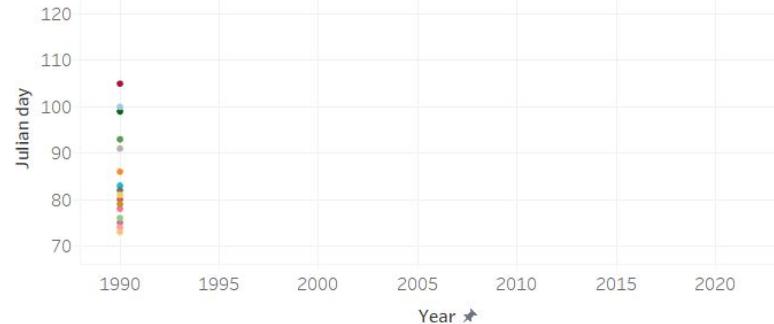






Interactive Dashboard - For analyzing historical bloom trends

Historical Bloom Trends by cities over time - 1990



Average Bloom Dates (Julian days) by Year - 1990

Aomori 105	Toyama 91		Kyoto 80	Osaka 80	
Akita 100	Fukui 86		Hiroshima 79	Gifu 76	Saga 76
Yamagata 99	Tottori 83		Shizuoka 79		
Fukushima 93	Nara 82		Tokyo 79	Oita 75	
Niigata 91	Okayama 82		Wakayama 78	Nagasaki 74	

Year
1990

Q

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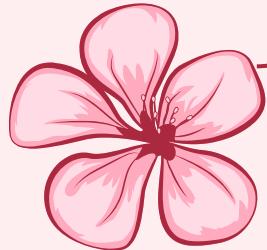
Show history

- Region
- Akita
 - Aomori
 - Fukui
 - Fukuoka
 - Fukushima
 - Gifu
 - Hiroshima
 - Kagoshima
 - Kochi
 - Kumamoto
 - Kyoto
 - Nagasaki
 - Nara
 - Niigata
 - Oita
 - Okayama
 - Osaka
 - Saga
 - Shizuoka
 - Tokushima
 - Tokyo
 - Tottori
 - Toyama
 - Wakayama
 - Yamagata

ARIMAX Time Series Model - How did we do it?

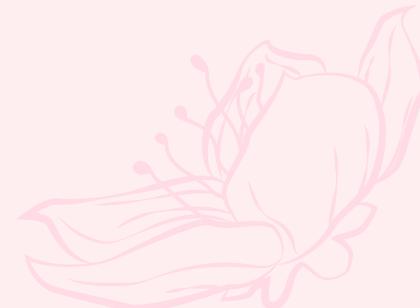
Train

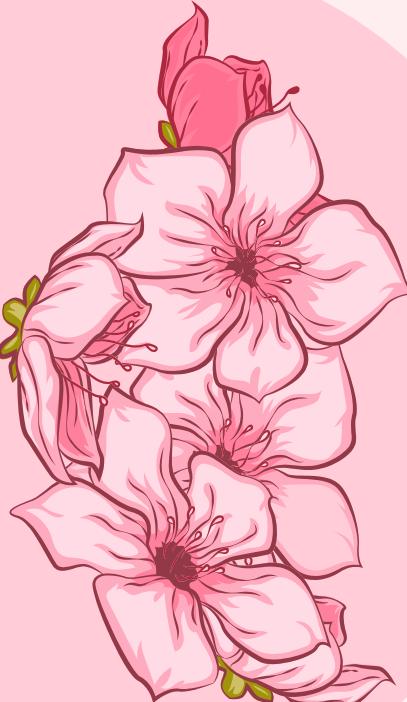
Model is trained using historical bloom dates from 1990–2023 and monthly average air temperature data



Test

Trained Model is tested using 2024 monthly average air temperature data





What did we do?

