

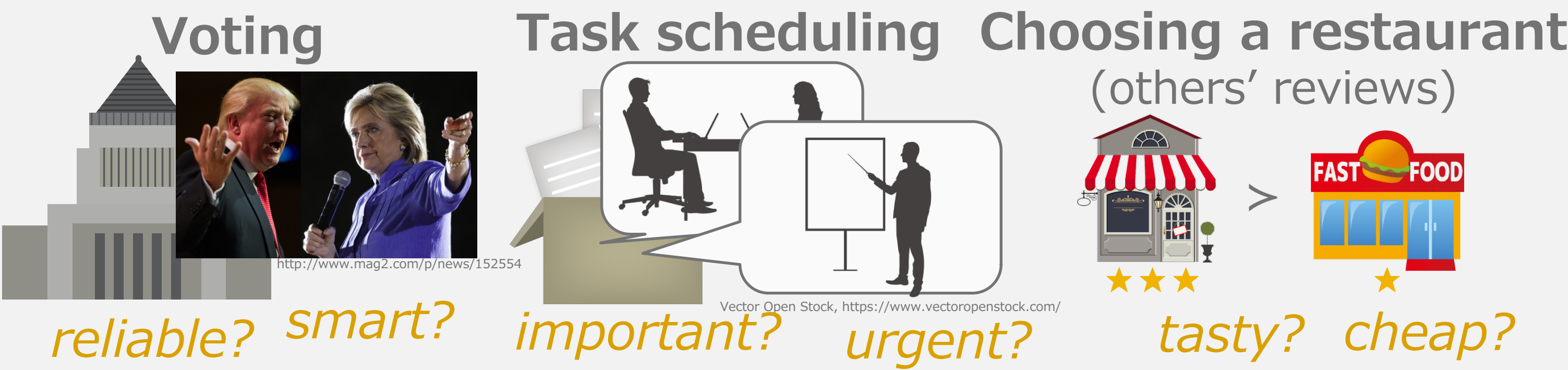
Kotonush: Understanding Concepts Based on Values behind Social Media

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Introduction

Ordering concepts from various perspectives is essential to make decisions in a daily life



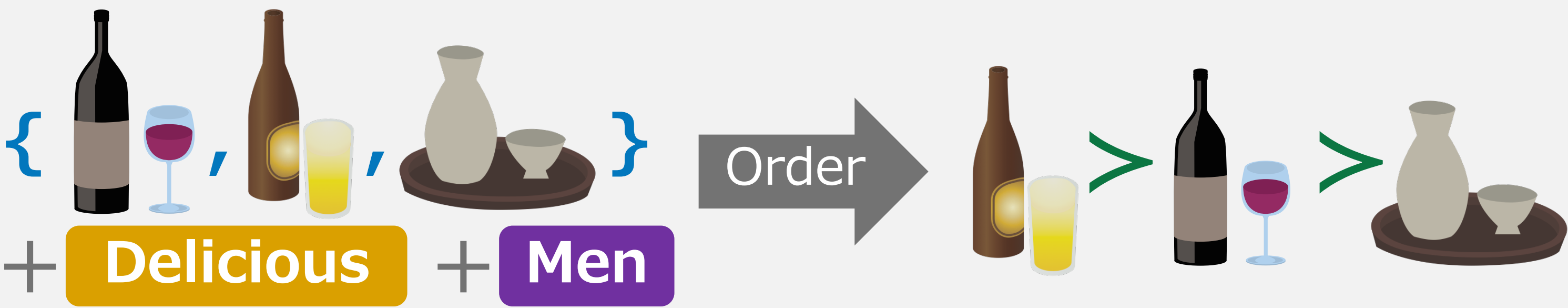
Research Question

Can we derive views on concept ordering in a specific demographics (e.g., men) or time periods from text in the domain

