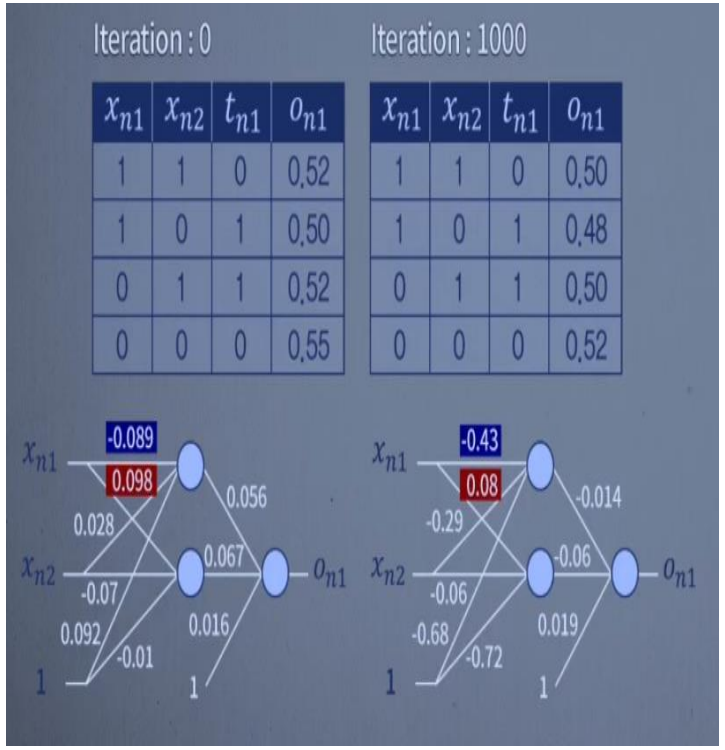
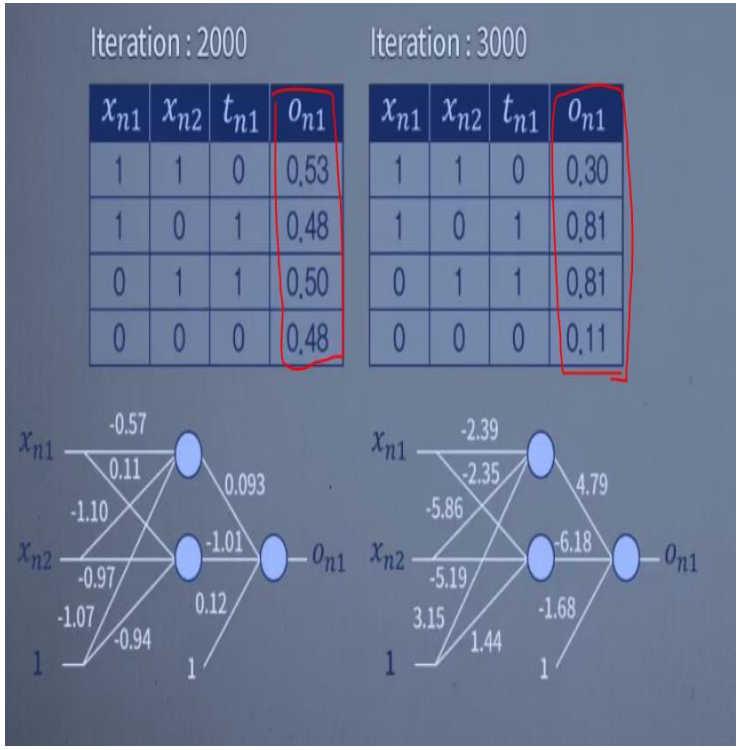
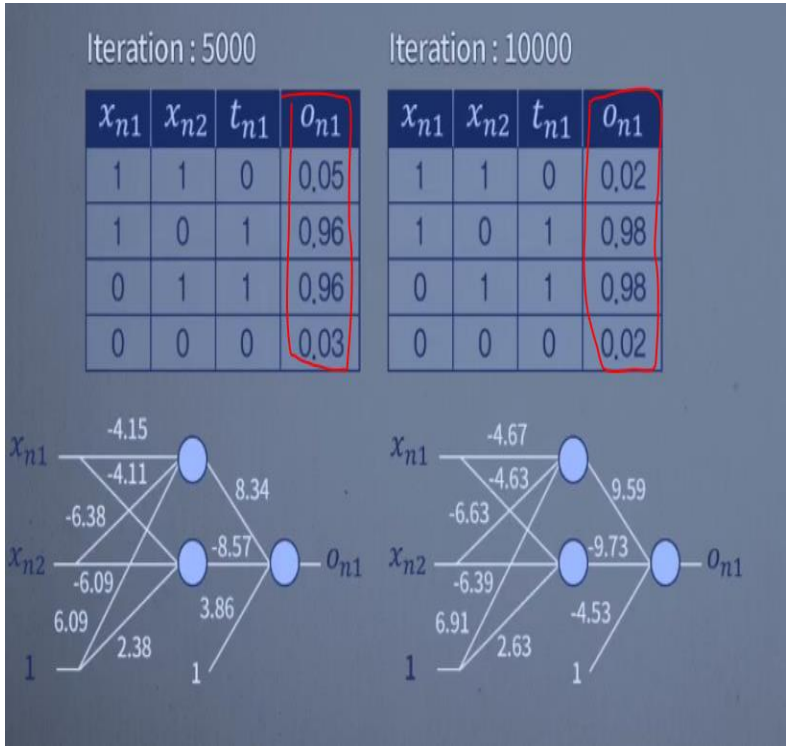
Neural Network3

