

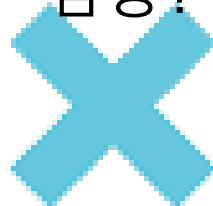
Data Prediction Model and Machine Learning

Online course #2
Modelling

짜장?



짬뽕?



Decision = Comparison + Choice

Semi-basement studio (반지하 단칸방)

vs.

Apartment in Gangnam-district (강남 아파트)

Doing things you don't like but good at
(좋아하지 않지만 잘하는 일 하기)

Vs.

Doing things you like but not good at
(잘하지 못하지만 좋아하는 일 하기)

이미지					
제품명	성우모바일 코넥티아 북 에어	HP 파빌리온 13-B216TU	LG전자 울트라PC 그 램 13ZD950-GX50K	ASUS X302LA-R4164	APPLE 맥북에어 MJVE2KH/A
CPU 종류	코어i5-5세대 i5-5200u(2.2GHz)	코어i5-5세대 i5-5200u(2.2GHz)	코어i5-5세대 i5-5200u(2.2GHz)	코어i5-5세대 i5-5200u(2.2GHz)	코어i5-5세대 (1.6GHz)
화면크기	33.78cm(13.3인치)	33.78cm(13.3인치)	33.78cm(13.3인치)	33.78cm(13.3인치)	33.78cm(13.3인치)
해상도	1920 x 1080	1366 x 768	1920 x 1080	1920 x 1080	1440 x 900
저장장치	128GB SSD	128GB SSD	128GB SSD	128GB SSD	128GB SSD
메모리	4GB DDR3L	4GB DDR3L	4GB DDR3L	4GB DDR3L	4GB DDR3L
운영체제	미포함	미포함	미포함	미포함	Mac OS X Yosemite
무게	1.39Kg	1.55Kg	980g	1.59kg	1.35Kg
보증기간	1년(택배접수)	1년(방문,택배접수)	1년(방문,택배접수)	1년(방문,택배접수)	1년(방문,택배접수)
가격대	55만원대	59만원대	94만원대	93만원대	102만원대

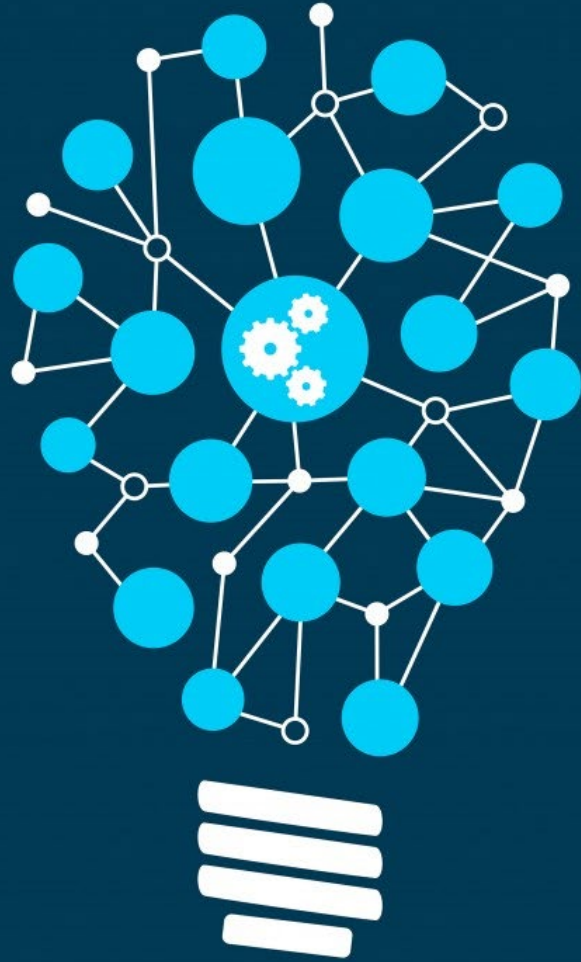


Product	Weight	Speed	Capacity	Price
A	200g	2.7GHz	64G	1,200\$
B	190g	2.5GHz	32G	800\$

Product	Weight	Speed	Capacity	Price	10 or more features
A	200g	2.7GHz	64G	1,200\$...
B	190g	2.5GHz	32G	800\$...
		...	(1000 or more products)	...	