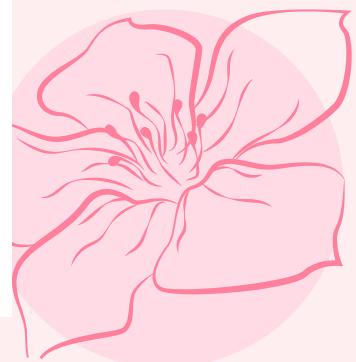
- Test our model to predict 2024's bloom date across 25 regions
- Test our model on unseen data to predict 2025's bloom date across 25 regions

HERE'S WHERE THE PINK BLOSSOM HAPPENS

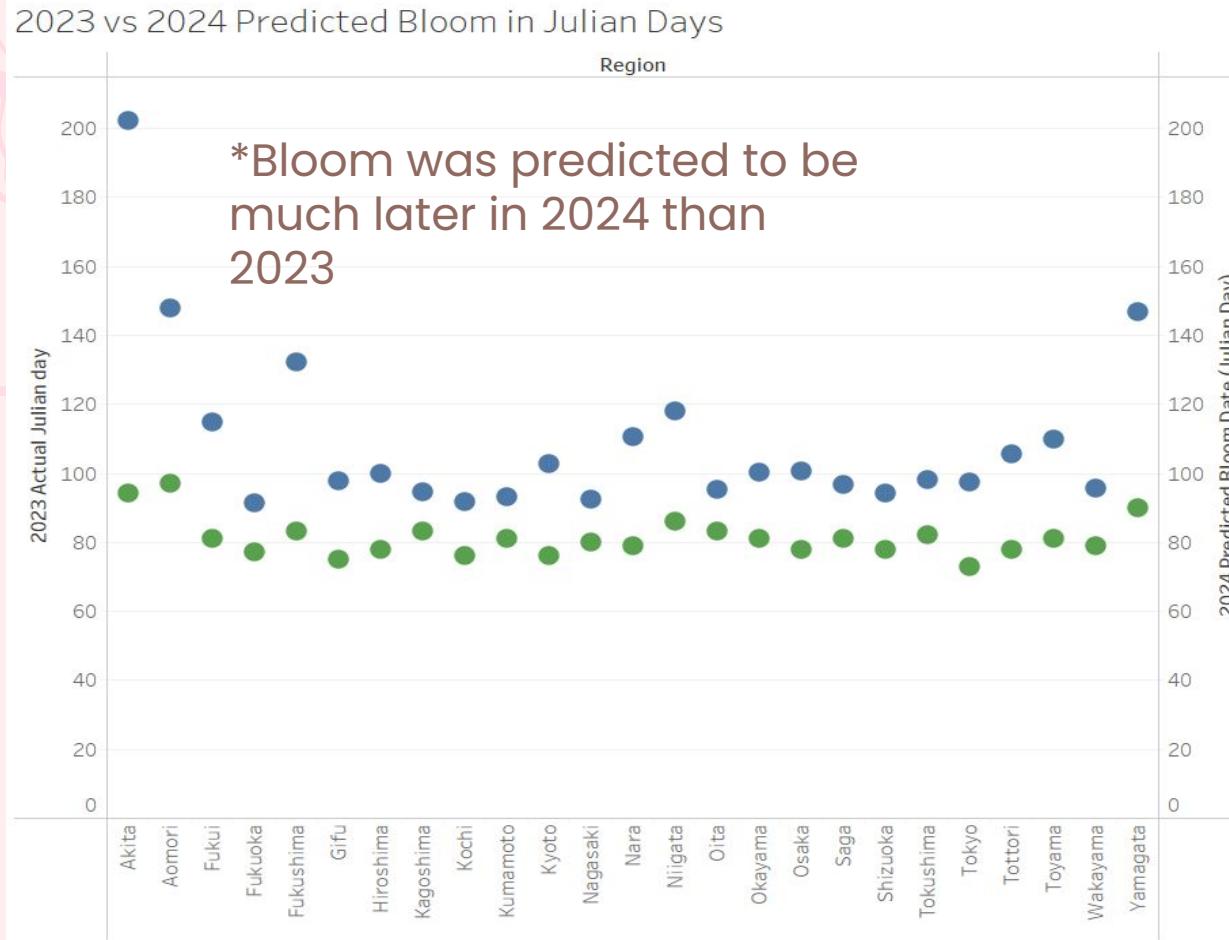


- Late Bloomings often happen in the north
- Early Bloomings often happen in the south

