ML in Python

Learn Machine Learning with Microsoft Azure ML Studio

Microsoft Student Partner
백진헌

CNTK, TensorFlow, Keras, ···

왜 프레임워크를 사용하지 않나요?

ML in Python

1. Linear Regression
(Boston 집값 예측, Boston housing price data set)

2. Logistic Regression
(필기체 숫자 학습 분류 모델, MNIST data set)

3. Neural-network
(필기체 숫자 학습 Deep-learning 모델, MNIST data set)

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Linear Regression

$$Y = (w1*x1) + (w2*x2) + \cdots + (wn*xn)$$

Linear Regression

$$Y = (w1*x1) + (w2*x2) + \cdots + (wn*xn) + b$$

x1, x2, ···, xn : Y를 예측할 때 필요한 유의미한 피처
w1, w2, ···, wn, b : Y를 예측할 때 사용되는 각 피처에 대한 무게 값
Y : 학습된 모델을 통해 예측한 값

Linear Regression

$$Y = (w1*x1) + (w2*x2) + \cdots + (wn*xn) + b$$

그럼 우리가 학습을 통해 계산해야 하는 것은?

Linear Regression

$$Y_{(predict)} = (w1*x1) + (w2*x2) + \cdots + (wn*xn) + b$$

Linear Regression

$$Y_{(predict)} = (w1*x1) + (w2*x2) + \cdots + (wn*xn) + b$$

$$(Y - Y_{(predict)}) \wedge 2$$

Linear Regression

$$Y_{(predict)} = (w1*x1) + (w2*x2) + \cdots + (wn*xn) + b$$

$$\text{Cost Function} : (Y - Y_{(predict)}) \text{ ^ } 2$$

Linear Regression

$$Y_{(predict)} = (w1*x1) + (w2*x2) + \cdots + (wn*xn) + b$$

Cost Function – Low : 더 적게 학습

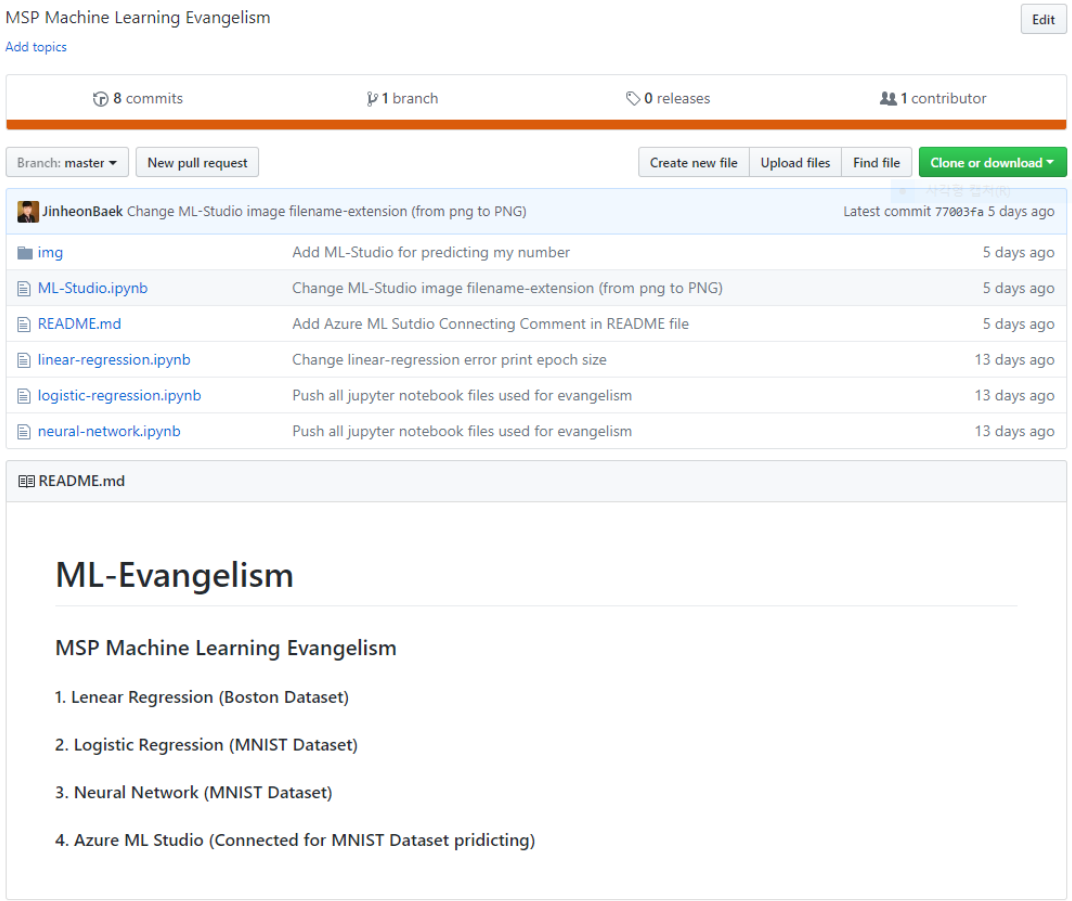
Cost Function – High : 더 많이 학습

Linear Regression

우리가 도움말을 보지 않고 스마트폰을 사용하듯이,
Machine Leaning 잘 모르겠지만 일단 해보자.

