인공신경망

마약 복용 여부 파악

https://url.kr/mvpyxr

(무단 배포 환영)

인공지능 꼭 알아야 하나요?

경제 > DBR

[DBR]‘AI 정체성’이 특권 의식 높인다

동아일보 | 업데이트 2023-07-03 03:00

0 0

‘AI 정체성’ 높은 직원일수록
스스로 특별하다고 여겨
비윤리적 행동 막을 대책 필요

목표!

Addicted? OR Not Addicted?

확률 구하기 !

https://url.kr/ll5jvs

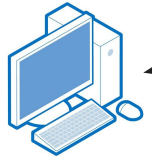
<데이터셋 링크>

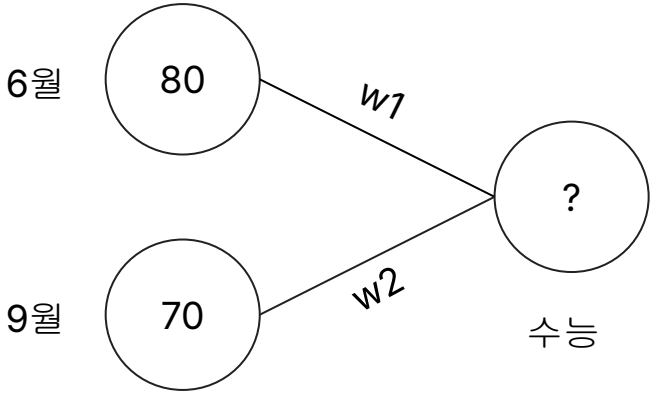
<압축 풀고 본인
드라이브에
추가하세요 !>

머신 러닝?

- 컴퓨터가 명시적인 프로그래밍 없이도 데이터로부터 학습할 수 있도록 하는 알고리즘과 통계 모델의 집합

6월	78	56	83	58
9월	67	70	64	86
수능	80	89	66	68





← 80*w1 + 70*w2 +b < 6, 9월 성적과 관련은 없지만 수능에 반영되는 요소

머신 러닝?

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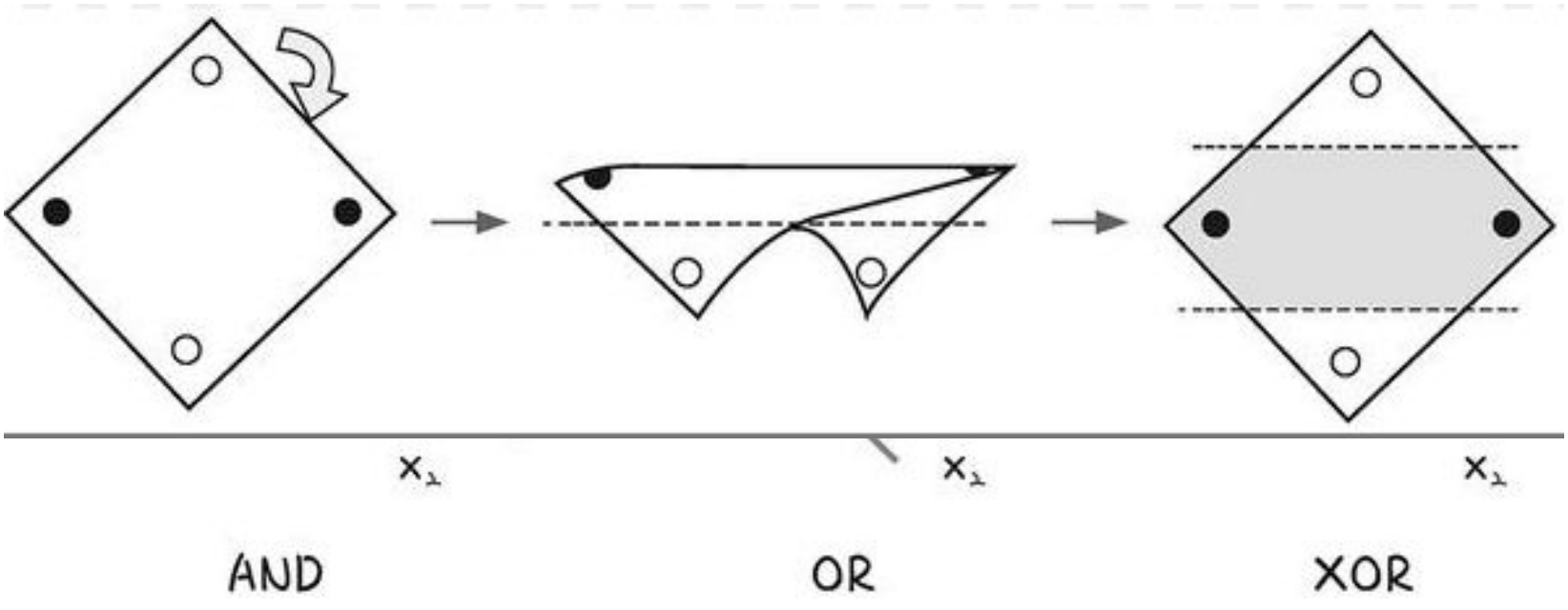
6월	78	56	83	58
9월	67	70	64	86
능		89	66	68

결국 예측을 잘 할 수 있는 하나의 직선을 찾는것이 목표!!

+b < 6, 9월 성적과 관련은 없지만 수능에 반영되는 요소

XOR 문제



인공신경망?, 딥러닝?

딥러닝은 인공신경망(Artificial Neural Network)을 기반으로 한 머신러닝의 한 분야로, **다층 신경망을 사용하여 데이터로부터 추상적인 고차원 특징을 자동으로 학습**함. 딥러닝은 **대규모 데이터와 복잡한 모델을 활용**하여 **이미지 인식**, 자연어 처리 등에서 뛰어난 성능을 보여줌.

- 계층적 특징 학습: 은닉층을 활용한 계층적 학습
- 머신러닝과 달리, 선형적이지 않은 데이터 분류 가능
- 대규모 데이터 요구, 복잡한 모델 구조: 높은 연산력, 복잡

인공신경망?, 딥러닝?