2024 & 2025 Predicted Bloom Dates across



2023 Actual vs 2024 Predicted Bloom Dates across cities



2023 Actual vs 2024 Predicted Bloom Dates across cities

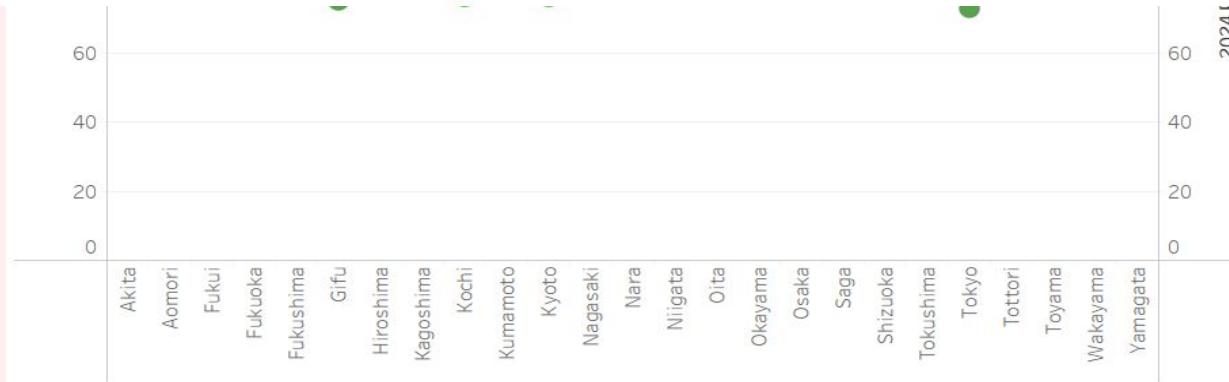
2023 vs 2024 Predicted Bloom in Julian Days