Task Setting

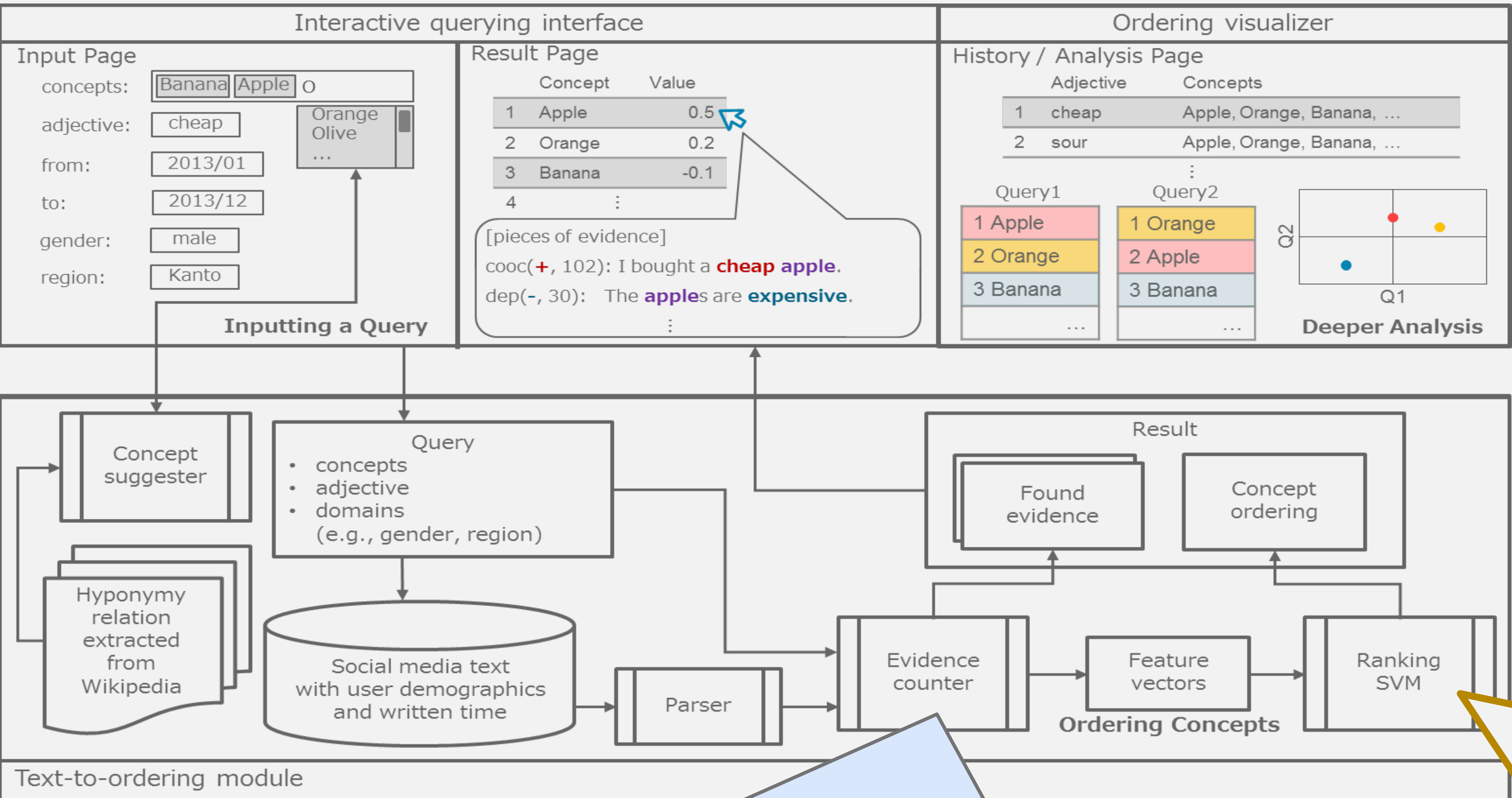
a set of concepts
+ an adjective
+ domain info

concepts ordered by attribute intensity



We regard the ordering that maximizes averaged Spearman's ρ against human orderings as gold standard

