Google Developer Student Clubs

ML/DL Study W01

- Basic Concepts of ML
- Linear Regression
- How to minimize cost
- Multi-variable linear regression
- Logistic Regression

Basic Concepts of ML

What is ML?

ML

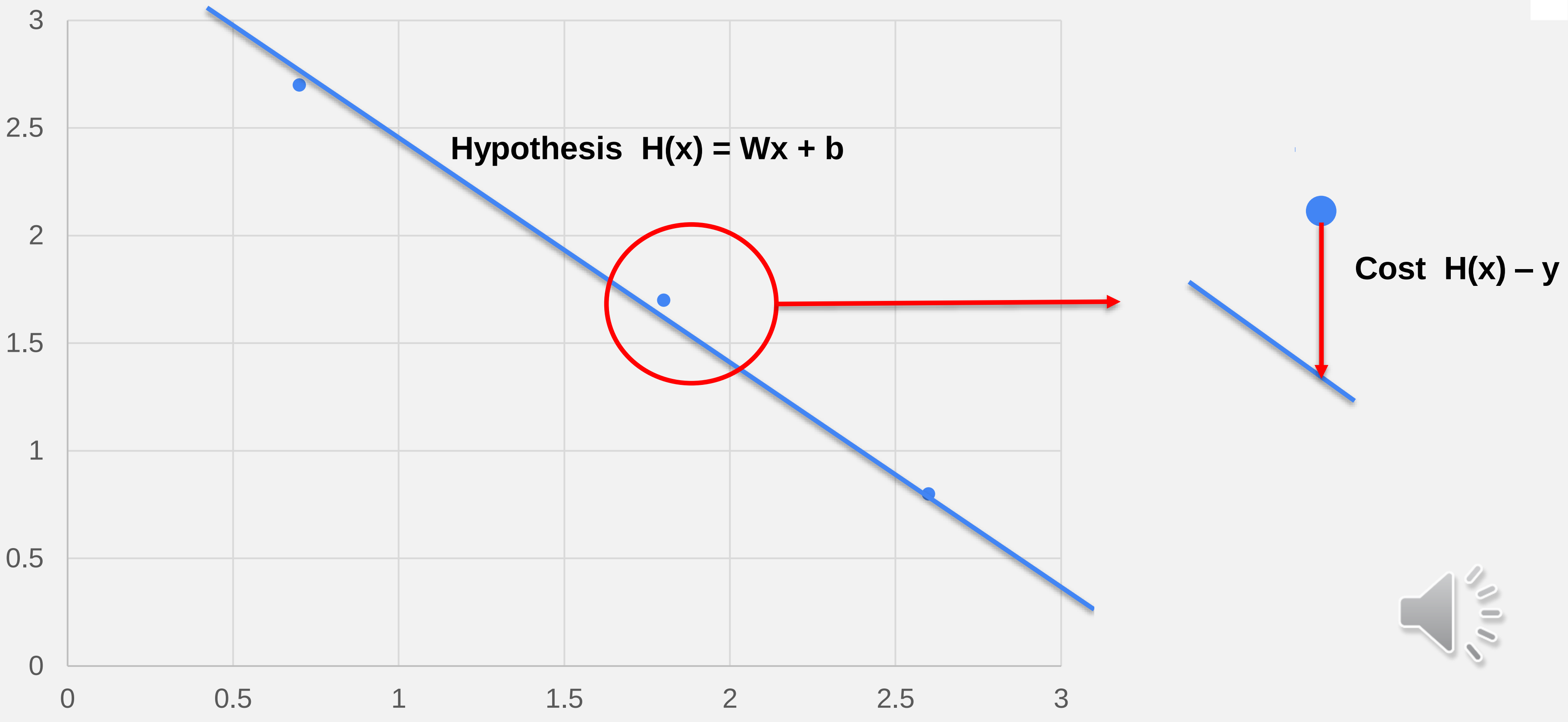
Training Data Set의 형태 → Supervised Learning **vs** Unsupervised Learning

Supervised Learning

- Regression
- Binary Classification
- Multi-label Classification

Linear Regression

Linear Regression



Linear Regression

$$cost(W, b) = \frac{1}{m}\sum_{i=1}^{m}(H(x_i) - y_i)^2$$

How to minimize cost

Goal : Minimize cost

$$cost(W,b) = \frac{1}{2m}\sum_{i=1}^{m}(H(x_i) - y_i)^2$$

$$W := W - \alpha \frac{\partial}{\partial W} \frac{1}{2m} \sum_{i=1}^{m}(H(x_i) - y_i)^2$$