*Bloom was predicted to be
much later in 2024 than
2023

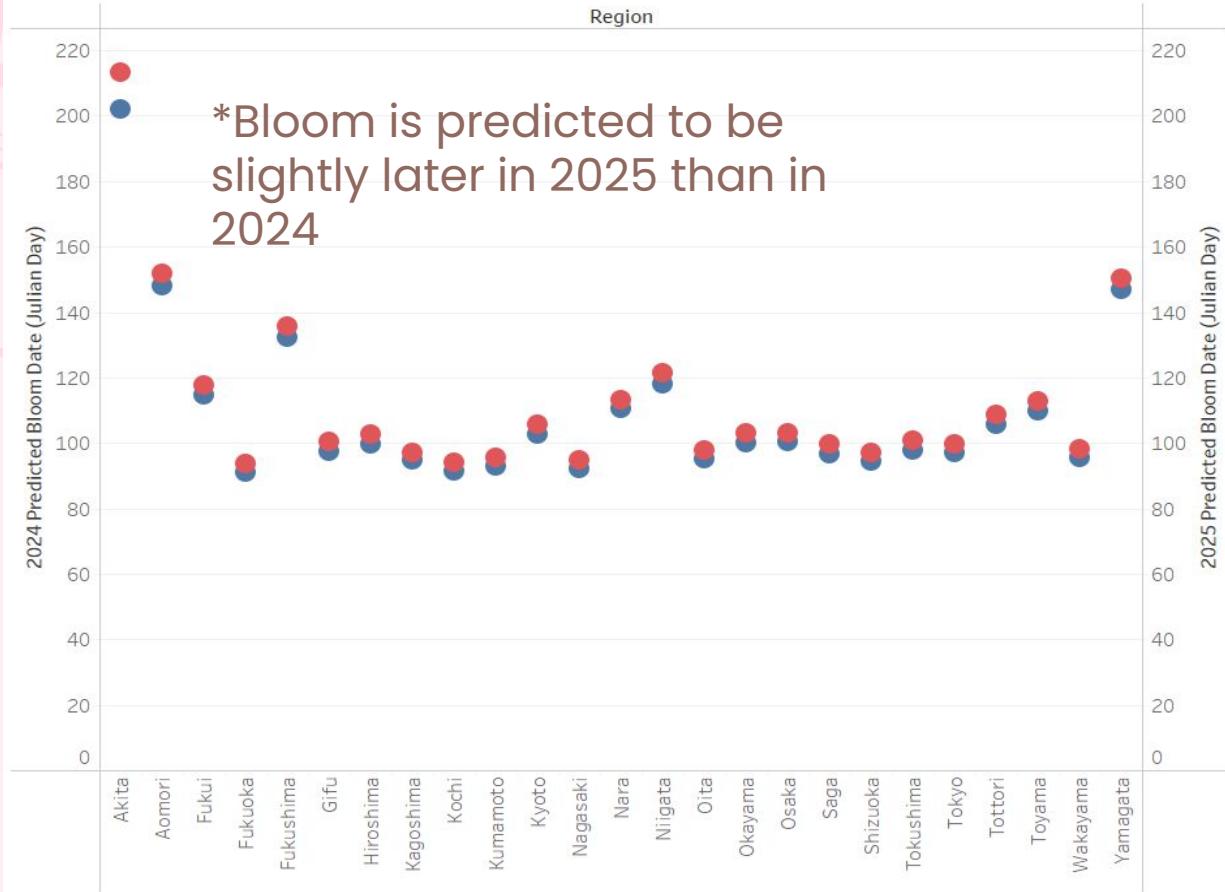
JAPAN / SOCIETY

Cherry blossoms bloom in Tokyo, 15 days later than last year



2024 vs 2025 Predicted Bloom Dates across cities

2024 vs 2025 Predicted Bloom in Julian Days



SUCCESS METRICS



Forecasted date
± 3 days of
actual blooming
date

01

02

Being able to
predict the dates
across all/some
regions



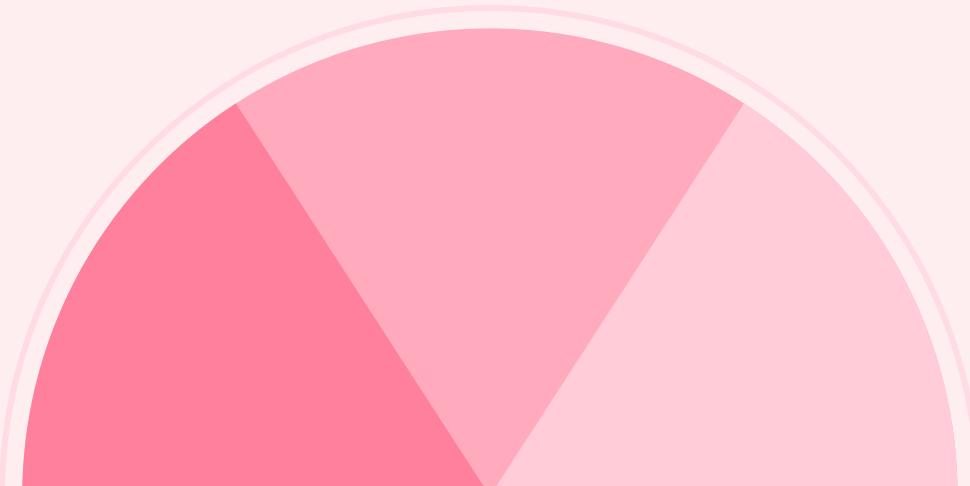
03



Test the model's
accuracy on
unseen data
(2025)