MACHINE LEARNING





Machine Learning



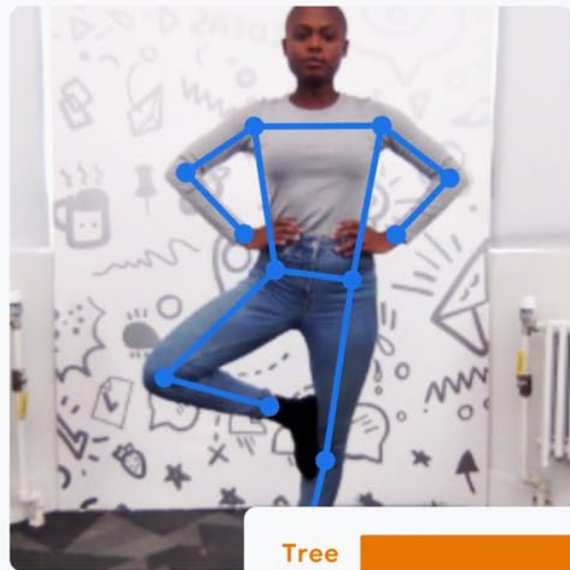
Judgement (판단력)

Teachable Machine

Train a computer to recognize your own images, sounds, & poses.

A fast, easy way to create machine learning models for your sites, apps, and more – no expertise or coding required.

Get Started



Tree 100%

Wings

tm-my-image-model.zip



metadata.json



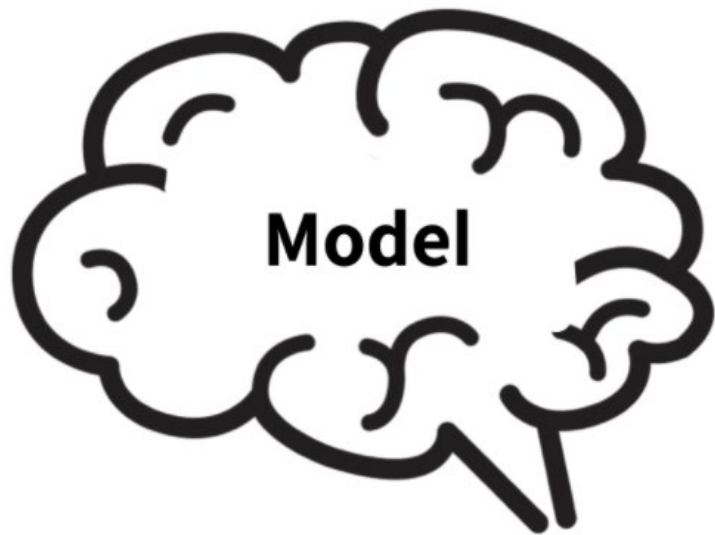
model.json



weights.bin

Judgement(판단력)

Model



Mask On 

Webcam 



Hold to Record 

Add Image Samples:

Class 2 

Add Image Samples:



Webcam



Upload

Training


Train Model

Advanced 



Preview 


Export Model


You must train a model on the left before you can preview it here.


Mask On 


103 Image Samples


 Webcam  Upload



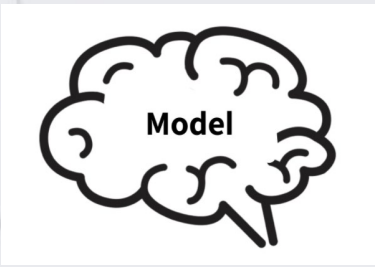

Mask Off 


Webcam 




Hold to Record 

30 Image Samples



Preview  Export Model

You must train a model on the left before you can preview it here.

Mask On 



103 Image Samples



Webcam



Upload



Mask Off 



87 Image Samples



Webcam



Upload



Training

Training...

00:04 - 36 / 50

Advanced





Preview






Export Model



You must train a model on the left before you can preview it here.