XOR 학습



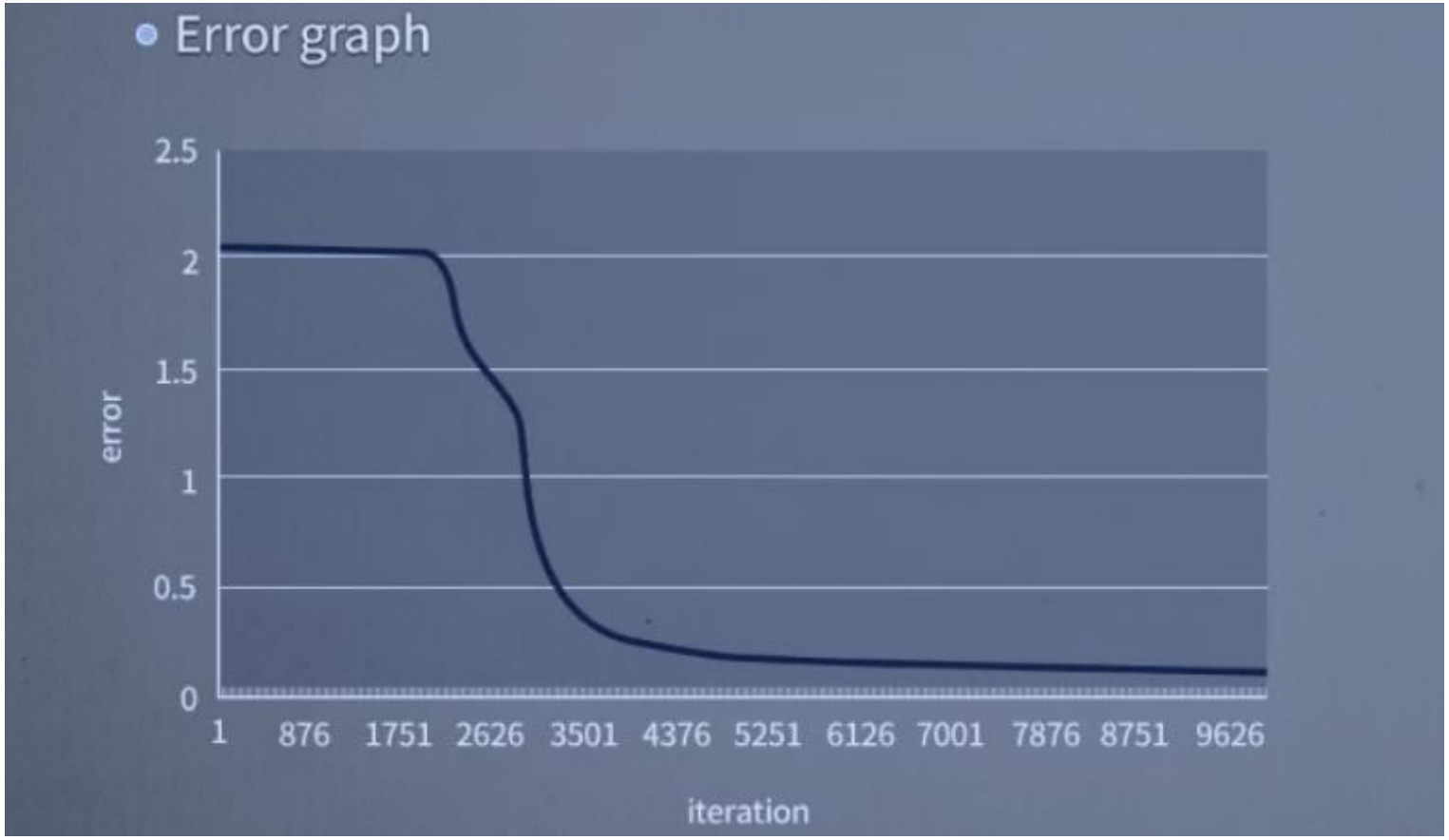
초기 임의
설정된 w





계속 Back Propagation으로 학습시키면 결국 0또는 1로 결과 출력

Error Graph



