Introducing Machine Learning

What is Machine Learning

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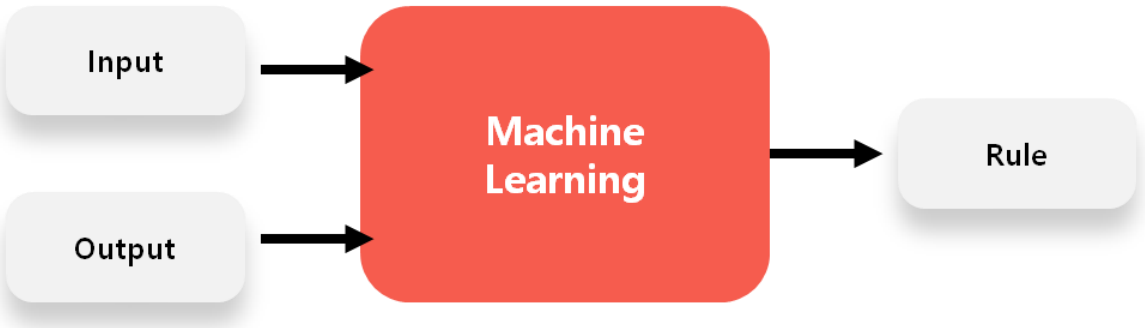
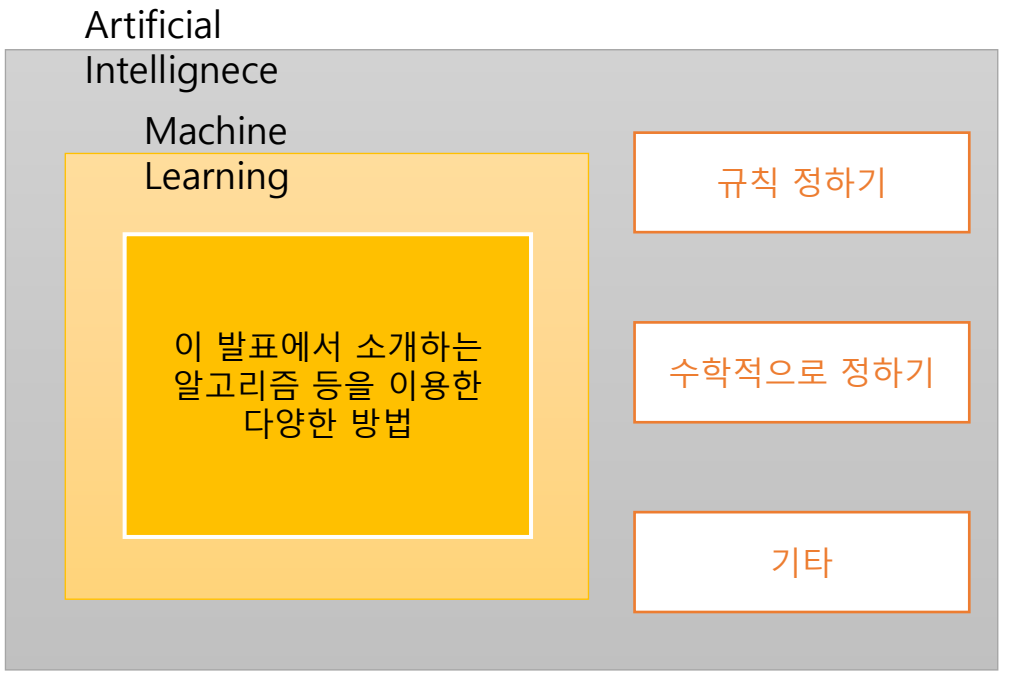
Machine Learning



- Correlation with AI and ML



Type of Machine Learning

supervised learning(Classification problem)

- Supervised learning is training a machine learning model by inputting the correct answer to a problem into a computer.

키	체중	성별
180	75	남자
155	48	여자
170	65	남자

feature

Dependent variable

- Classify problems that predict classifications such as gender
- Binary classification of gender into male and female
- Multiclass classification to classify by multiple attributes
- Solve as a classification problem if the variable corresponding to the data representing the correct answer is a discrete value rather than a continuous value
- Feature data are independent variables
- Correct answer data is the dependent variable

키	체중	성별
175	70	?

input

predict

남자

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Type of Machine Learning

supervised learning(Regression problem)

- Supervised learning is training a machine learning model by inputting the correct answer to a problem into a computer.