Mask On  



103 Image Samples


 




Mask Off  

87 Image Samples


 



 Add a class

Training

Model Trained

Advanced 

Preview  Export Model

Input ON Webcam 

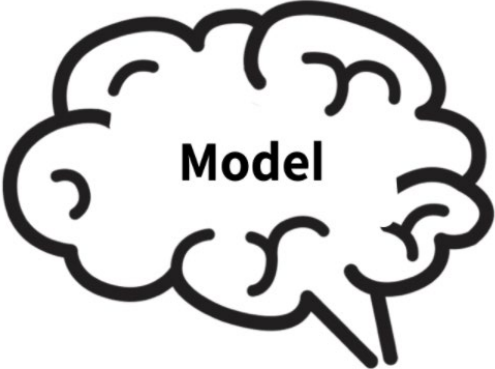


Output

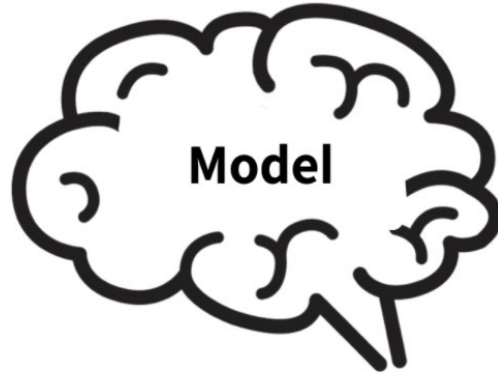
Mask On  100%

Mask Off 

Training 'Model' with data
(Model learns from data)



Prediction from 'Model'



Mask on
(99.3%)

Congrat!!

You now know what model is

≡

table

열
column

행
row

Date	Day	Temp.	Sales
2020.9.1.	Mon	25	50
2020.9.2.	Tue	24	49
2020.9.3.	Wed	23	46

Date	2020.9.1.	2020.9.2.	2020.9.3.
Day	Mon	Tue	Wed
Temp.	25	24	23
Sales	50	49	46

Date	Day	Temp.	Sales
2020.9.1.	Mon	25	50
2020.9.2.	Tue	24	49
2020.9.3.	Wed	23	46

Not a table

Date	2020.9.1.	2020.9.2.	2020.9.3.
Day	Mon	Tue	Wed
Temp.	25	24	23
Sales	50	49	46

열
column



특성 (feature)
속성 (attribute)
변수(variable)
field

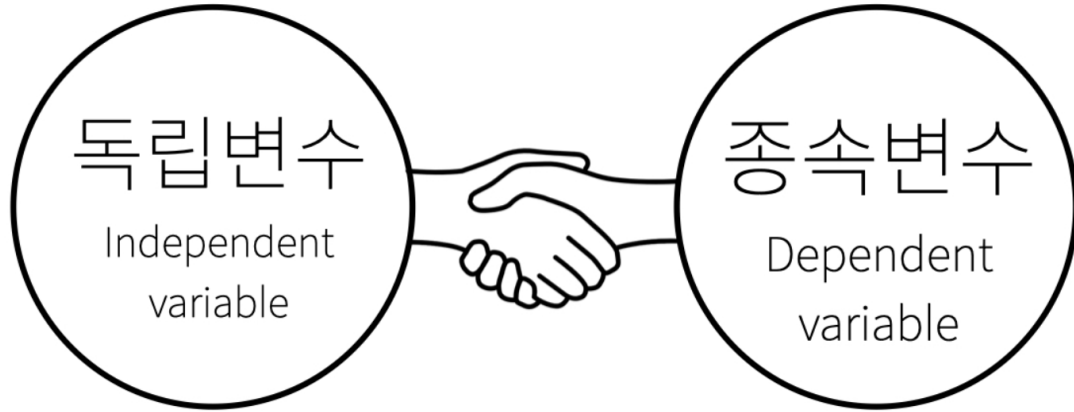
Date	Day	Temp.	Sales
2020.9.1.	Mon	25	50
2020.9.2.	Tue	24	49
2020.9.3.	Wed	23	46