**UNFORTUNATELY, OUR RESULTS WERE NOT
ACCURATE IN TERMS OF THE ACTUAL DAY,
 \pm 16 DAYS**



THIS IS WHY: OUR LIMITATIONS

Temperature variability

Only monthly average temperature was available online for use instead of daily

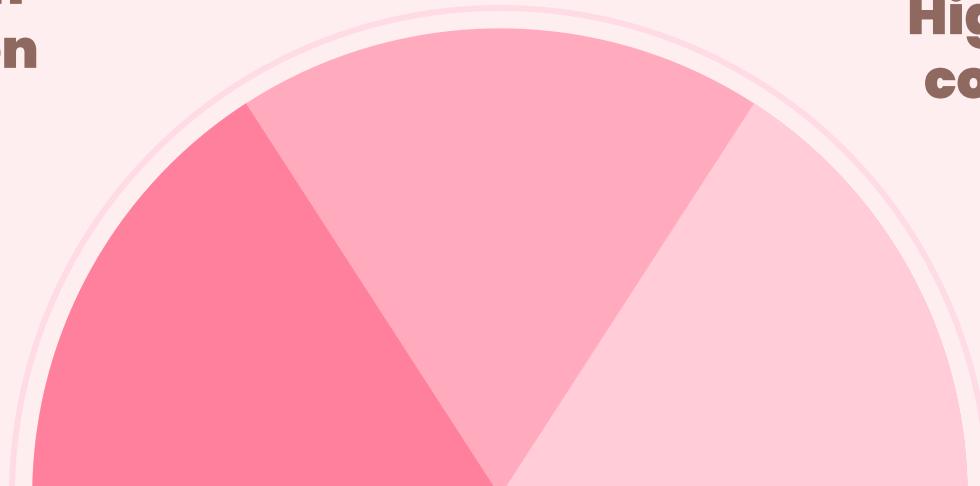
Short sighted

We only analyzed the weather in March and April

Model Limitations

Models often rely on simplified assumptions, which does not capture the full complexity of biological and climatic interactions

WHAT DID WE DO RIGHT: OUR STRENGTH



Clear
problem
definition

Critical
thinking
about results

Highlighting
complexity

What can we do to improve prediction accuracy?



Better data collection

Collecting high-resolution, long-term datasets on temperature, precipitation and bloom dates across multiple regions



Advanced modeling

Using other machine learning models like Random Forest could capture non-linear and complex interactions

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Challenge #2: Not enough bookings during cherry blossom season



Needs: Reliable forecast for marketing and logistics

Our recommendations

#1

Address bloom variability



A

Plan promotions with flexibility, offering “cherry blossom week” packages



B

Highlight the full cherry blossom experience in his packages, not just peak bloom

Our recommendations

#2

Increase bookings

A

Encourage early bookings by offering early bird discounts

B

Provide additional perks for weekday stays such as free breakfast

Our recommendations

#3 Marketing strategies

A

Partner with regional cherry blossom festivals to cross-promote his services

B

Leverage social media to post real-time updates about the blossoms near his inn

Our recommendations

#3 Marketing strategies



C

Provide guests with unique keepsakes like sakura-scented candles/soaps

D

Utilize online travel platforms (eg. Agoda) to highlight proximity to famous cherry blossom spots near his inn

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Needs: Reliable forecast so that she can estimate when tourists will flock to the region

Our recommendations

#1 **Maximize foot traffic during sakura season**

A

Offer seasonal promotions on alcohol and snacks suitable for the season

B

Host in-store tasting sessions to encourage customers to explore before committing to a purchase

Our recommendations

#1 **Maximize foot traffic during sakura season**

C

Run geo-targeted ads on platforms such as Instagram and Google to reach tourists visiting the area

D

Partner with local cherry blossom festival organizers to promote her shop as a “must-visit” destination for tourists

Our recommendations

#2 Ensure good inventory levels



A

Use historical sales data to identify best-selling items during past cherry blossom seasons



B

Leverage cherry blossom bloom forecasts to time inventory replenishment just before peak foot traffic

Our recommendations

#3 Reduce inventory obsolescence

A

Stock items with cross-seasonal appeal such as floral/fruity alcohols that are not strictly tied to cherry blossoms

B

Rebrand leftover inventory as “spring specials” to extend their relevance

Our recommendations

#4 Time promotions accurately



A

Use our cherry blossom forecasting model to align promotions and inventory availability with expected peak tourist traffic

B

Start pre-bloom promotions 2 weeks before the predicted bloom dates to create awareness and secure early sales

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Challenge #1: Timing seasonal menus can be tricky if bloom dates are uncertain



Challenge #2: Short bloom periods limit the marketing window



Needs: Early forecasts to plan ingredient procurement and marketing

Our recommendations

#1 Seasonal Menu Planning with flexibility

A

Designate a “Spring Special Menu” with exclusive dishes available only during the season

B

Highlight local ingredients that align with the season, eg. fresh seafood, pickled veg etc

Our recommendations

#1 **Seasonal Menu Planning with flexibility**

C

Introduce the Preview
Menu 2-3 weeks before
the expected bloom to
build anticipation

Our recommendations

#2 Ingredient Procurement and inventory management

A

Implement reservations only in the restaurant to make it easy to anticipate the volume of ingredients needed

B

Partner with local farmers and suppliers to secure fresh, seasonal ingredients with short lead times or on-demand