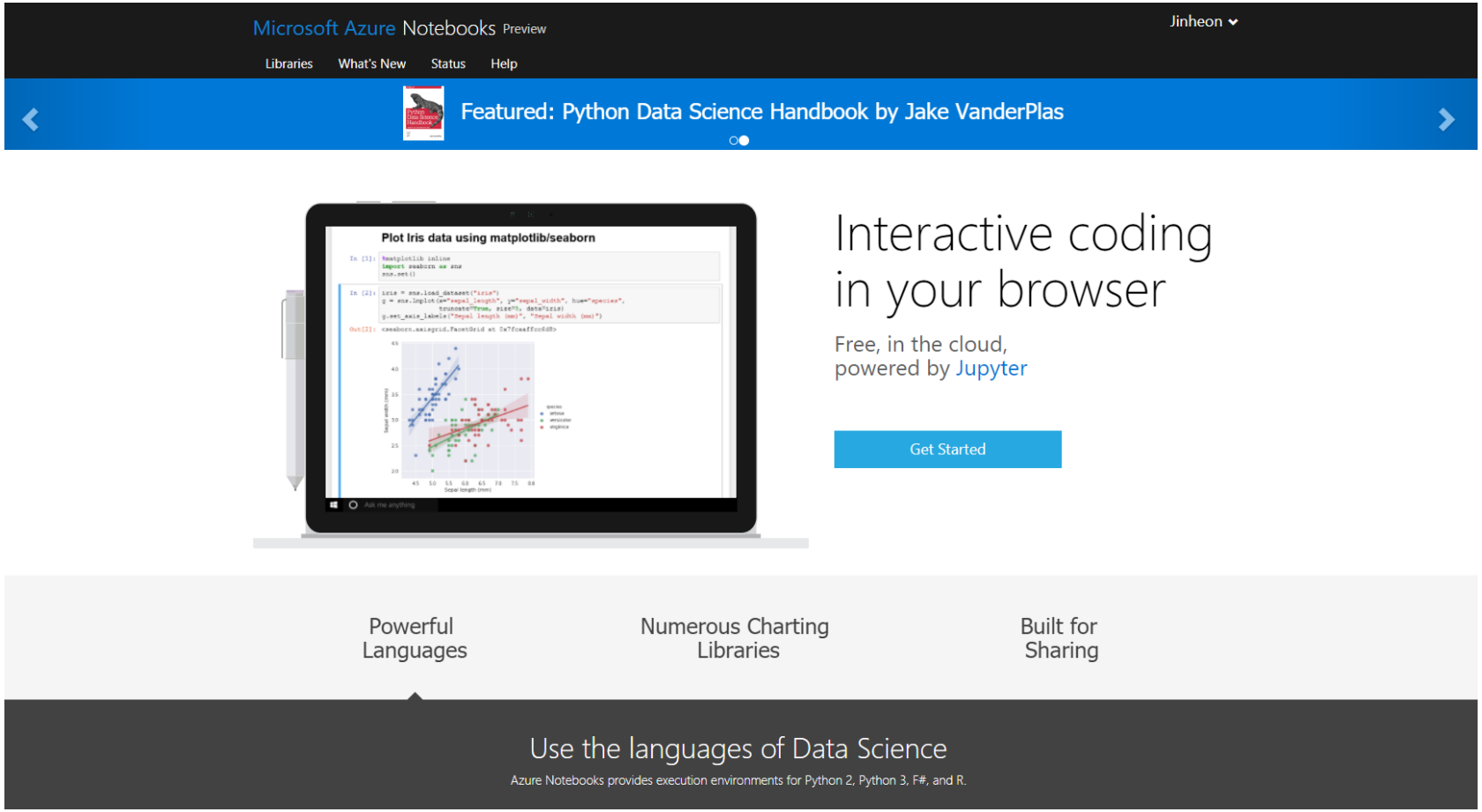
Linear Regression

https://github.com/JinheonBaek/ML-Evangelism



Linear Regression

https://notebooks.azure.com/



Linear Regression

1. Login
2. Libraries 메뉴
3. New Library
4. From Github
5. JinheonBaek/ML-Evangelism (GitHub repository)
6. Import
7. Linear-regression.ipynb

다 함께 해봅시다.

Linear Regression 설명

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Logistic Regression

$$Y = (w1*x1) + (w2*x2) + \cdots + (wn*xn)$$

Logistic Regression

개 : 0 / 고양이 : 1

$$Y = (w1*x1) + (w2*x2) + \cdots + (wn*xn)$$

Logistic Regression

개 : 0 / 고양이 : 1

$$Y = (w1*x1) + (w2*x2) + \cdots + (wn*xn)$$

Y 〉 0 : True

Y 〈 0 : False

Logistic Regression

Cost Function ???

Logistic Regression

개 : 0 / 고양이 : 1

$$Y = (w1*x1) + (w2*x2) + \cdots + (wn*xn)$$

Sigmoid(Y) 〉 0.5 : True

Sigmoid(Y) 〈 0.5 : False