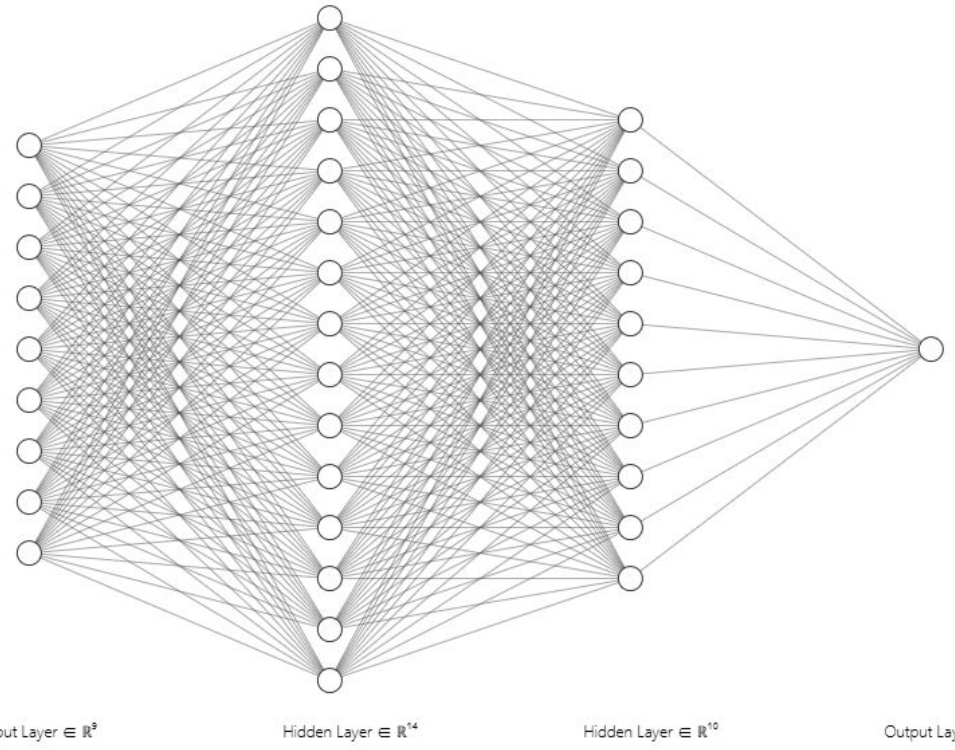
딥러닝은 인 신러닝의

한 분야로, [**원 특징을**

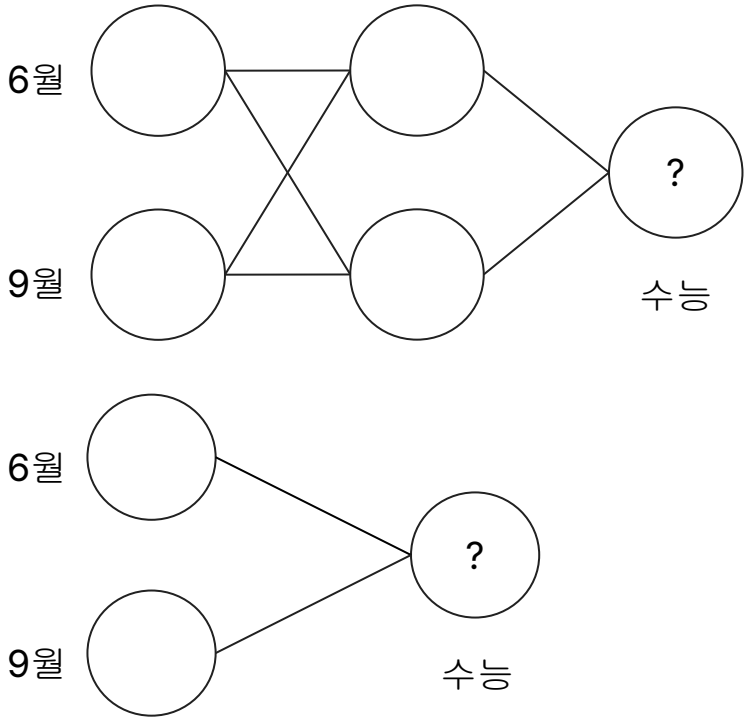
자동으로 학 하여

이미지 인식

- 계층적
- 머신러
- 대규모



Loss, Activation Function?



6월	9월	수능	예측
78	67	80	76
56	70	89	79
83	64	66	62
58	86	68	78

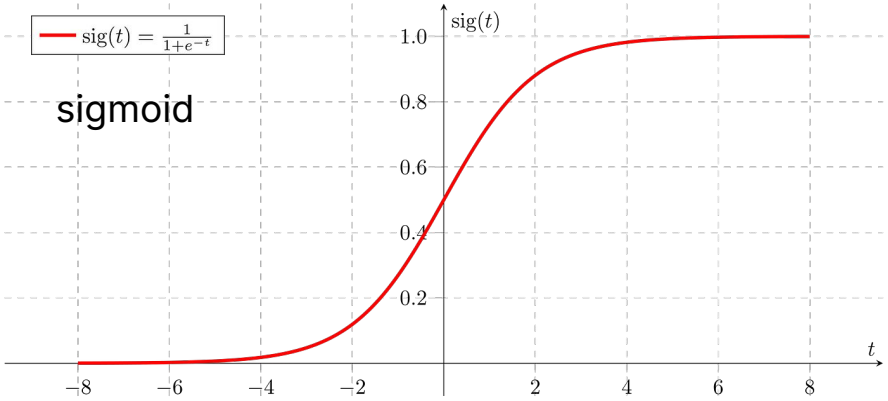
$(1/N) * \Sigma (\hat{y} - y)^2$

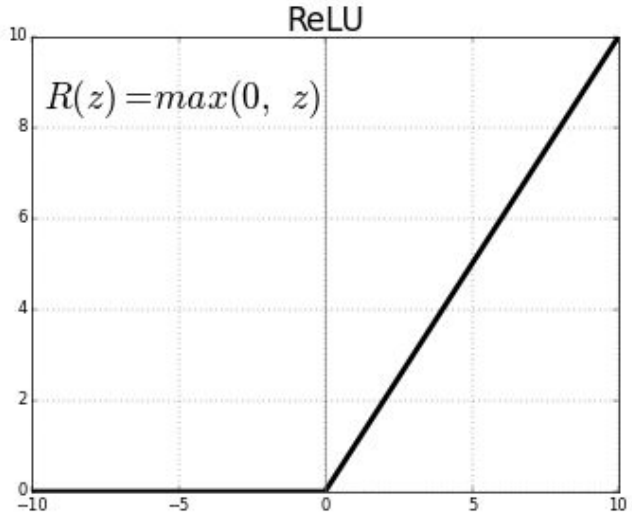
<오차 제곱합 손실 함수>

$- (1/N) * \Sigma \{ y * \log(\hat{y}) + (1 - y) * \log(1 - \hat{y}) \}$

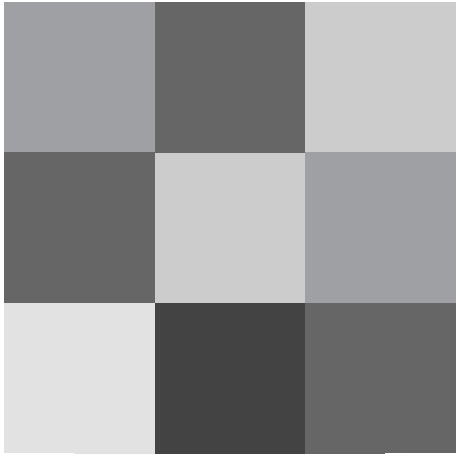
<Binary Cross-Entropy Loss>

Activation Function?

