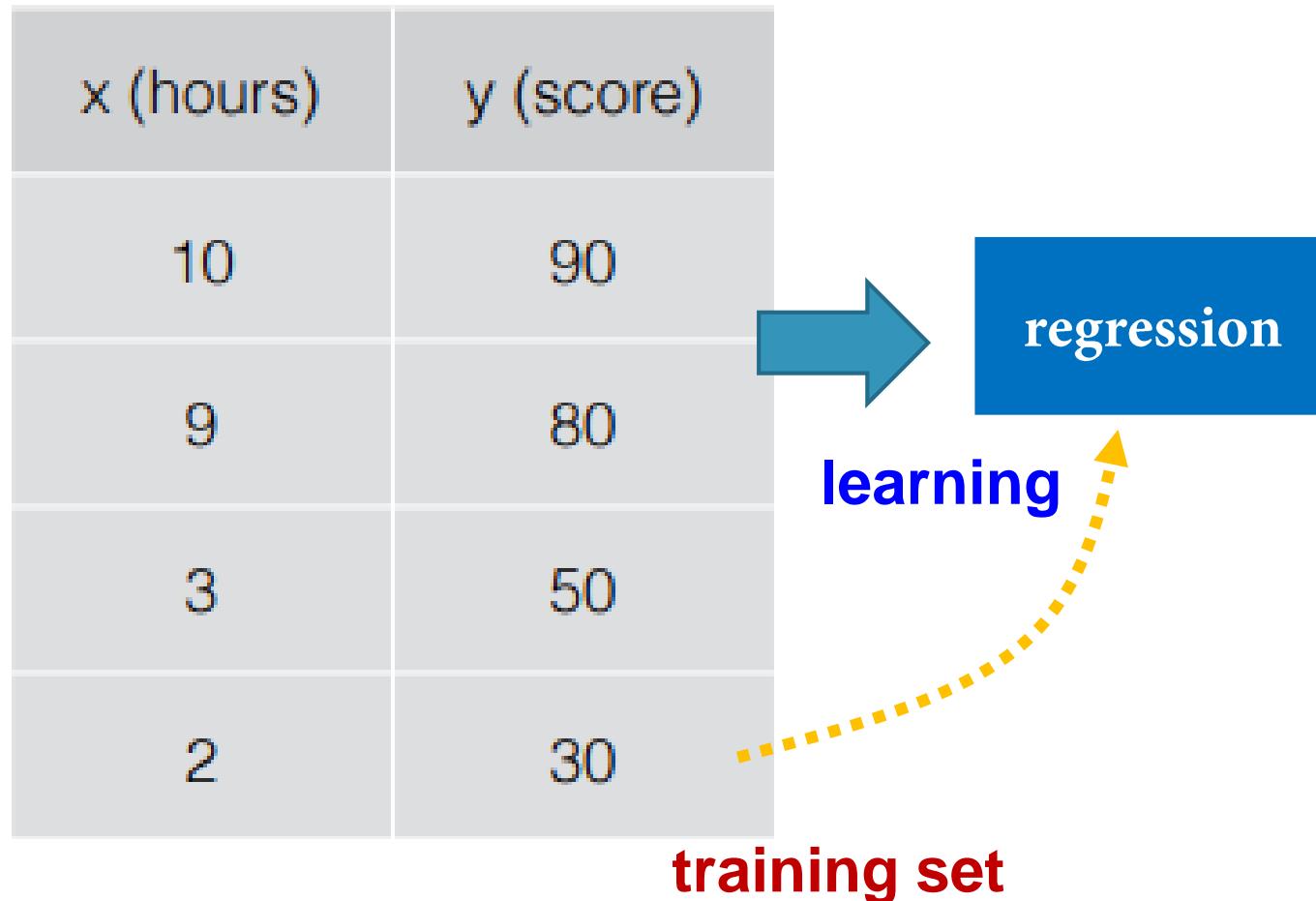




Lecture 02

Linear Regression

Predicting exam score: regression

