

성균관대학교 S / O / R

로봇학회



2022년 04월 21일

AI

n 주 차

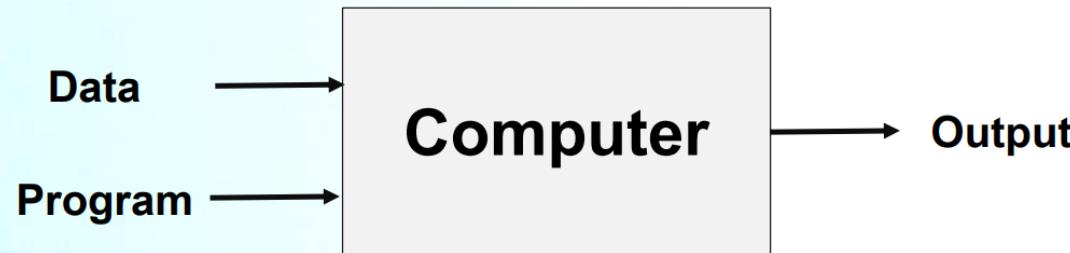
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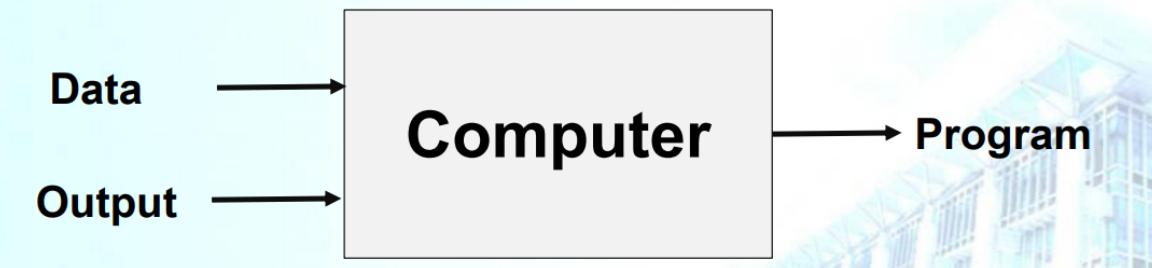
Machine Learning

Machine Learning의 정의: Arthur Samuel (1959). Machine Learning: Field of study that gives computers the ability to learn without being explicitly programmed.

■ Traditional program



■ Machine learning



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Machine Learning

Machine Learning의 분류:

1. Supervised Learning: 입력에 대한 정답이 있다.
2. Unsupervised Learning: 입력에 대한 정답이 없다.

Simple Linear Regression

Linear Regression

Summary

- Regression
- Linear Regression
- Hypothesis $H(x) = Wx + b$
- Cost function $cost(W, b) = \frac{1}{m} \sum_{i=1}^m (H(x_i) - y_i)^2$
- Goal: Minimize cost

Cost Minimization

Gradient Descent

Gradient descent algorithm

$$W := W - \alpha \frac{1}{m} \sum_{i=1}^m (W(x_i) - y_i)x_i$$

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Multivariable

$$\begin{pmatrix} x_{11} & x_{12} & x_{13} \\ x_{21} & x_{22} & x_{23} \\ x_{31} & x_{32} & x_{33} \\ x_{41} & x_{42} & x_{43} \\ x_{51} & x_{52} & x_{53} \end{pmatrix} \cdot \begin{pmatrix} w_{11} & w_{12} \\ w_{21} & w_{22} \\ w_{31} & w_{32} \end{pmatrix} = \begin{pmatrix} x_{11}w_{11} + x_{12}w_{21} + x_{13}w_{31} & x_{11}w_{12} + x_{12}w_{22} + x_{13}w_{32} \\ x_{21}w_{11} + x_{22}w_{21} + x_{23}w_{31} & x_{21}w_{12} + x_{22}w_{22} + x_{23}w_{32} \\ x_{31}w_{11} + x_{32}w_{21} + x_{33}w_{31} & x_{31}w_{12} + x_{32}w_{22} + x_{33}w_{32} \\ x_{41}w_{11} + x_{42}w_{21} + x_{43}w_{31} & x_{41}w_{12} + x_{42}w_{22} + x_{43}w_{32} \\ x_{51}w_{11} + x_{52}w_{21} + x_{53}w_{31} & x_{51}w_{12} + x_{52}w_{22} + x_{53}w_{32} \end{pmatrix}$$

[n, 3]

[3, 2]

[n, 2]

$$H(X) = XW$$

성 균 관 대 학 교

Thank You

로 봇 동 아 리