키	체중	신발 크기
180	75	265
155	48	240
170	65	230

feature

Dependent variable

- Another method of supervised learning is regression
- A regression problem is to make predictions by attaching meaning to the large and small values of numeric values.

키	체중	신발 크기
175	70	?

input

predict

신발 크기

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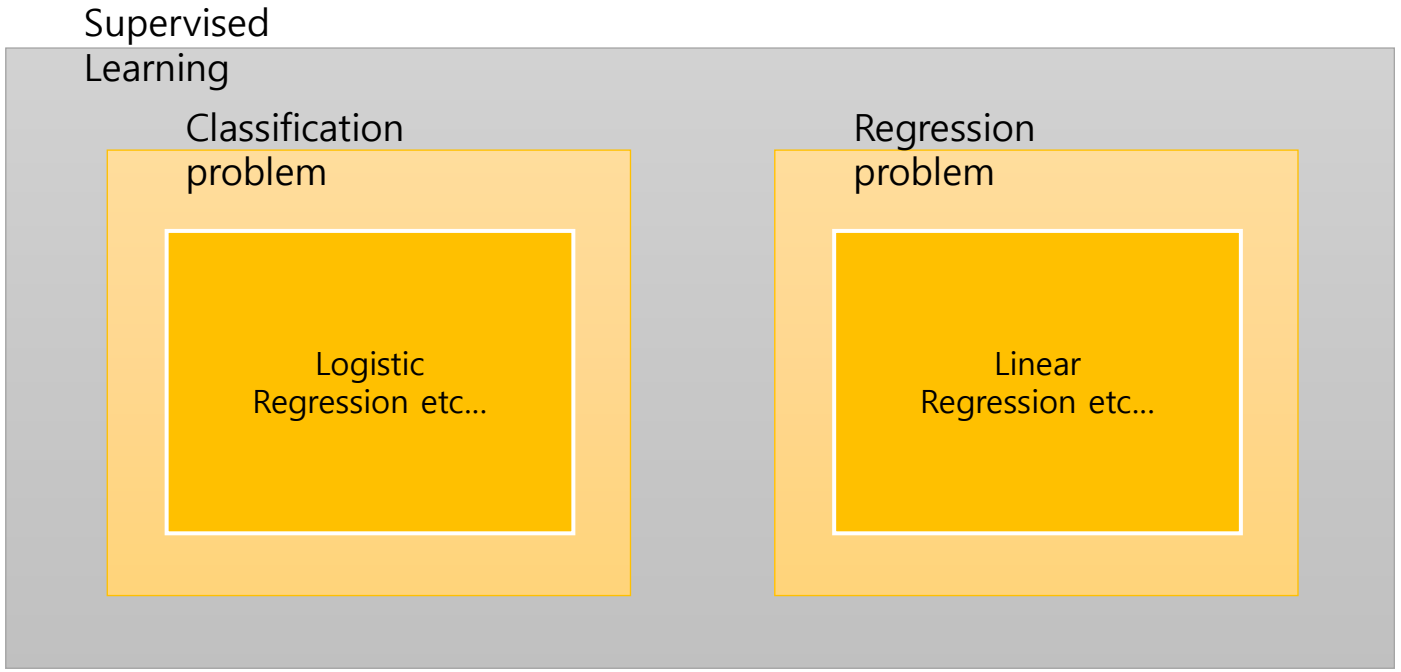
Correlation with classification and regression



Supervised Learning Algorithm

Classification and Regression Problems

Number	Algorithm name	Classification	Regression
1	Linear regression	X	O
2	Regularization	X	O
3	Logistic regression	O	X
4	Support vector machine	O	O
5	Support vector machine using kernel	O	O
6	Naïve Bayes classification	O	X
7	Random forest	O	O
8	Neural network	O	O
9	k-nearest neighbors algorithm, kNN	O	O

Type of Machine Learning

unsupervised learning(principal component analysis)

- Supervised learning is a method of learning by combining independent and dependent variables. Whereas unsupervised learning is a method in which there is no dependent variable indicating the correct answer

수학	과학	국어	사회
76	89	30	20
88	92	33	29
52	35	90	91
45	33	90	91
60	65	55	70

Principal component analysis
(dimensionality reduction)