Logistic Regression

개 : 0 / 고양이 : 1

$$Y = (w1*x1) + (w2*x2) + \cdots + (wn*xn)$$

Sigmoid(Y) 〉 0.5 : True
Sigmoid(Y) 〈 0.5 : False

Cost Function : 1(고양이) – Sigmoid(Y) (이런느낌)

Logistic Regression

$$Y1 = (w11*x1) + (w12*x2) + \cdots + (w1n*xn)$$
$$Y2 = (w21*x1) + (w22*x2) + \cdots + (w2n*xn)$$
$$\cdots$$
$$Yn = (wn1*x1) + (wn2*x2) + \cdots + (wnn*xn)$$

Logistic Regression

$$Y1 = (w11*x1) + (w12*x2) + \cdots + (w1n*xn)$$
$$Y2 = (w21*x1) + (w22*x2) + \cdots + (w2n*xn)$$
$$\cdots$$
$$Yn = (wn1*x1) + (wn2*x2) + \cdots + (wnn*xn)$$

$$Max\ (\ y_{(1 \sim n)}\ ) = y3\ ?$$

Logistic Regression

$$Y1 = (w11*x1) + (w12*x2) + \cdots + (w1n*xn)$$
$$Y2 = (w21*x1) + (w22*x2) + \cdots + (w2n*xn)$$
$$\cdots$$
$$Yn = (wn1*x1) + (wn2*x2) + \cdots + (wnn*xn)$$

$$Max\ (\ Sigmoid(y_{(1 \sim n)})\ ) = y3\ ?$$

MNIST data set ?