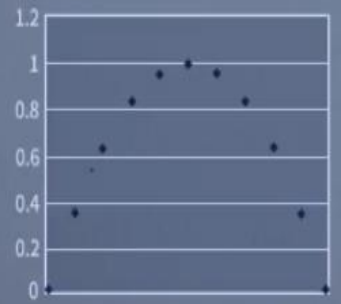
- 학습 시 반드시 관찰
- Error가 감소하는 것을 확인하여 언제까지 학습을 시켜야 하는지 파악

4x*(1-x) 학습

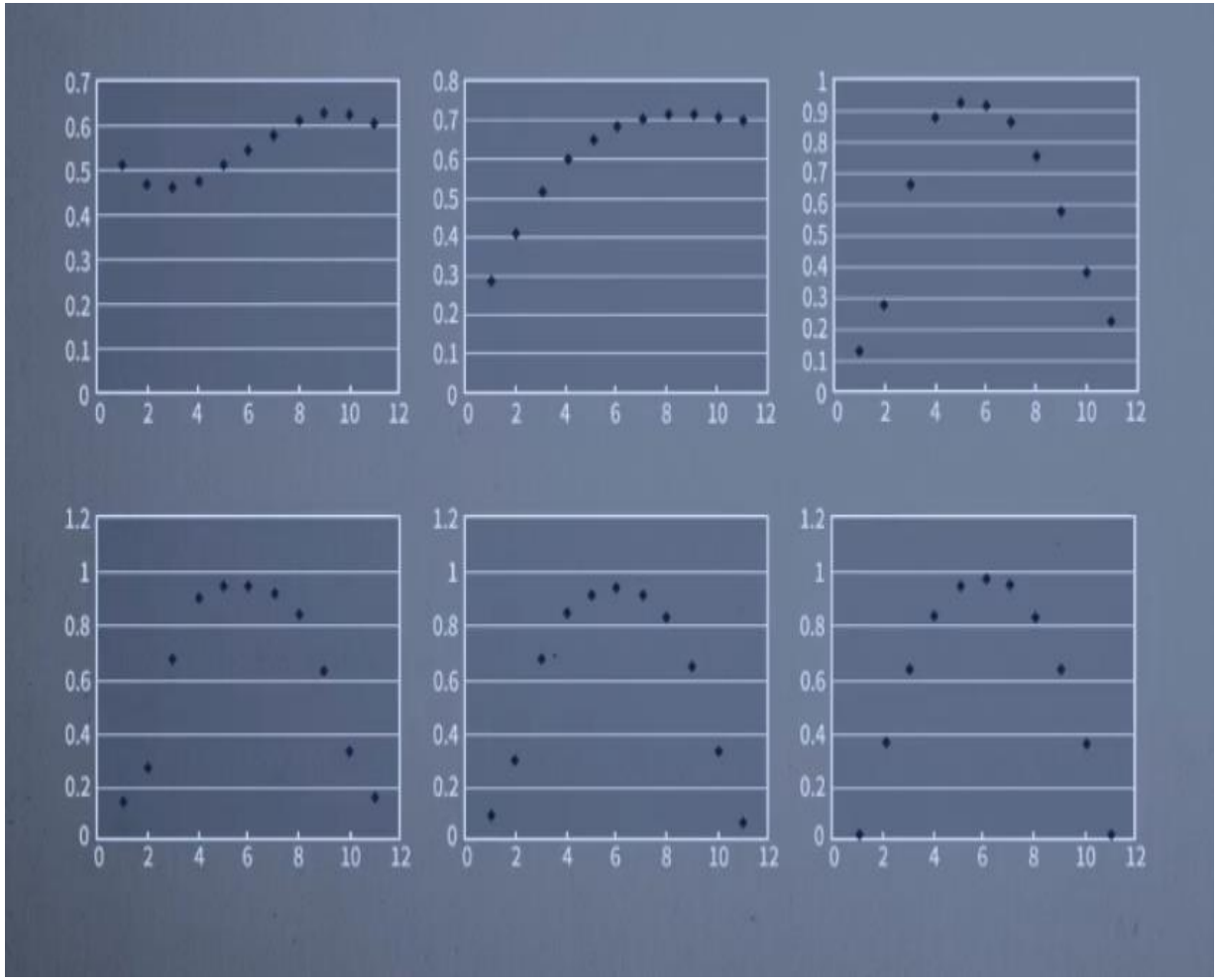
Example2 :