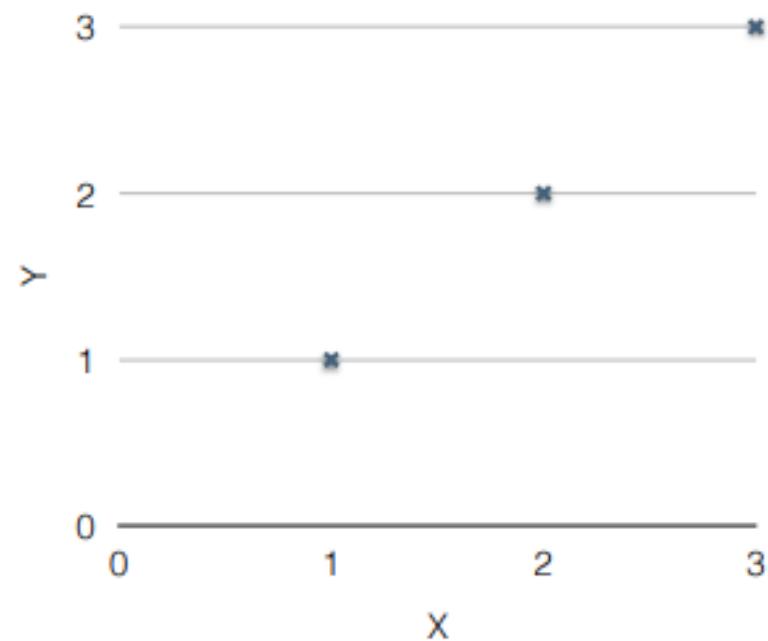


Regression (data)

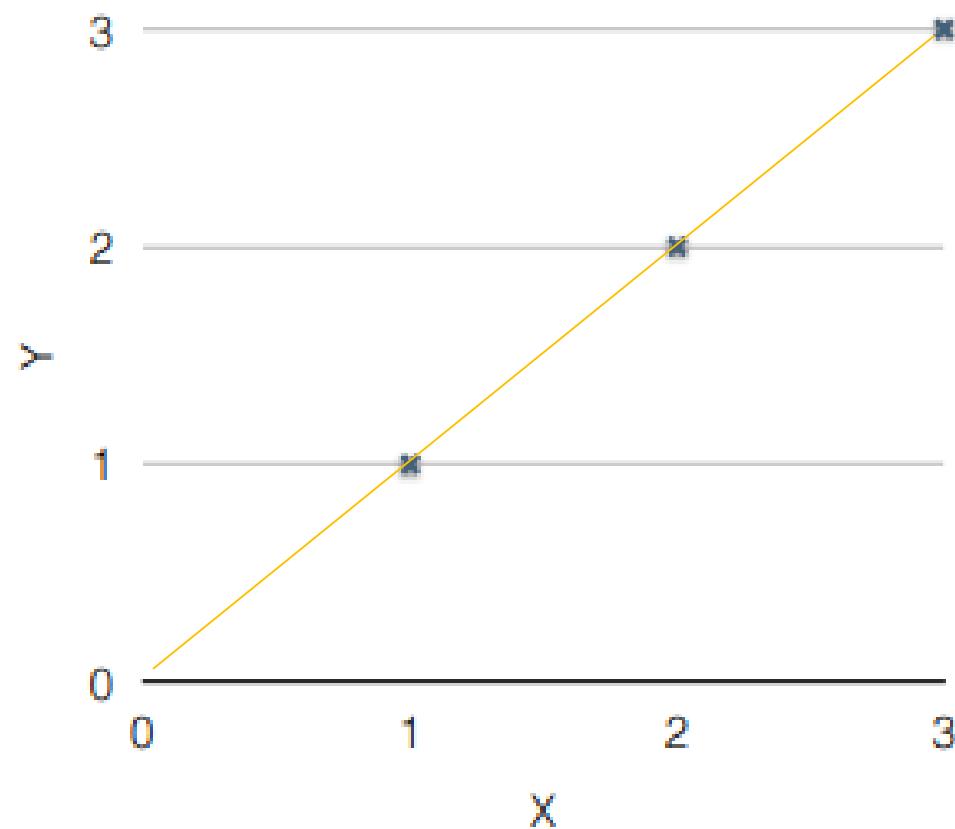
X	Y
1	1
2	2
3	3

Regression (presentation)