Our recommendations

#3 **Capitalize on the short marketing window**



A

Start early marketing campaigns to build anticipation for the seasonal menu well before the bloom

B

Leverage on social media platforms and their website to promote the upcoming menu weeks in advance

Our recommendations

#3 Capitalize on the short marketing window



Collaborate with local food bloggers to create buzz about the seasonal menu

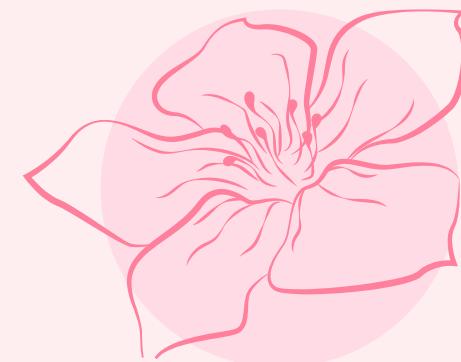


Try to market the menu as celebrating the spirit of Spring and not only the Cherry Blossoms, to extend the appeal beyond the short bloom period

Final results: Predicted bloom dates 2024 & 2025

Akita: Predicted Bloom Date: 2024-07-20
Aomori: Predicted Bloom Date: 2024-05-26
Fukui: Predicted Bloom Date: 2024-04-23
Fukuoka: Predicted Bloom Date: 2024-03-31
Fukushima: Predicted Bloom Date: 2024-05-11
Gifu: Predicted Bloom Date: 2024-04-06
Hiroshima: Predicted Bloom Date: 2024-04-08
Kagoshima: Predicted Bloom Date: 2024-04-03
Kochi: Predicted Bloom Date: 2024-03-31
Kumamoto: Predicted Bloom Date: 2024-04-02
Kyoto: Predicted Bloom Date: 2024-04-11
Nagasaki: Predicted Bloom Date: 2024-04-01
Nara: Predicted Bloom Date: 2024-04-19
Niigata: Predicted Bloom Date: 2024-04-27
Oita: Predicted Bloom Date: 2024-04-04
Okayama: Predicted Bloom Date: 2024-04-09
Osaka: Predicted Bloom Date: 2024-04-09
Saga: Predicted Bloom Date: 2024-04-05
Shizuoka: Predicted Bloom Date: 2024-04-03
Tokushima: Predicted Bloom Date: 2024-04-06
Tokyo: Predicted Bloom Date: 2024-04-06
Tottori: Predicted Bloom Date: 2024-04-14
Toyama: Predicted Bloom Date: 2024-04-18
Wakayama: Predicted Bloom Date: 2024-04-04
Yamagata: Predicted Bloom Date: 2024-05-25

Akita: Predicted Bloom Date: 2025-08-01
Aomori: Predicted Bloom Date: 2025-05-31
Fukui: Predicted Bloom Date: 2025-04-27
Fukuoka: Predicted Bloom Date: 2025-04-03
Fukushima: Predicted Bloom Date: 2025-05-15
Gifu: Predicted Bloom Date: 2025-04-10
Hiroshima: Predicted Bloom Date: 2025-04-12
Kagoshima: Predicted Bloom Date: 2025-04-07
Kochi: Predicted Bloom Date: 2025-04-04
Kumamoto: Predicted Bloom Date: 2025-04-05
Kyoto: Predicted Bloom Date: 2025-04-15
Nagasaki: Predicted Bloom Date: 2025-04-04
Nara: Predicted Bloom Date: 2025-04-23
Niigata: Predicted Bloom Date: 2025-05-01
Oita: Predicted Bloom Date: 2025-04-07
Okayama: Predicted Bloom Date: 2025-04-13
Osaka: Predicted Bloom Date: 2025-04-13
Saga: Predicted Bloom Date: 2025-04-09
Shizuoka: Predicted Bloom Date: 2025-04-07
Tokushima: Predicted Bloom Date: 2025-04-10
Tokyo: Predicted Bloom Date: 2025-04-09
Tottori: Predicted Bloom Date: 2025-04-18
Toyama: Predicted Bloom Date: 2025-04-23
Wakayama: Predicted Bloom Date: 2025-04-08
Yamagata: Predicted Bloom Date: 2025-05-30



THANK YOU