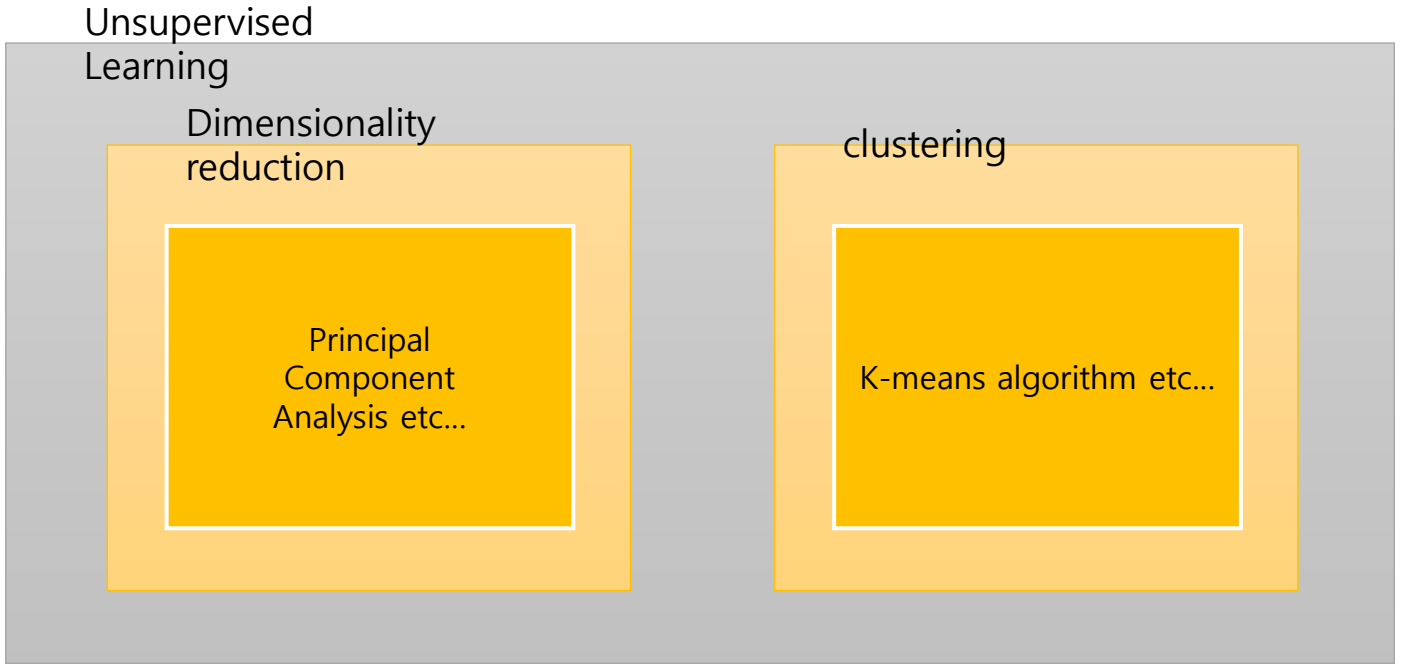
첫 번째 성분
-56.1
-54.3
49.1
56.6
4.6

Type of Machine Learning

unsupervised learning(clustering)

- Supervised learning is a method of learning by combining independent and dependent variables. Whereas unsupervised learning is a method in which there is no dependent variable indicating the correct answer
- Clustering is the classification of input data into several groups.

Correlation with dimensionality reduction and clustering



Unsupervised Learning Algorithms

Dimensionality reduction and clustering

Number	Algorithm name	Dimensionality reduction	clustering
10	Principal component analysis, PCA	O	X
11	Latent semantic analysis, LSA	O	X
12	Non-negative matrix factorization, NMF	O	X
13	Latent Dirichlet allocation, LDA	O	X
14	k-means algorithm	X	O
15	Gaussian mixture model	X	O
16	Local linear embedding, LLE	O	X
17	T-distributed stochastic neighbor embedding, t-SNE	O	X

Use of machine learning

- Machine learning is used in various fields.
- There are fields that have achieved results, such as automatic classification of documents and automatic translation
- Since ancient times, the main concept of machine learning has been used to predict weather information