Logistic Regression

28 x 28, 필기체 숫자 (0 ~ 9)

Logistic Regression

$$Y0 = (w11*x1) + (w12*x2) + \cdots + (w1n*xn)$$
$$Y1 = (w21*x1) + (w22*x2) + \cdots + (w2n*xn)$$
$$\cdots$$
$$Y9 = (wn1*x1) + (wn2*x2) + \cdots + (wnn*xn)$$

다 함께 해봅시다.

Logistic Regression 설명

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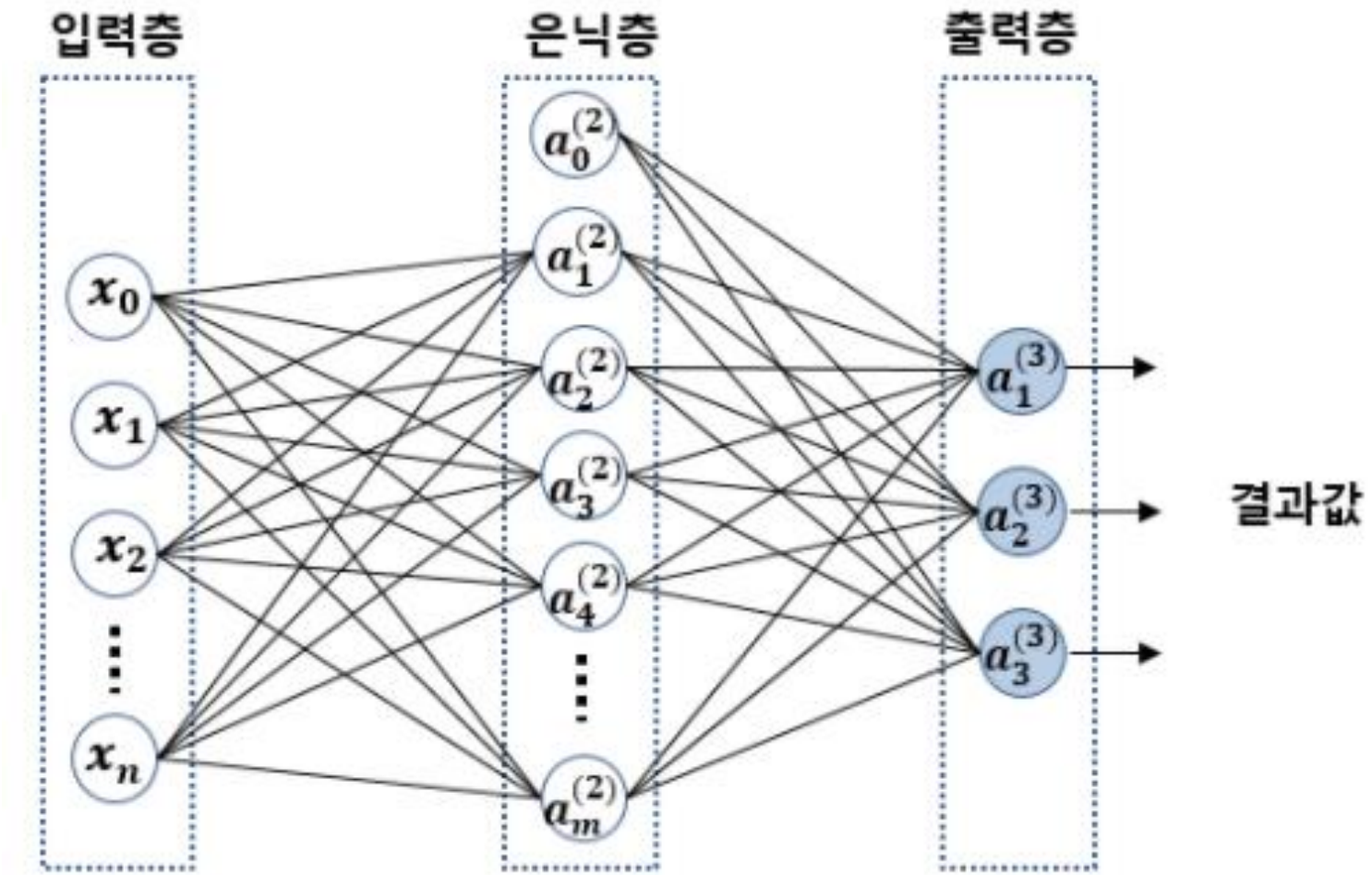
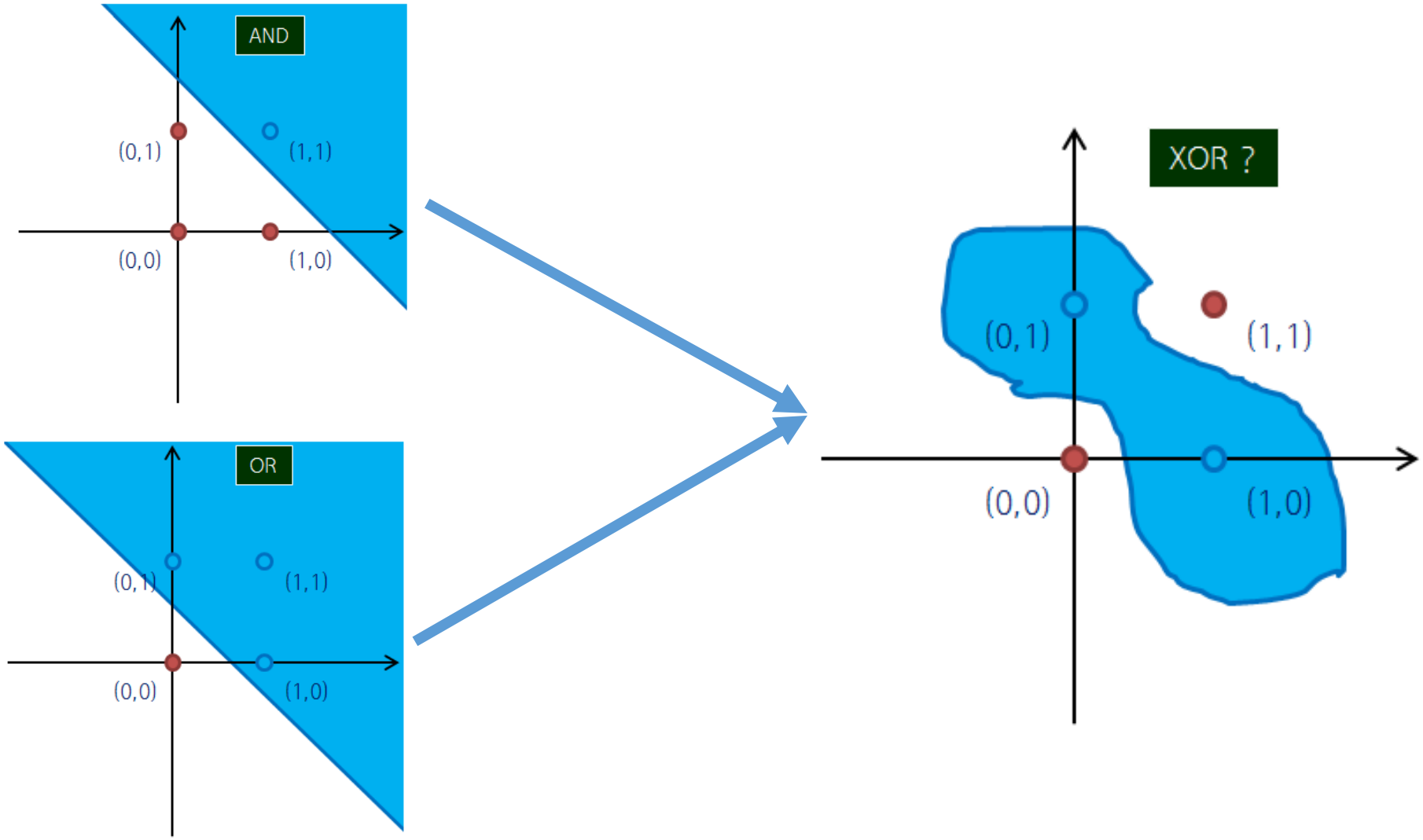
Neural-network 장점