행
row



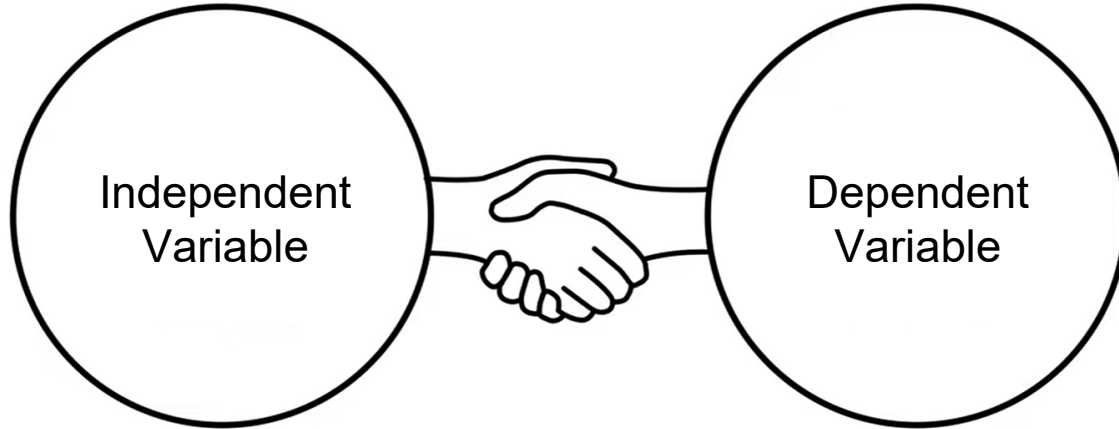
개체 (instance)
관측치(observed value)
기록 (record)
사례 (example)
경우 (case)





Cause

Result



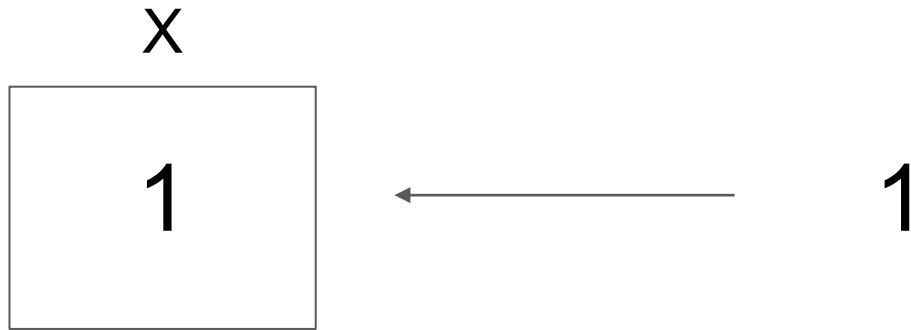
Independent
Variable

Dependent
Variable

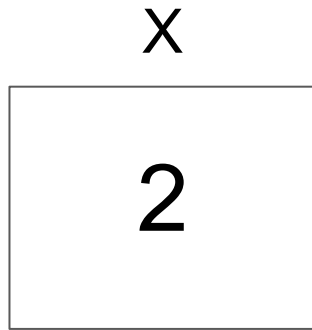
변수

variable

$$X = 1$$

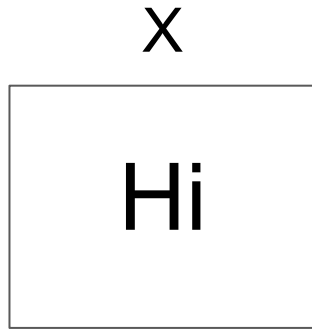


$$X = 2$$



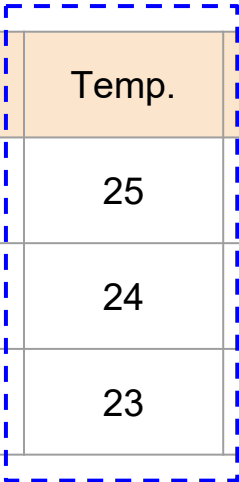
2

X = "Hi"



"Hi"

Date	Day	Temp.	Sales
2020.9.1.	Mon	25	50
2020.9.2.	Tue	24	49
2020.9.3.	Wed	23	46



Date	Day	Temp.	Sales
2020.9.1.	Mon	25	50
2020.9.2.	Tue	24	49
2020.9.3.	Wed	23	46

Causality

Independent
variable: **Cause**

Dependent variable:
Result

A diagram illustrating causality. At the top, the word "Causality" is written in red. Below it, a red bracket connects the "Independent variable: Cause" on the left to the "Dependent variable: Result" on the right. A red arrow points from the "Result" label down to the "Sales" column of the table below. A grey arrow points from the "Cause" label down to the "Temp." column of the table.