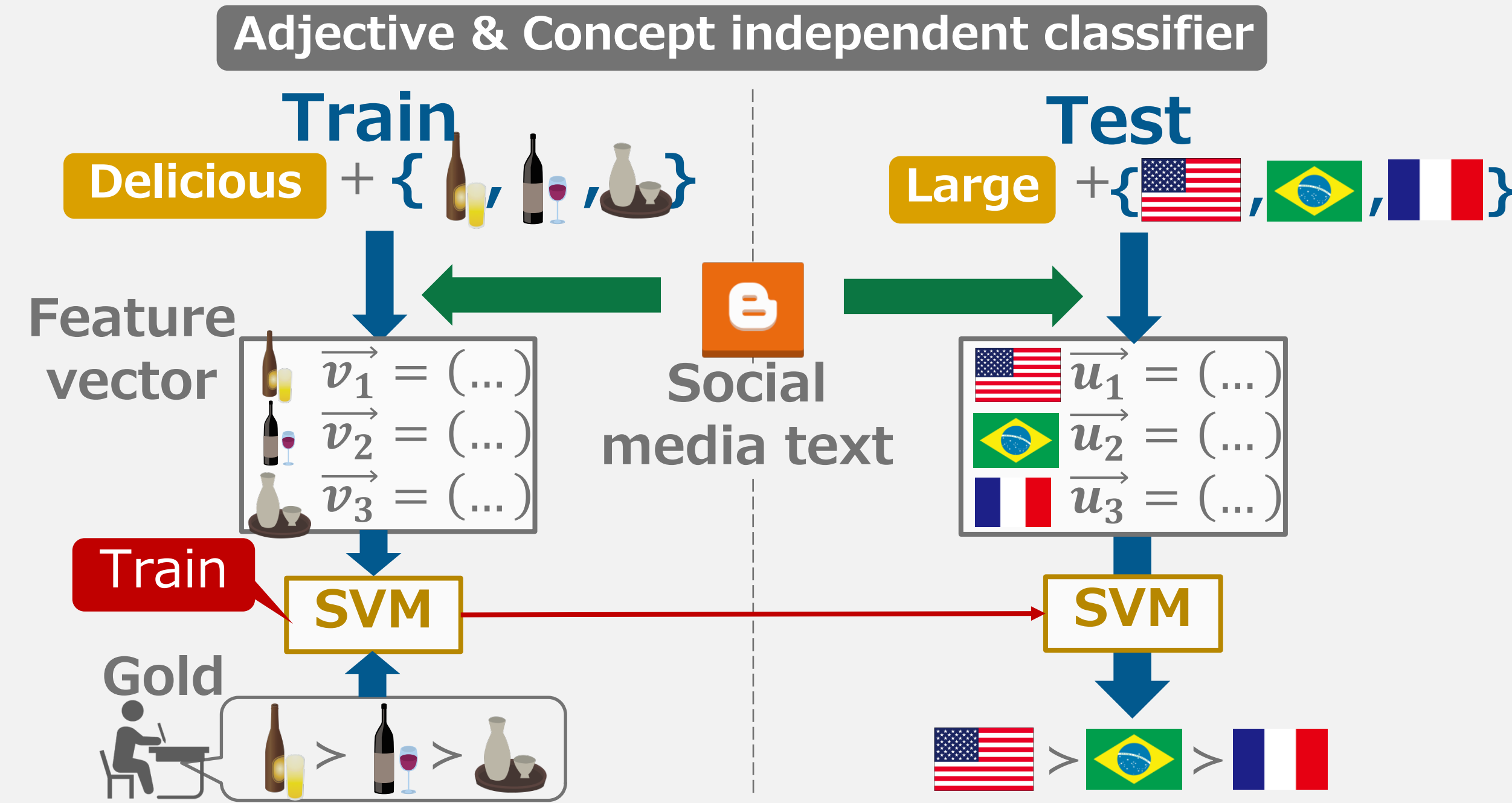
Kotonush



Evidence	Example
Co-occurrence	Look how large that elephant is!
Dependency	Ants are so small that elephants can't kill them
Simile	He is as brave as a lion
Comparative	Elephants are larger than dogs