Neural-network

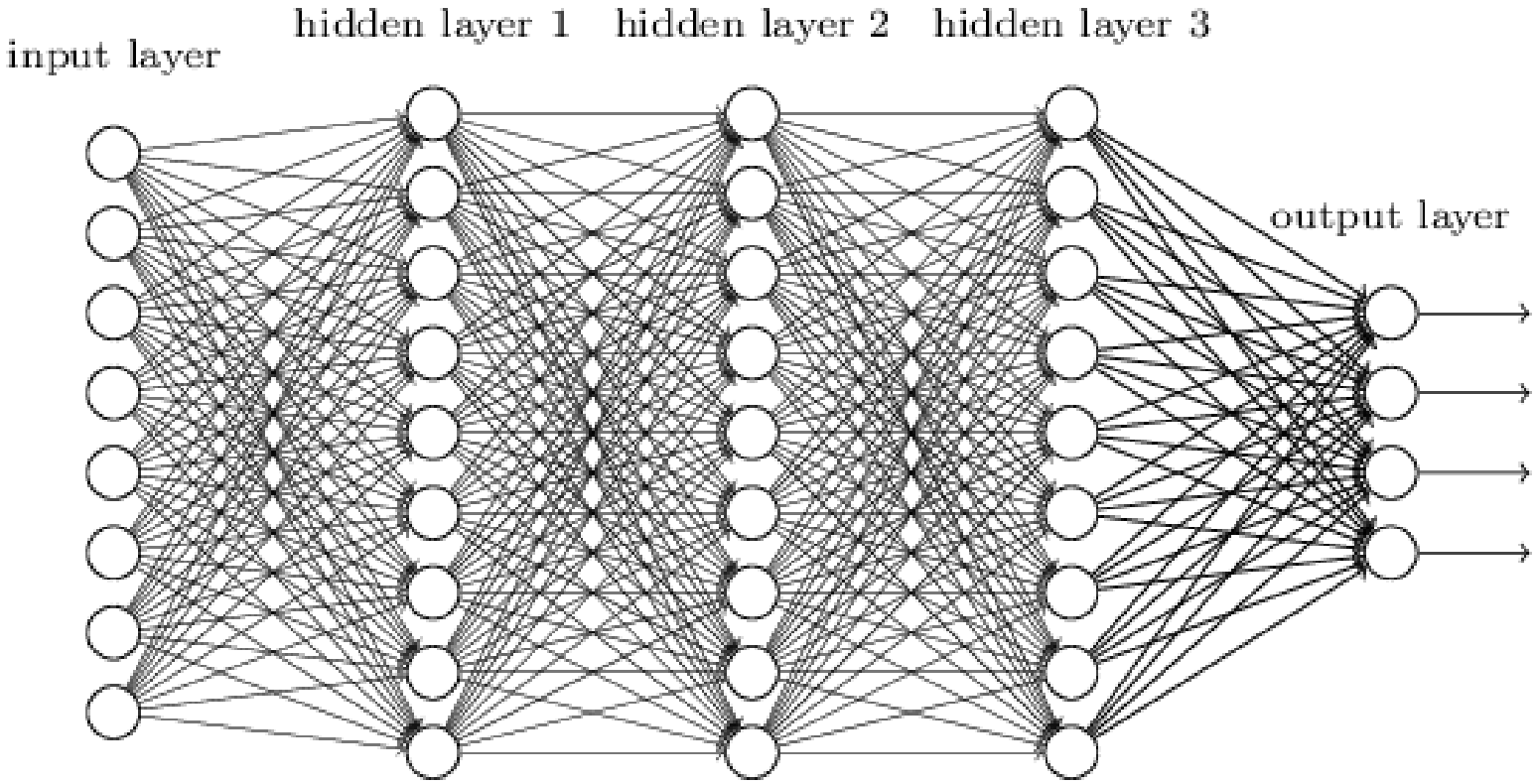