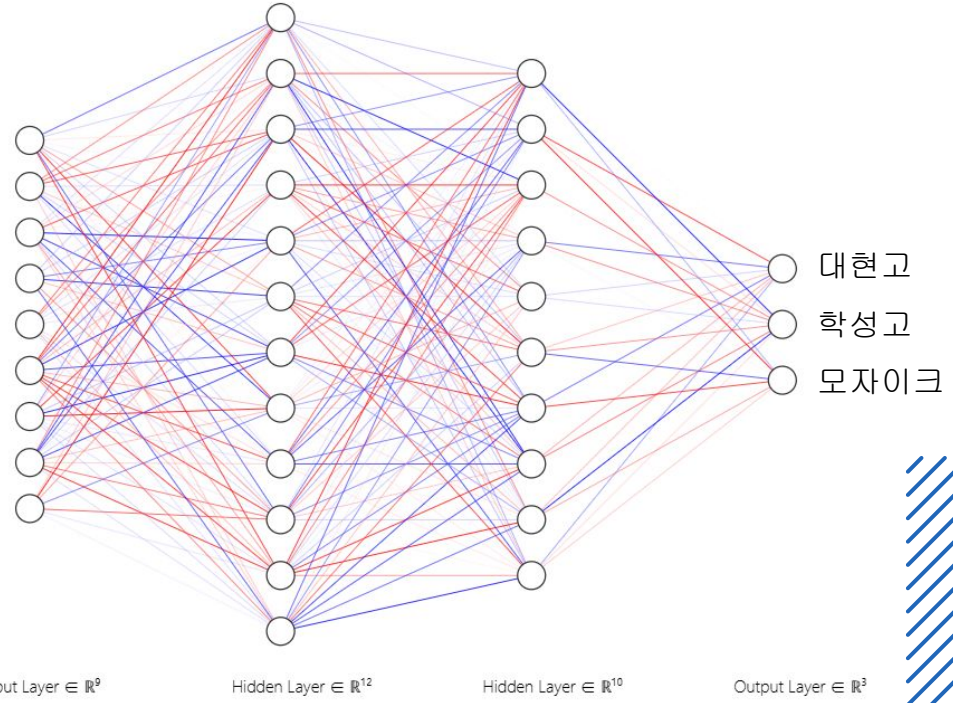




Flatten?