Date	Day	Temp.	Sales
2020.9.1.	Mon	25	50
2020.9.2.	Tue	24	49
2020.9.3.	Wed	23	46

Correlation

Independent
variable: **Cause**

Dependent variable:
Result

Date	Day	Temp.	Sales
2020.9.1.	Mon	25	50
2020.9.2.	Tue	24	49
2020.9.3.	Wed	23	46

Correlation

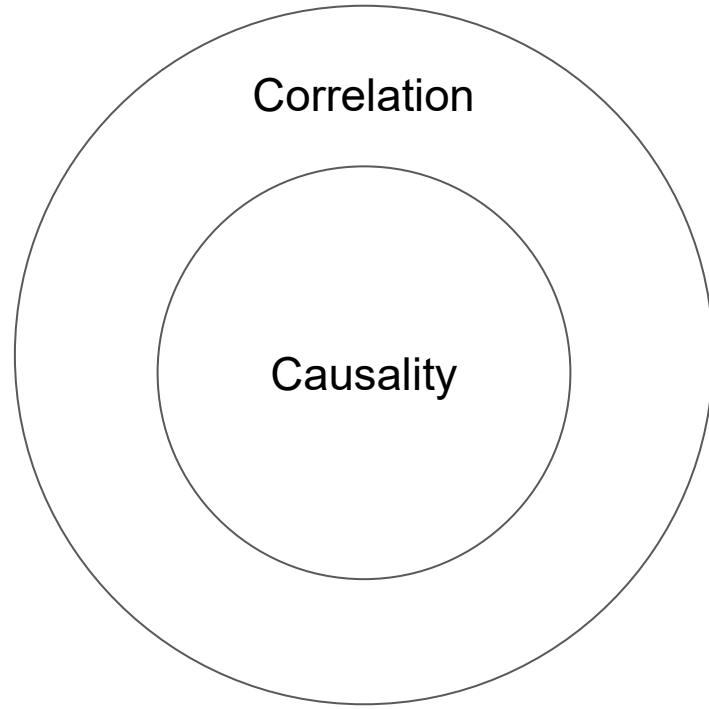
Independent
variable: **Cause**

Dependent variable:
Result

Date	Day	Temp.	Sales
2020.9.1.	Mon	25	50
2020.9.2.	Tue	24	49
2020.9.3.	Wed	23	46

Sales →
Temperature ???

(Seems impossible
unless you are God)