Neural-network

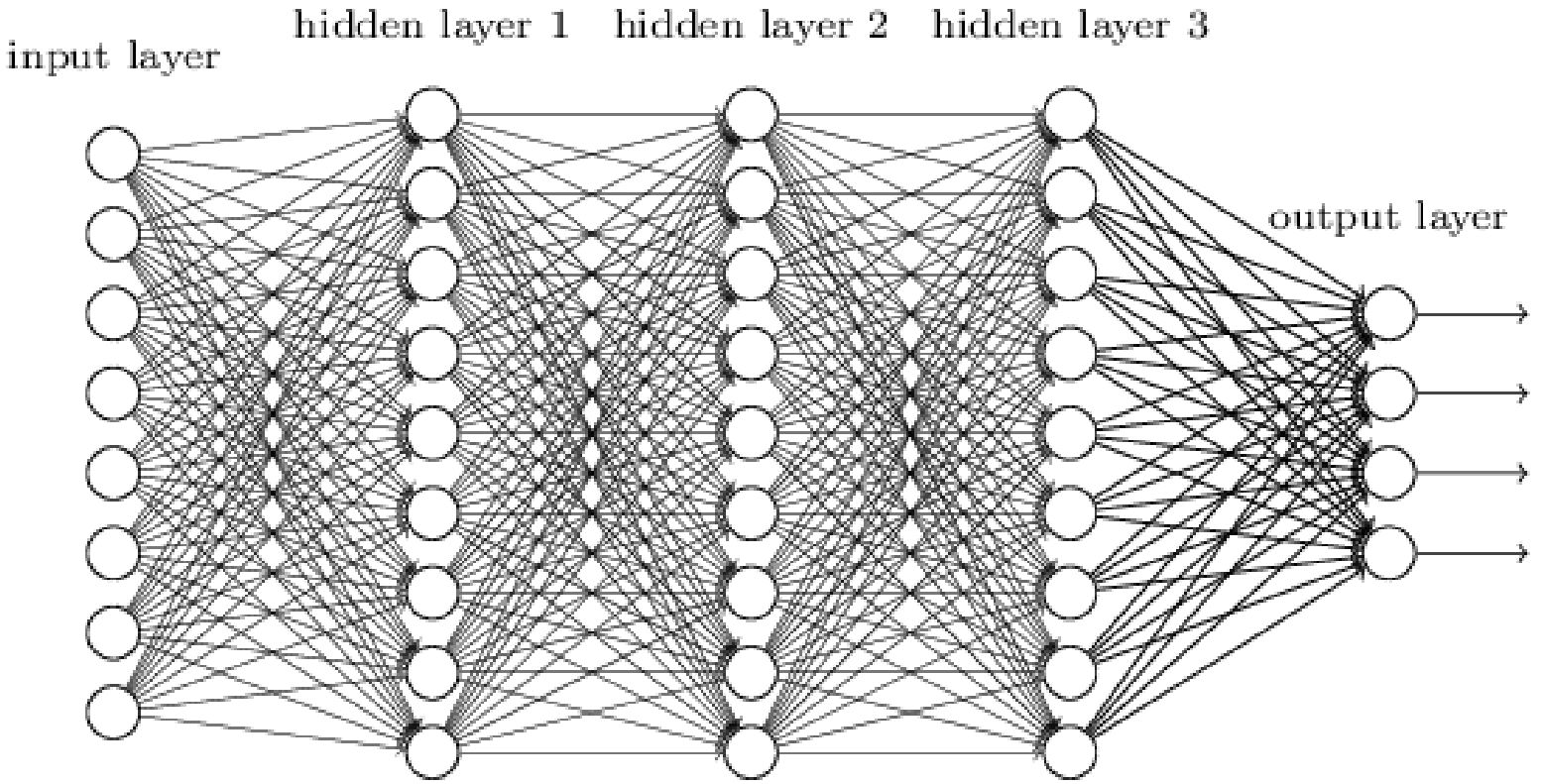


우리가 해야할 일은?