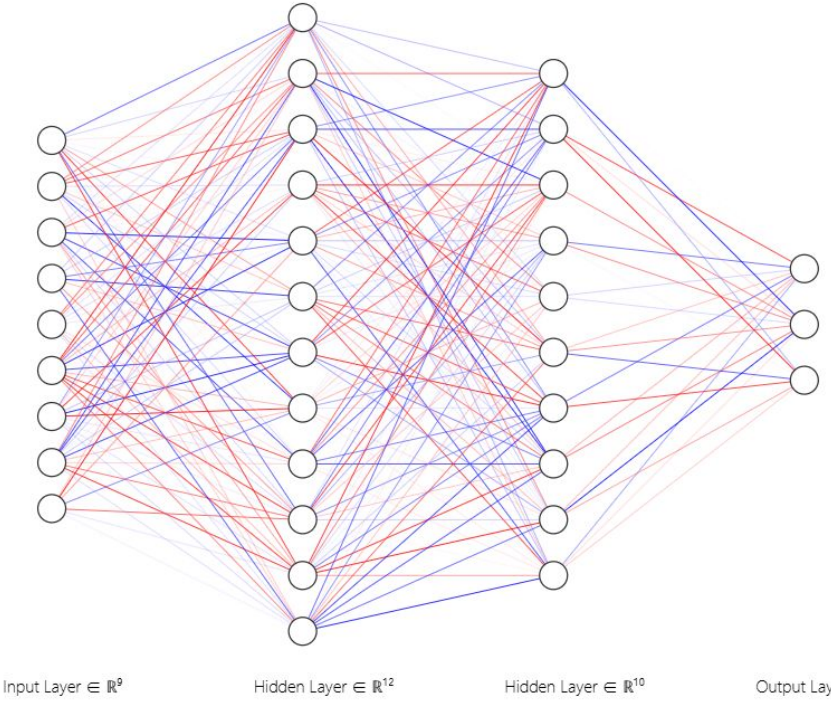


$$\begin{pmatrix} 50 & 25 & 70 \\ 25 & 70 & 50 \\ 75 & 15 & 25 \end{pmatrix}$$

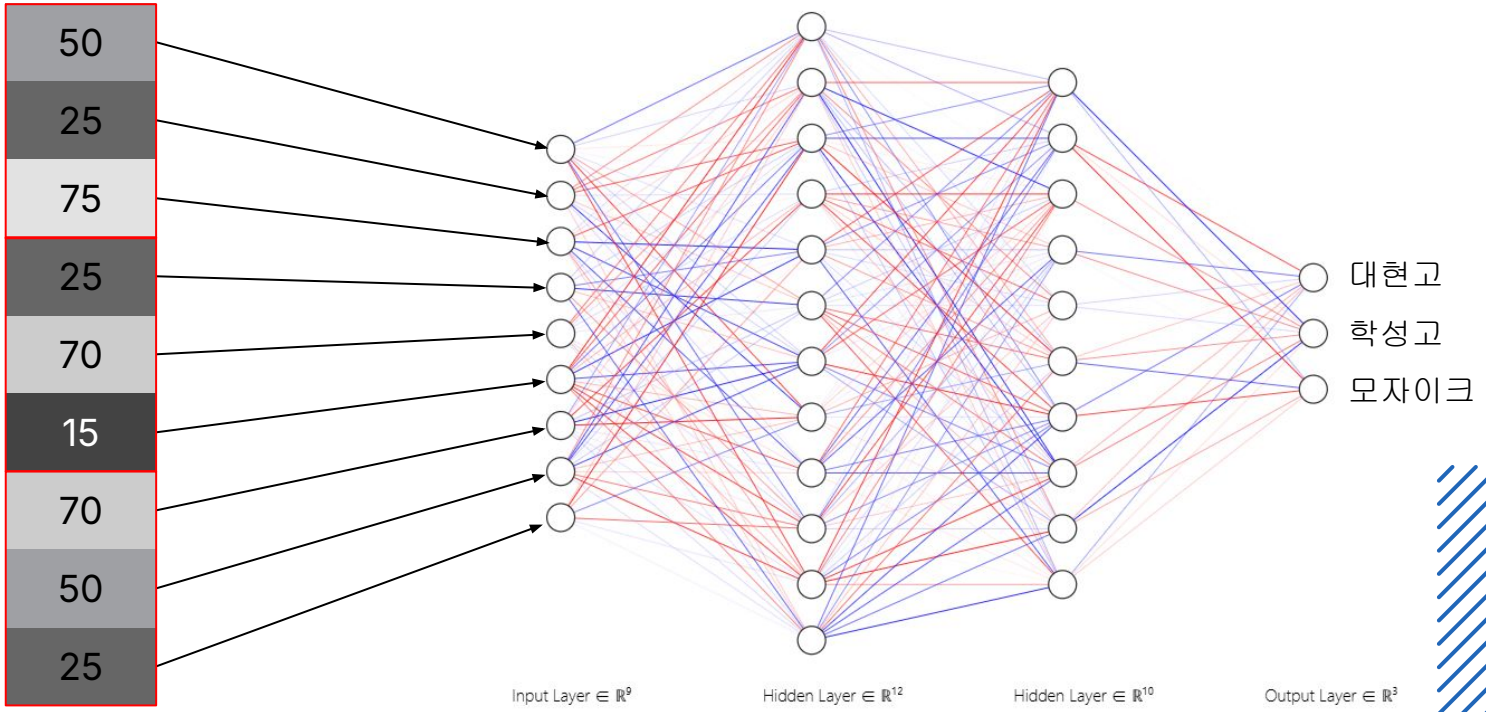


Flatten?

50	25	70
25	70	50
75	15	25



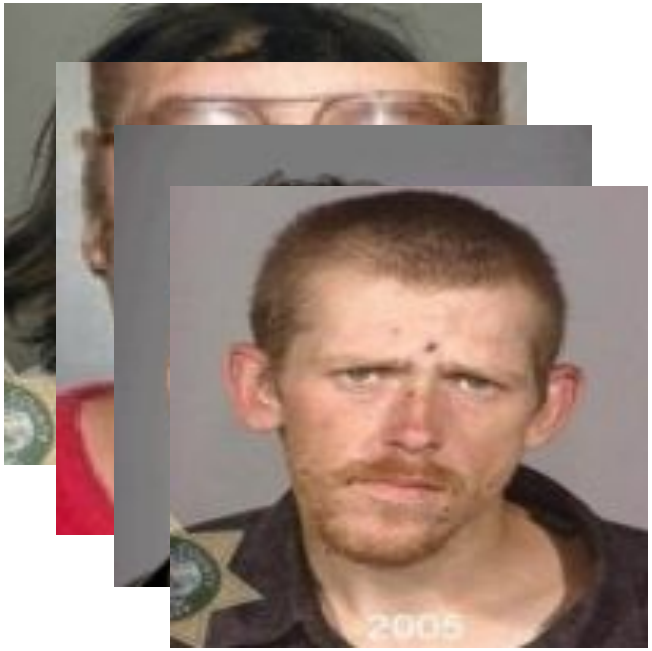
Flatten?


50
25
75
25
70
15
70
50
25
대현고
학성고
모자이크
Input Layer ∈ ℝ⁹
Hidden Layer ∈ ℝ¹²
Hidden Layer ∈ ℝ¹⁰
Output Layer ∈ ℝ³

실습해봅시다!

https://url.kr/cfpi1g

Accuracy? Loss?



목표!

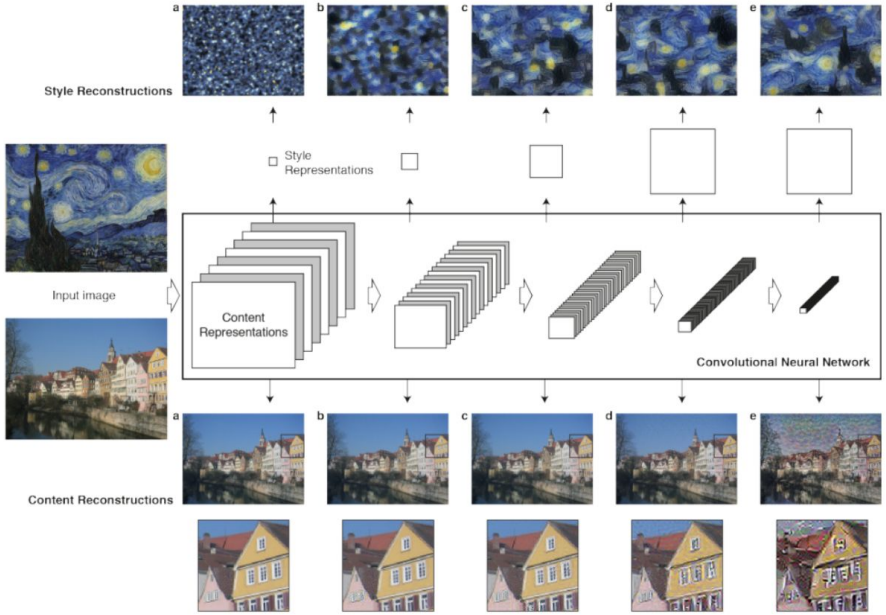
- 이수 조건 : (최종 **Accuracy**) **>** **0.7** 인 모델 제출하기 (마감 : 수업 종료 **15**분전)

- 경쟁 :  ← (**1** - 이 이미지 속 사람이 마약을 복용했을 확률) * (모델의 정확도)의

  값이 가장 높은 모둠이 되기

Convolution Neural Network?

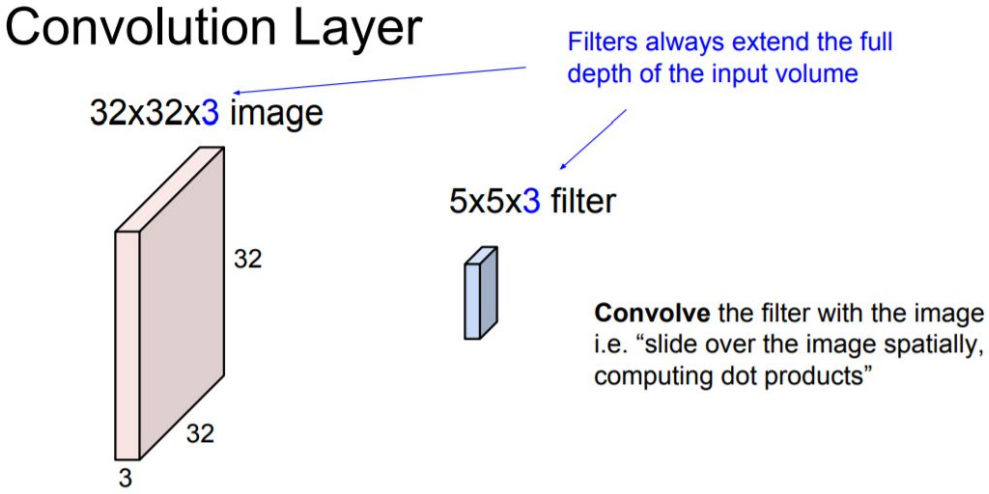
Less content ⟷ More content

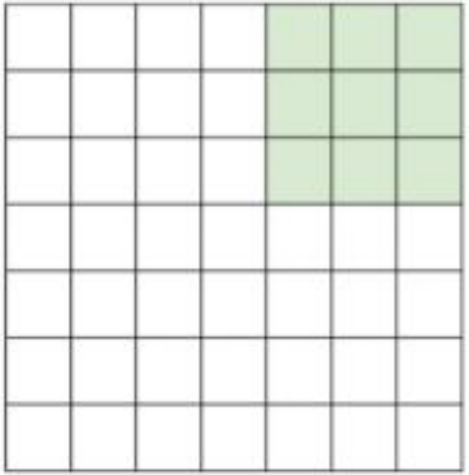


(VGG19 w/o FC layer)

Original ⟷ Reconstructed

Convolution Neural Network?