- Hidden nodes : 4
- Iteration : 500,000
- Learning rate : 0.7

$f(x) = 4x*(1-x)$

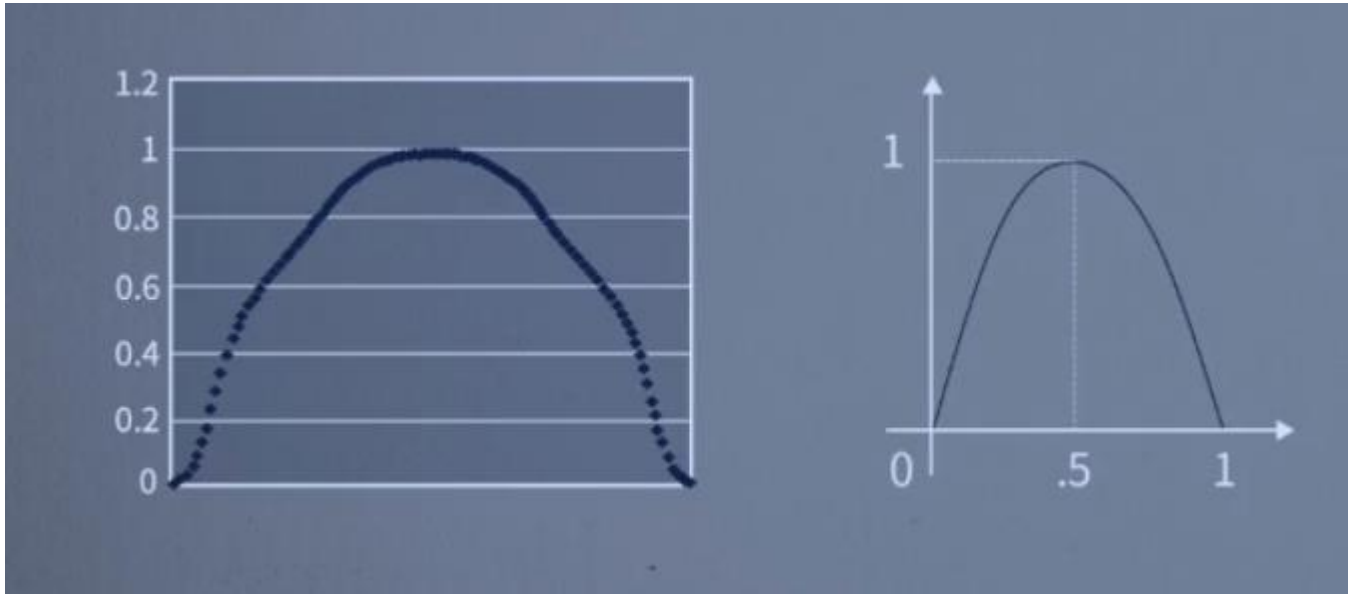


Input	Output
0.00	0.00
0.10	0.36
0.20	0.64
0.30	0.84
0.40	0.96
0.50	1.00
0.60	0.96
0.70	0.84
0.80	0.64
0.90	0.36
1.00	0.00



Un-learned Data

- Training data에 없는 값을 주면 Neural Networks는?



완벽히 일치하진 않지만 자기가 배운 Training data를 일반화하여 값을 내준다.

What is Best?

The simpler is the better

1. Optimal Number of Neurons
- Hidden layer의 neuron 개수가 증가할수록 더 복잡한 함수를 만든다.(복잡한 함수가 나오지 않도록 control)
2. Training Iterations
- 학습이 많이 진행되면 진행될수록 Neural Network 모양이 점점 왜곡될 가능성이 커진다.(적당히 0에 가까울 때 stop)
3. Regularization Technique
4. 많은 Training data 사용하기