Neural-network

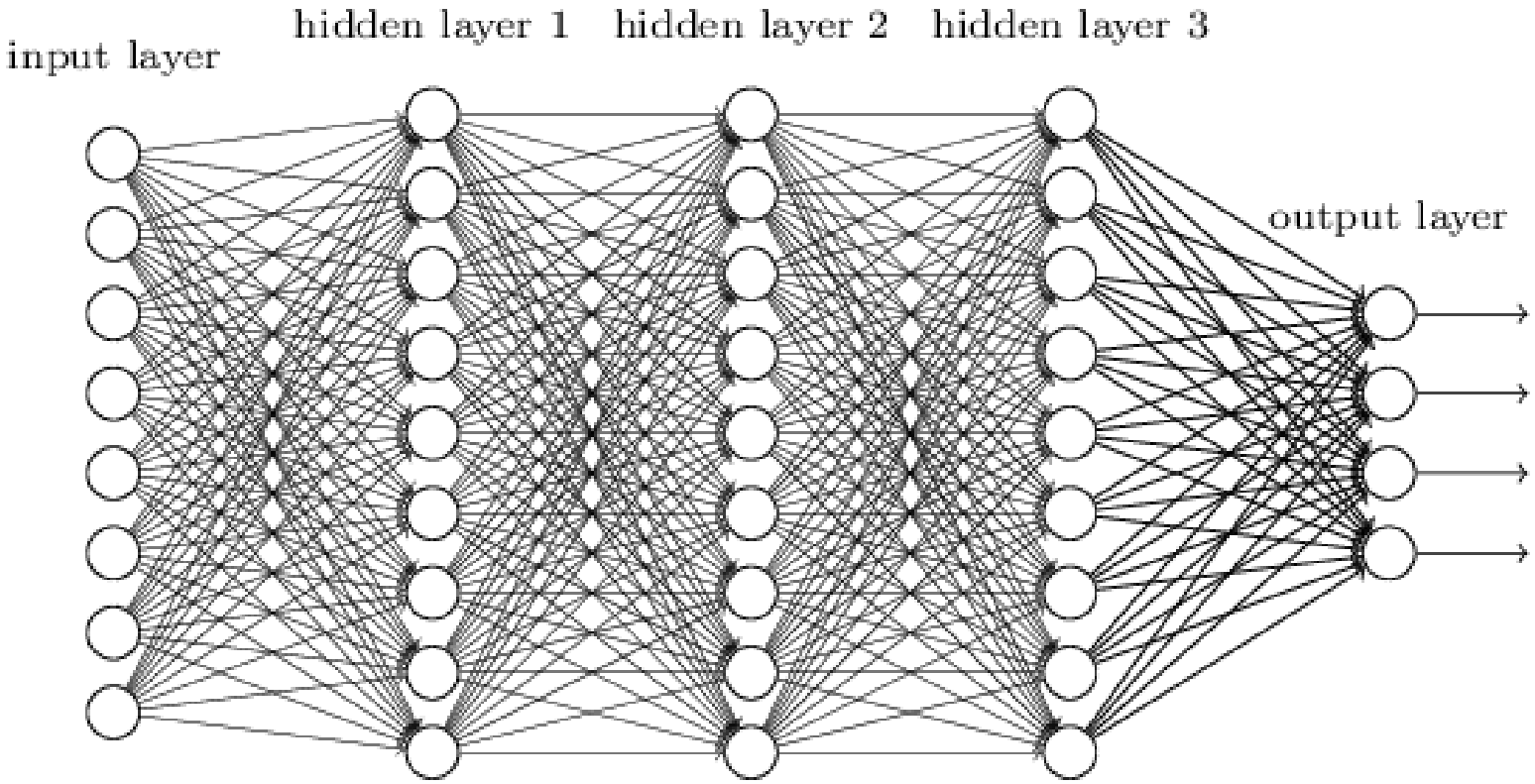


Neural-network



결과 예측

Neural-network



Layer 값 조정

다 함께 해봅시다.

Neural-network 설명

Q & A

감사합니다