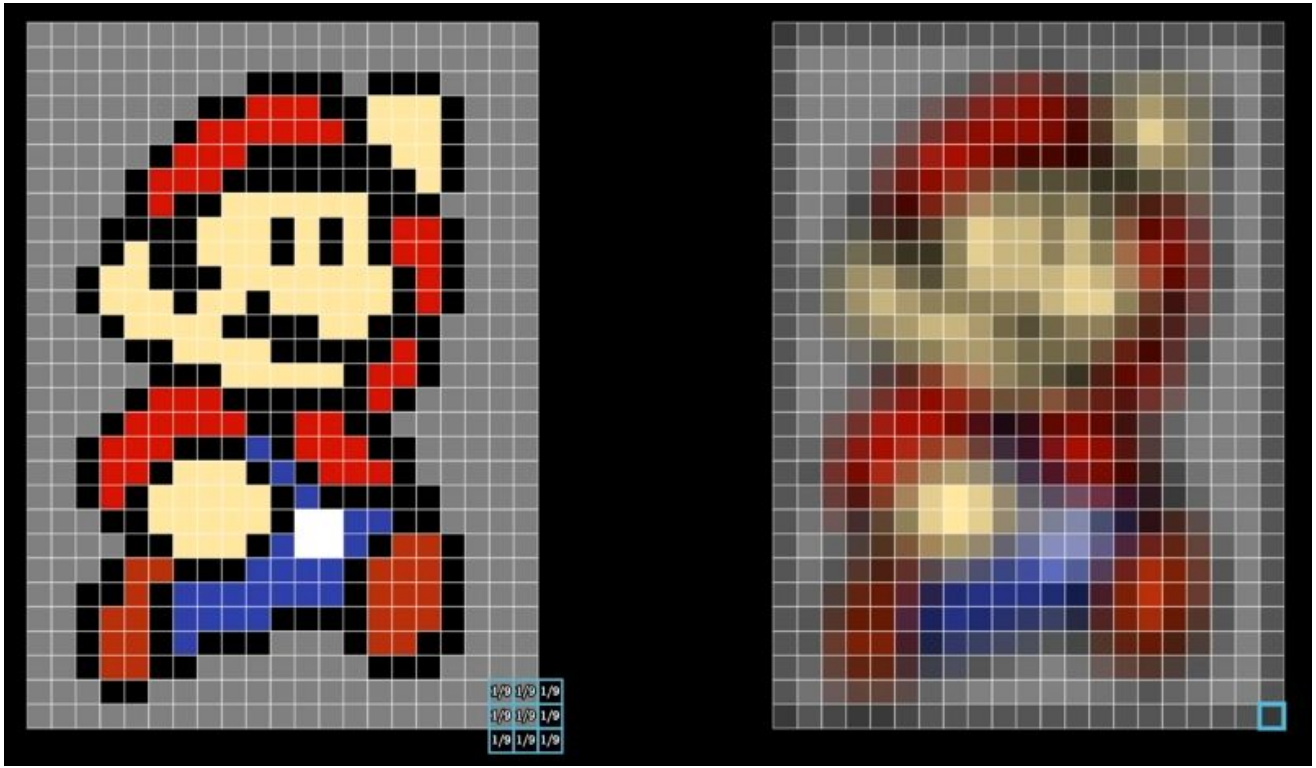




Convolution Neural Network?

Filter

1/9	1/9	1/9
1/9	1/9	1/9
1/9	1/9	1/9



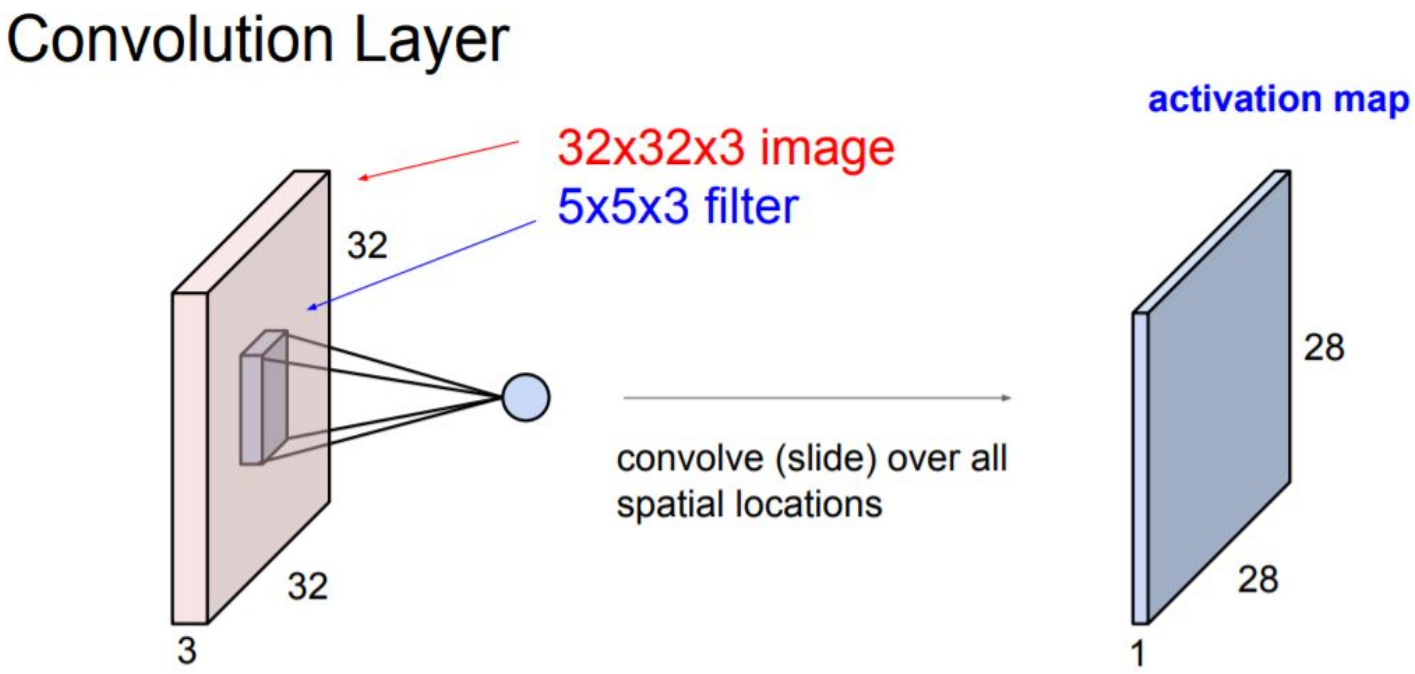
이미지 출처: 3B1B youtube

Convolution Neural Network?