$$W := W - \alpha \frac{\partial}{\partial W} cost(W)$$

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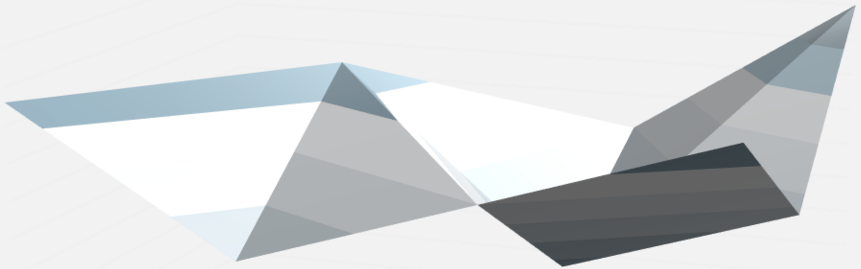
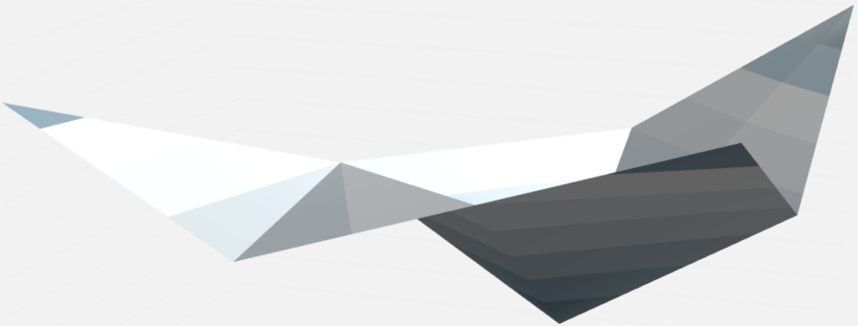
Goal : Minimize cost



Local minimum =/ Global minimum



Local minimum = Global minimum

Multi-variable linear regression

Multi-variable linear regression

Hypothesis

$$H(x1, x2, x3) = w1x1 + w2x2 + w3x3 + b$$

$$H(X) = XW$$

Cost function

$$cost(W, b) = \frac{1}{m}\sum_{i=1}^{m}(H(x1, x2, x3) - y_i)^2$$

Gradient descent

x1	x2	x3	y(final)
73	80	75	152
93	88	93	185
89	91	90	180

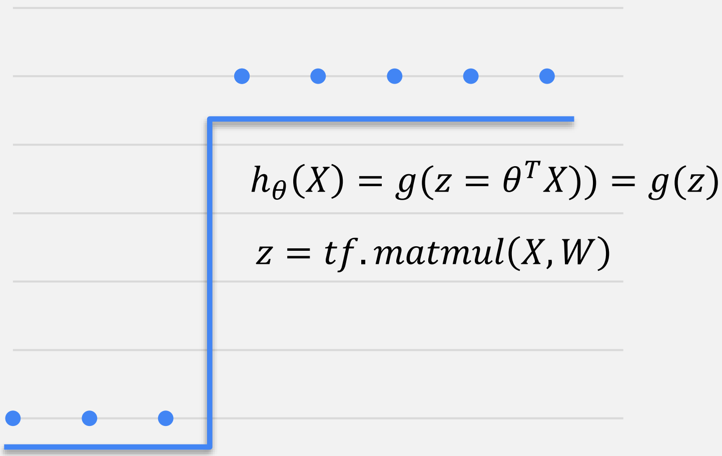
Logistic Regression

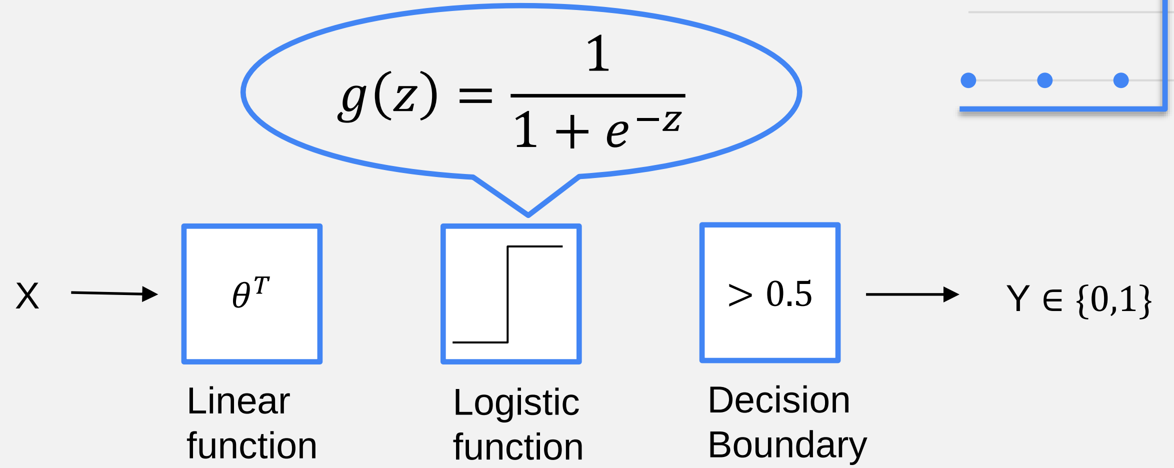
Logistic Regression

Linear ~ Continuous (Measured)

Logistic ~ Discrete (Counted)

Binary Classification





Review

- cost = tf.reduce_mean (tf.square (hypothesis – y_data))

- tf.reduce_sum, tf.reduce_mean

- x = [[1, 1, 1],

  [1, 1, 1]] : rank(x) = 2

- tf.reduce_sum (x, axis = 0) = [2, 2, 2] : rank → 1, 0 index의 1차원 제거

- tf.reduce_sum (x, axis = 1) = [3, 3], 1 index의 2차원 제거

- tf.reduce_sum (x) = 6 : rank → 0, scalar value