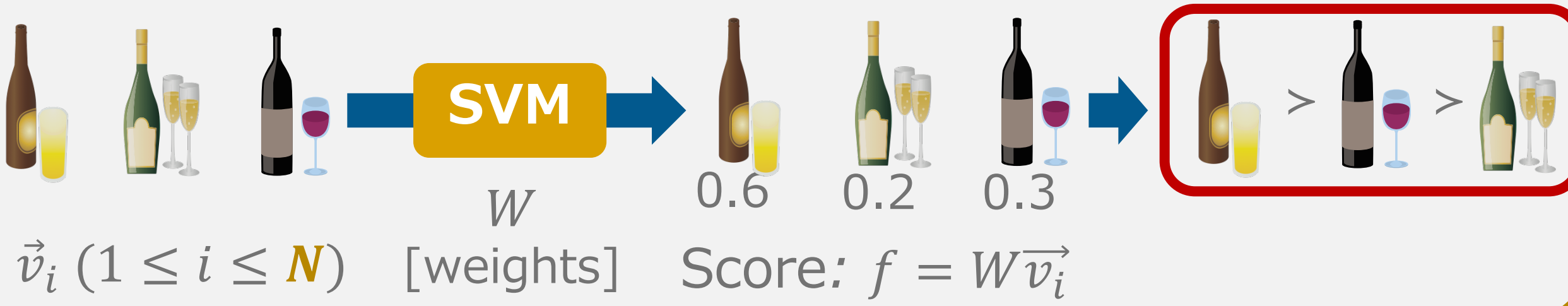
e.g., **Ant** **large** = (PMI^{COOC}_{large}, ...)

Train & Test [Iwanari+, IJCAI-16]



Ranking SVM [Joachims '02]

- Generate a **feature vector** for each concept
- Learn a ranking svm to minimize **the number of incorrect orderings of two items** against **gold**



Gold-standard Examples

[Data for Gold-standard (Gathered by Crowdsourcing)]

53 Twitter users (male/female: 24/29, age: 20s ~ 60s)

[attention points are highlighted]

Query	Ave. ρ		Gold standard orderings (row1: male, row2: female)
flower (beautiful)	0.632	M	sakura, rose, lily, sunflower, lavender, camellia, platycodon, daisy
	0.606	F	sakura, rose, lily, camellia, sunflower, platycodon, lavender, daisy
jewelry (elegant)	0.443	M	emerald, sapphire, ruby, pearl, amethyst, opal
	0.552	F	pearl, sapphire, emerald, ruby, amethyst, opal
alcohol (delicious)	0.151	M	champagne, wine, beer, highball, chuhai , whisky, shochu
	0.541	F	champagne, chuhai , wine, highball, beer, whisky, shochu
sport (entertaining)	0.407	M	baseball , football, tennis, volleyball, basketball, table tennis, pro wrestling, sumo
	0.558	F	football, volleyball , tennis, baseball, table tennis, basketball, sumo, pro wrestling
food (yummy)	0.395	M	steak, ramen , curry, pizza, pasta, fried rice, hamburger
	0.406	F	steak, pasta, pizza, curry, ramen , hamburger, fried rice
animal (lovely)	0.721	M	squirrel, rabbit, penguin, dog , panda, horse, lion, lizard
	0.679	F	dog , squirrel, penguin, rabbit, panda, lion, horse, lizard
vegetable (tasty)	0.448	M	pumpkin, onion, eggplant, cucumber, spinach, napa cabbage, sprout, broccoli
	0.283	F	pumpkin, onion, spinach, napa cabbage, eggplant, cucumber, broccoli, sprout
appliance (useful)	0.793	M	PC , smartphone, car navigation system, digital camera, printer, speaker
	0.817	F	smartphone , PC, car navigation system, digital camera, printer, speaker
flesh (preferable)	0.620	M	beef, chicken, pork, lamb
	0.492	F	chicken, pork, beef, lamb
fast-food (tasty)	0.673	M	MOS Burger, KFC, Mister Donut, McDonald's
	0.463	F	same
fruit (large)	0.896	M	melon, apple, peach, persimmon, grape , tangerine, strawberry, cherry
	0.880	F	melon, apple, peach, persimmon, tangerine, grape , strawberry, cherry
actress (cute)	0.669	M	Ki Kitano, Yuka, Kazue Fukishi, Akina Minami, Yumiko Shaku, Rinka, Tomochika
	0.595	F	same