Filter

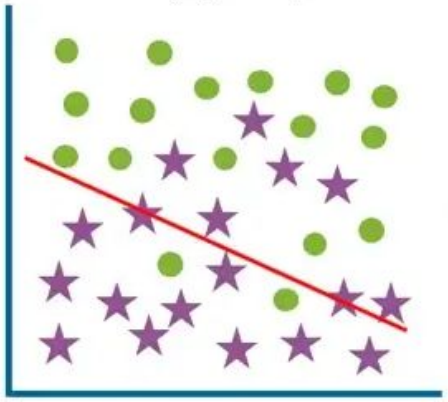
-1	-1	-1
-1	8	-1
-1	-1	-1

Convolution Neural Network?

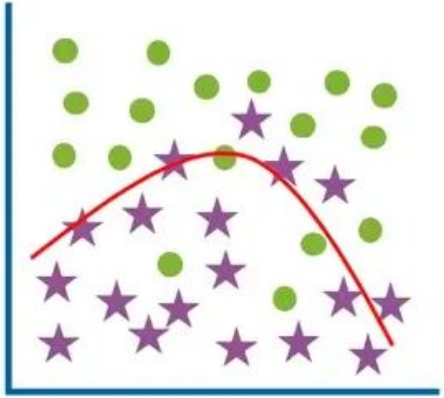


Overfitting?

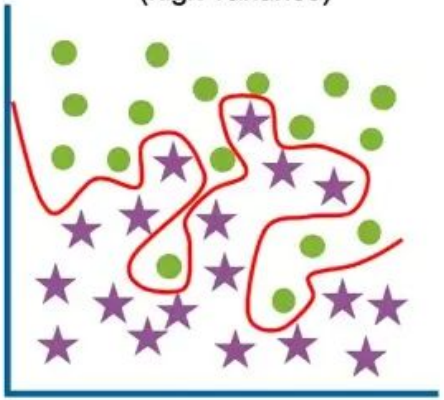
중요!