X	Y
1	1
2	2
3	3

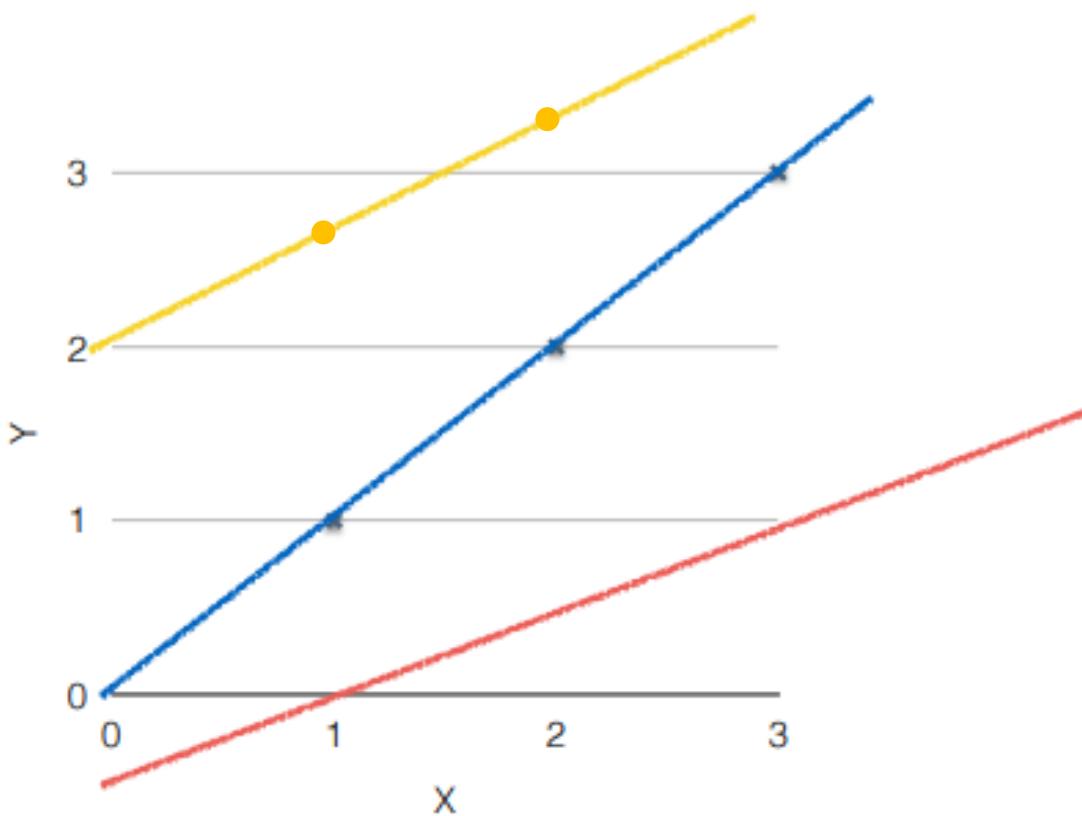


(Linear) Hypothesis

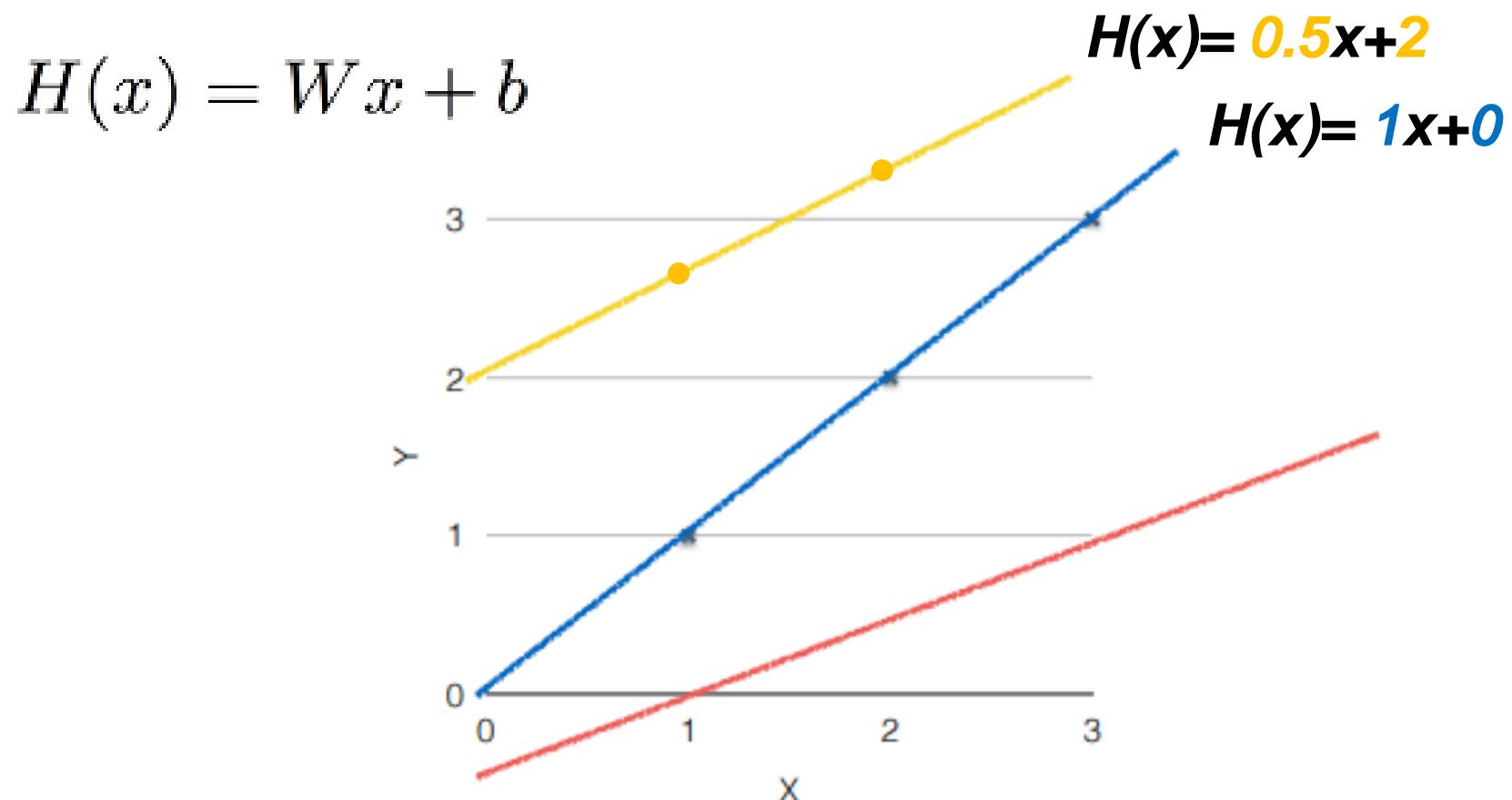


(Linear) Hypothesis

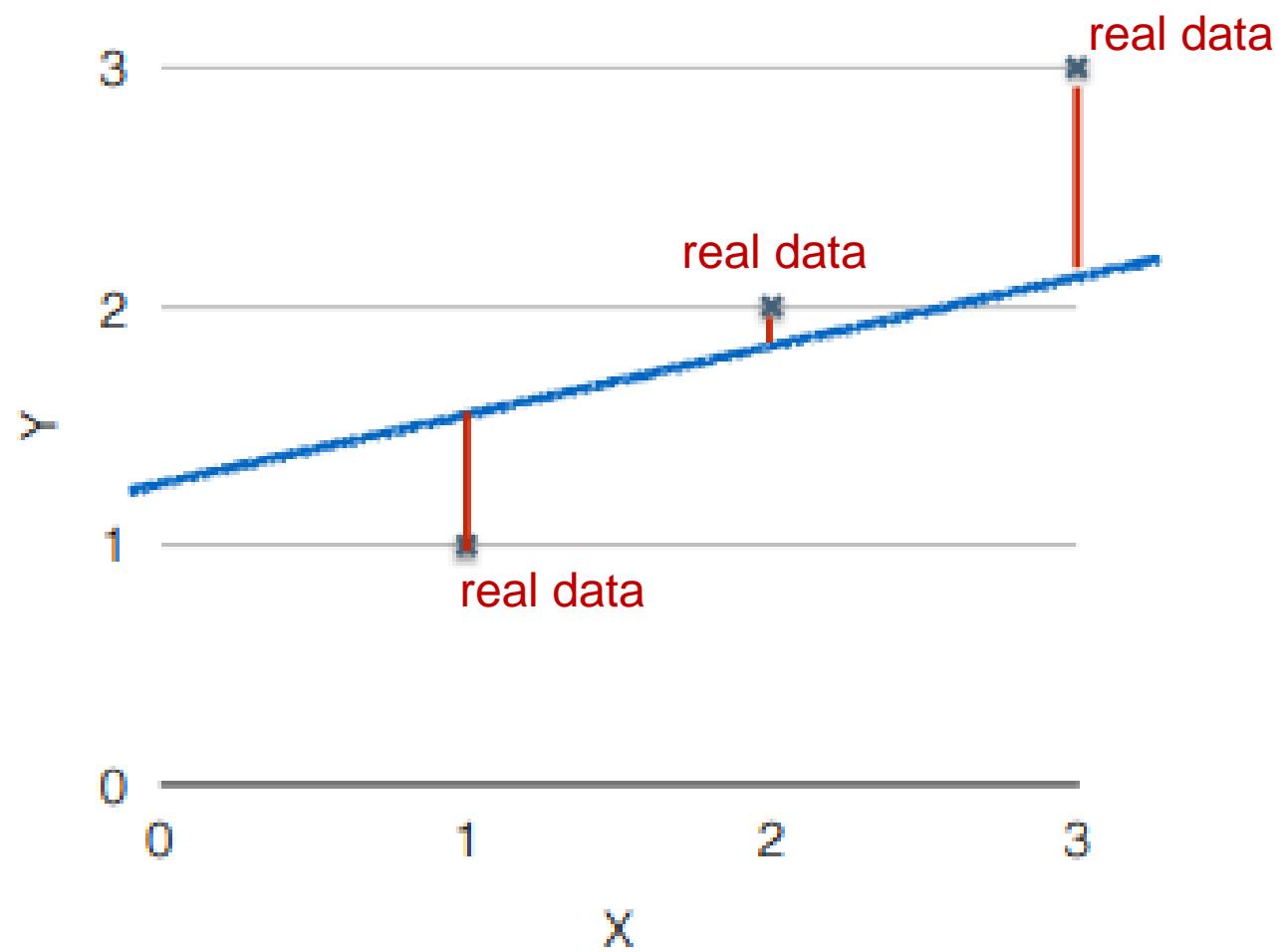
$$H(x) = Wx + b$$



Which hypothesis is better ?



Which hypothesis is better ?



Cost function

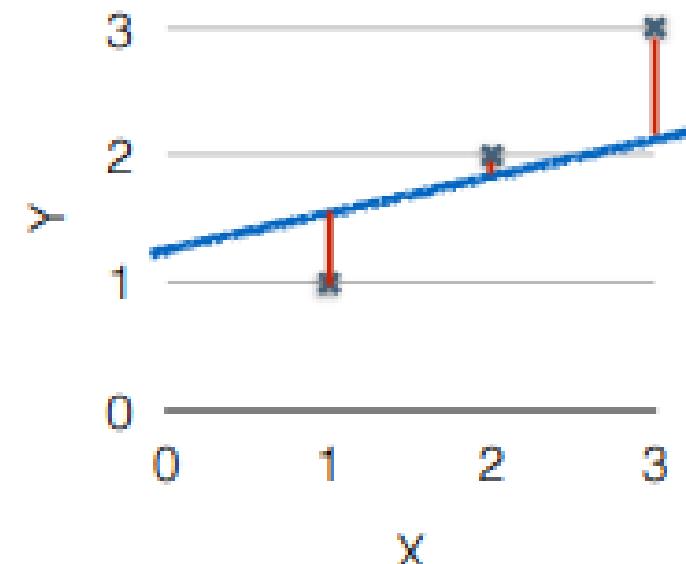
- How fit the line to our (training) data

$$H(x) - y$$