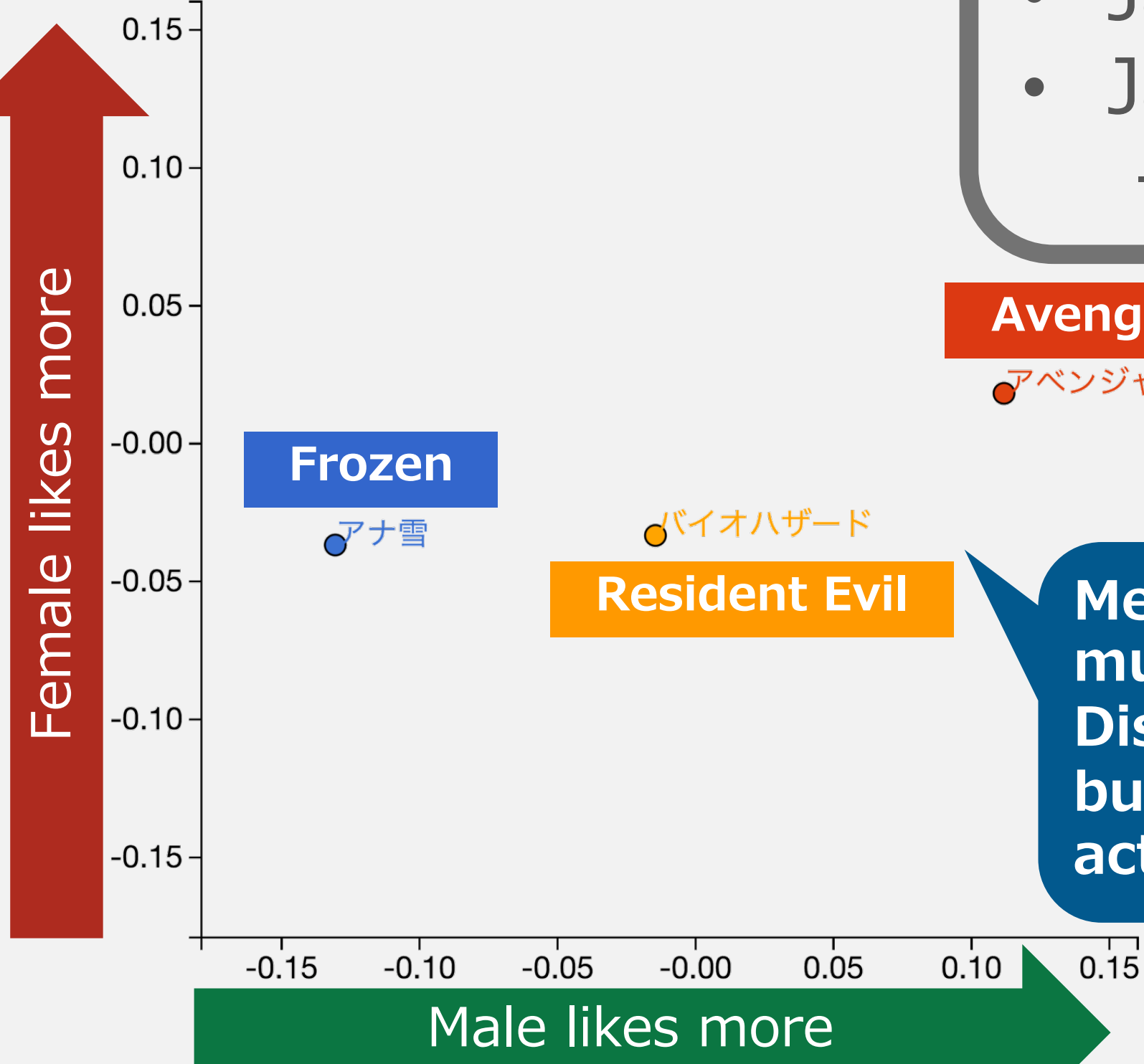
This column shows the average Spearman's ρ between the gold standard and human orderings => How much people in the same domain (e.g., men) agree with their gold

Case Studies

[Data]

- ~ 25 billion tweets
- Japanese
- Jan. 2012 - Dec. 2015

Movie (Likable): Genders



Men like action movies much better than Disney movies but women don't like action movies so much

Flower (Beautiful): Seasons

Mar. - May. Spring	Jun. - Aug. Summer	Sep. - Nov. Winter
Cherry	Sunflower	Mum
Mum	Cherry	Sunflower
Sunflower	Mum	Cherry

This shows blooming season of each flower

Dengue fever spreaded in 2014

Fruit (Delicious): Regions

Tohoku	Shikoku
Apple	Tangerine
Strawberry	Apple
Tangerine	Strawberry

Disease (Fearful): Years

2013	2014
Influenza	Dengue
Malaria	Influenza
Dengue	Malaria

Tohoku and Shikoku regions are famous for production of apple and tangerine, respectively