High training error
High test error

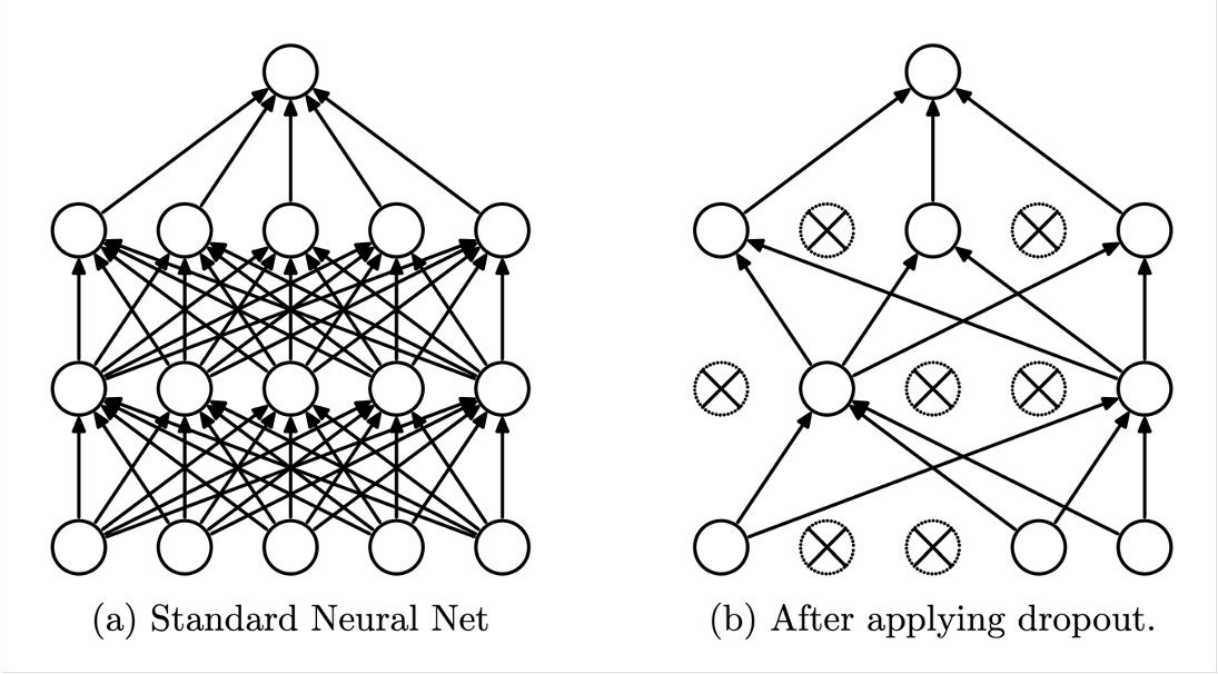


Low training error
Low test error



Low training error
High test error

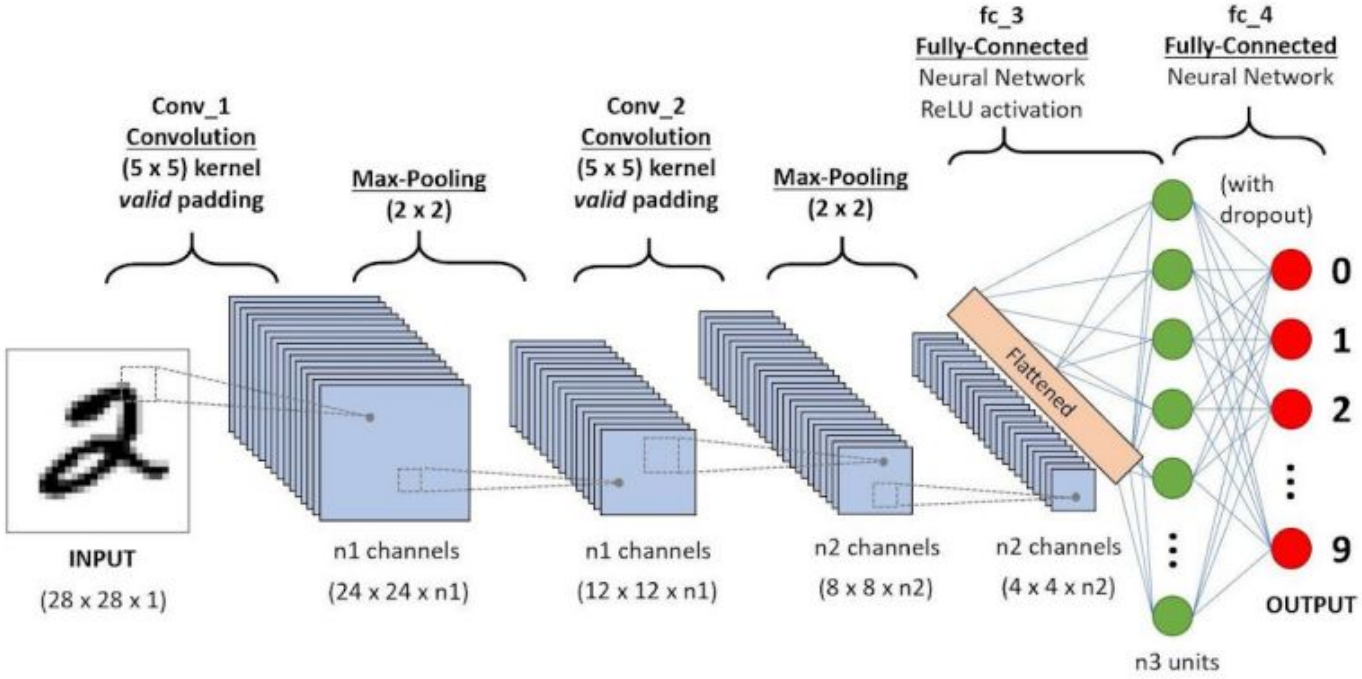
Dropout, Pooling?



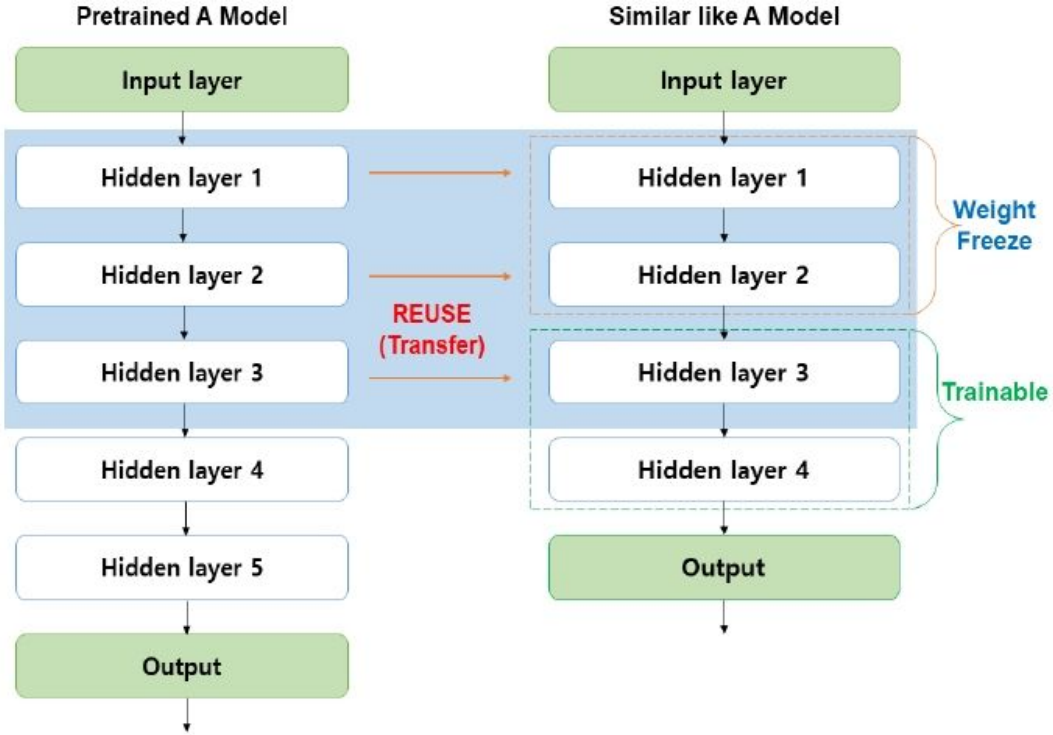
(a) Standard Neural Net

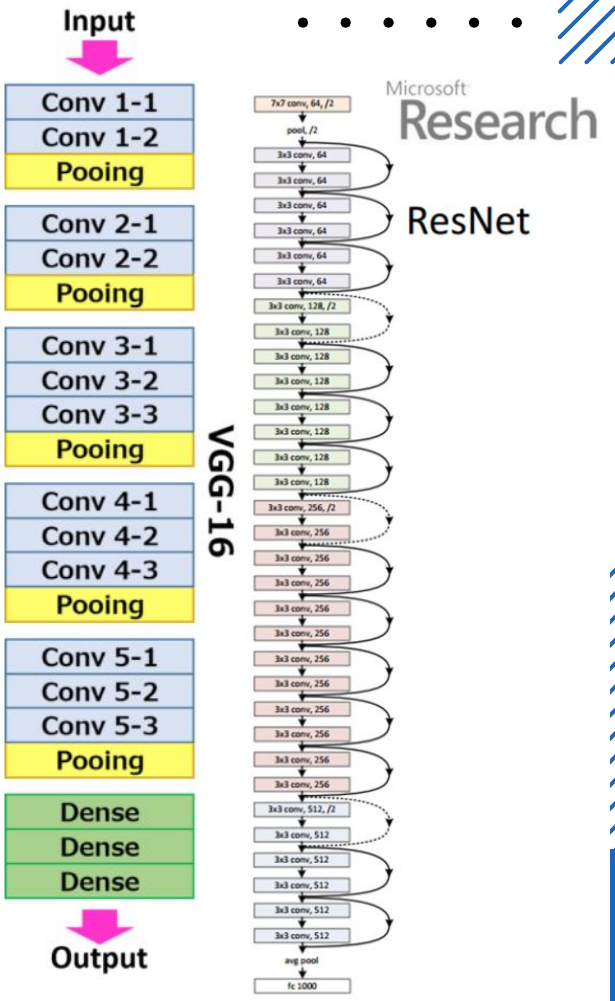
(b) After applying dropout.