Correlation

Causality

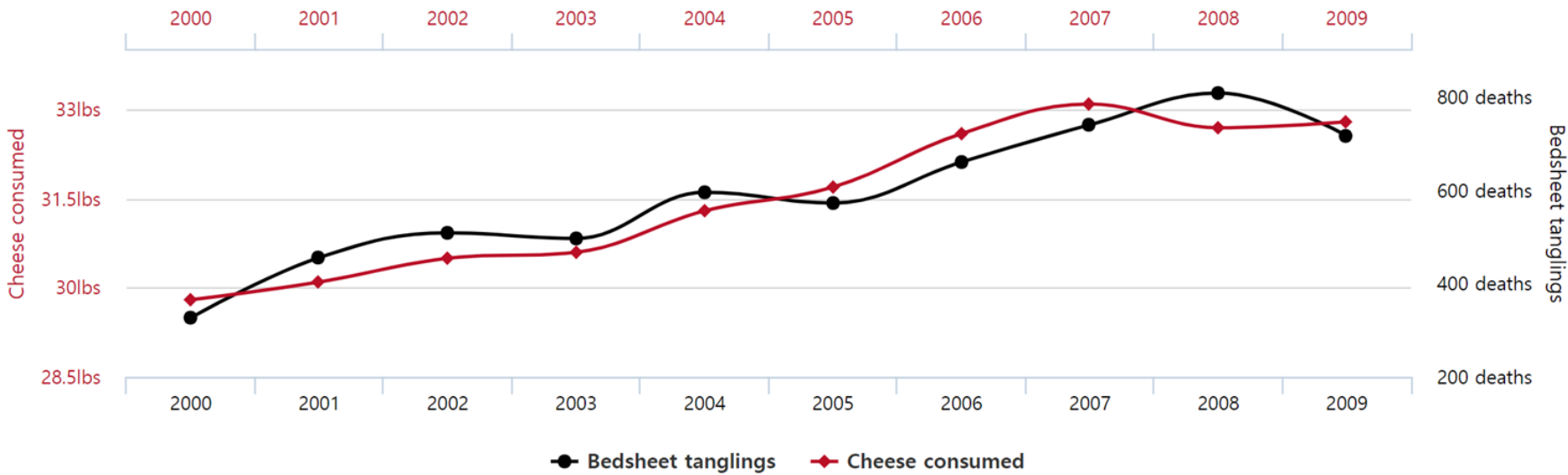


Per capita cheese consumption

correlates with

Number of people who died by becoming tangled in their bedsheets

Correlation: 94.71% (r=0.947091)



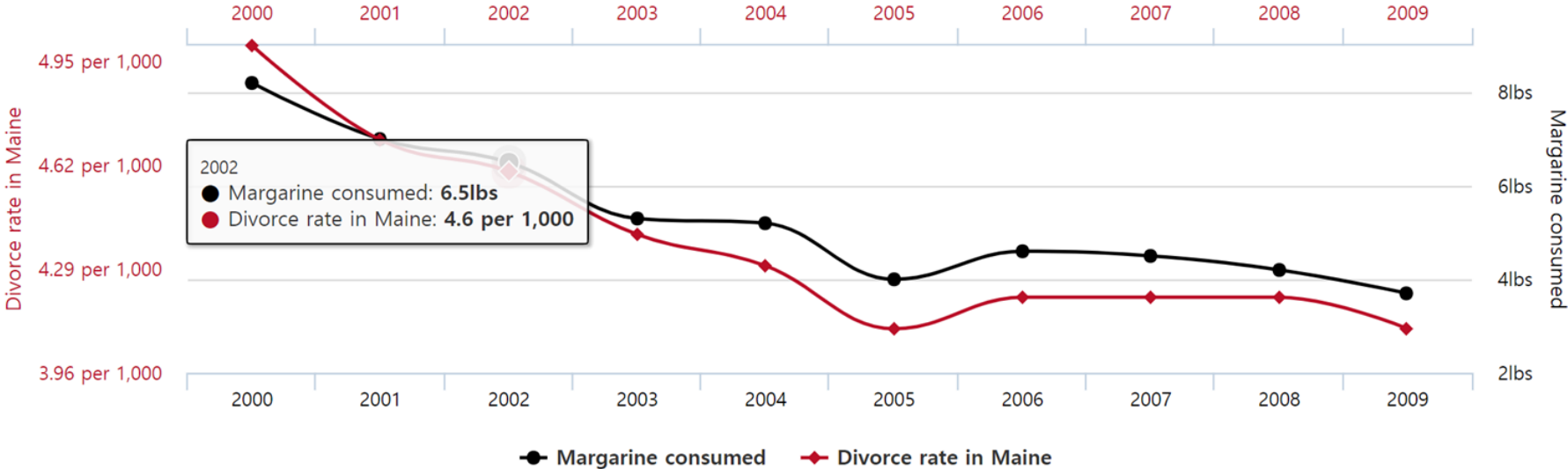


Divorce rate in Maine

correlates with

Per capita consumption of margarine

Correlation: 99.26% (r=0.992558)



- The independent variable is the **cause**.
- The dependent variable is the **result**.
- The relationship between the independent variable and the dependent variable is called a **causal relationship**.
- The **causal relationship** is included in the **correlation**.