$$\rightarrow (H(x) - y)^2$$

- 제곱의 의미
 - ✓ 양수로 표현
 - ✓ 제곱으로 인해 차이가 크면 오차값이 더 커지고, 차이가 작으면 오차값이 상대적으로 작아지므로 차이를 작게 만들 수 있는 중요한 역할을 할 수 있다.

$$H(x) = Wx + b$$



Cost function

- How fit the line to our (training) data

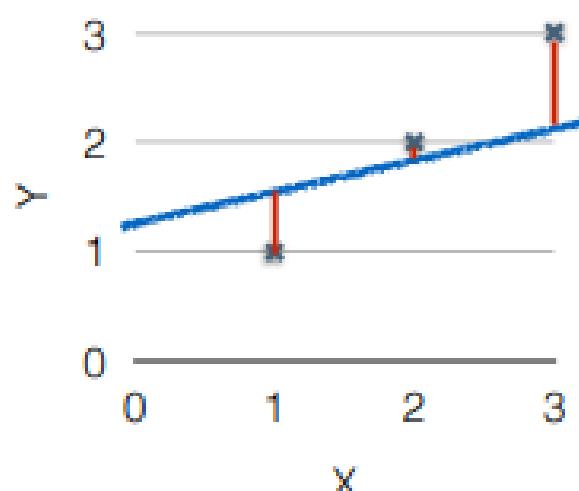
$$\frac{(H(x^{(1)}) - y^{(1)})^2 + (H(x^{(2)}) - y^{(2)})^2 + (H(x^{(3)}) - y^{(3)})^2}{3}$$

y : true value

$$cost = \frac{1}{m} \sum_{i=1}^m (H(x^{(i)}) - y^{(i)})^2$$

m : learning data (training set)의 개수

$$H(x) = Wx + b$$



Cost function

$$cost = \frac{1}{m} \sum_{i=1}^m (H(x^{(i)}) - y^{(i)})^2$$

$$H(x) = Wx + b$$

linear regression의 학습은
가장 작은 차분값을 갖도록 W 와 b 의 값을
구하는 것이다.

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

Goal : Minimize cost

$$\underset{W,b}{\text{minimize}} \ cost(W, b)$$