CNN의 정석


Conv_1
Convolution
(5 x 5) kernel
valid padding
Max-Pooling
(2 x 2)
Conv_2
Convolution
(5 x 5) kernel
valid padding
Max-Pooling
(2 x 2)
fc_3
Fully-Connected
Neural Network
ReLU activation
fc_4
Fully-Connected
Neural Network
(with
dropout)
Flattened
INPUT
(28 x 28 x 1)
n1 channels
(24 x 24 x n1)
n1 channels
(12 x 12 x n1)
n2 channels
(8 x 8 x n2)
n2 channels
(4 x 4 x n2)
n3 units
0
1
2
9
OUTPUT

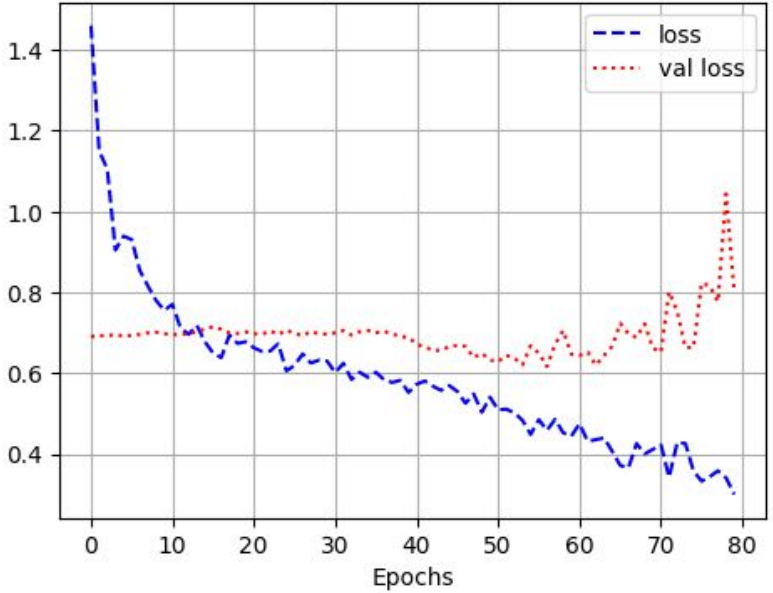
Transfer Learning?

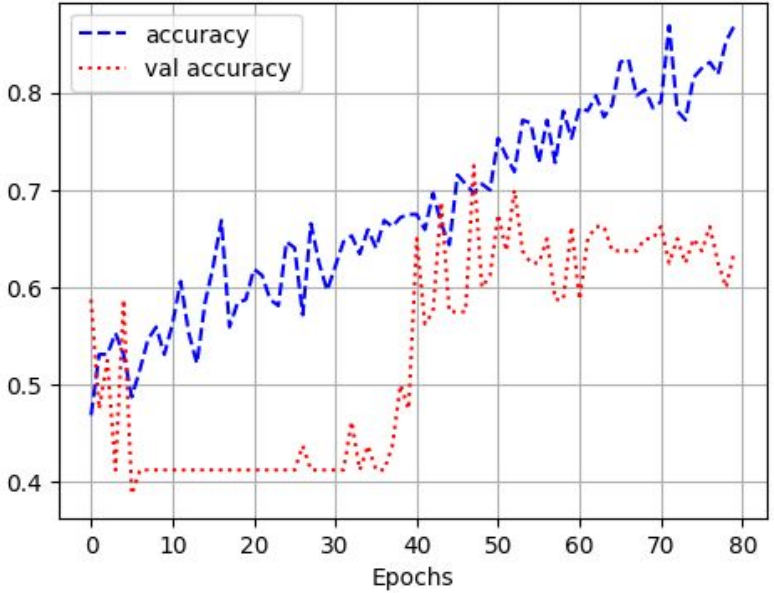




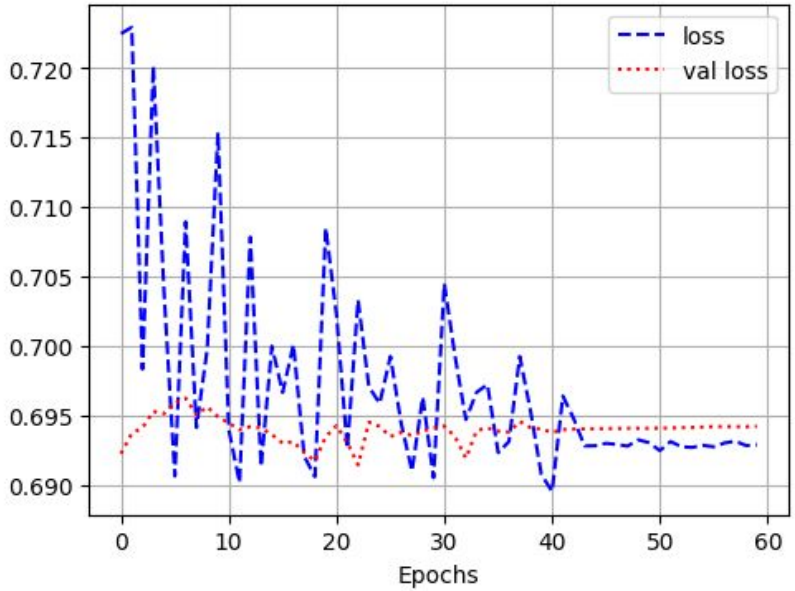
실습해봅시다!
(이전에 코딩한 창으로 이동)

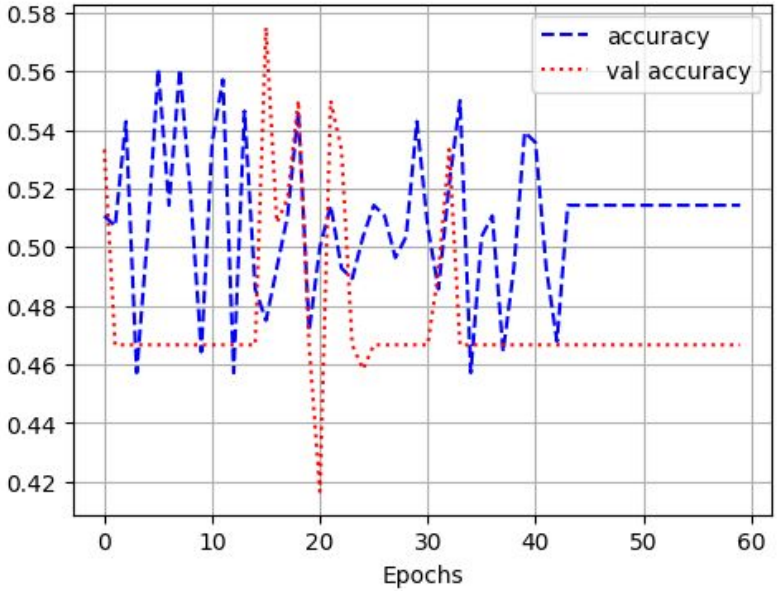
그래프 해석


loss
val loss
1.4
1.2
1.0
0.8
0.6
0.4
0
10
20
30
40
50
60
70
80
Epochs

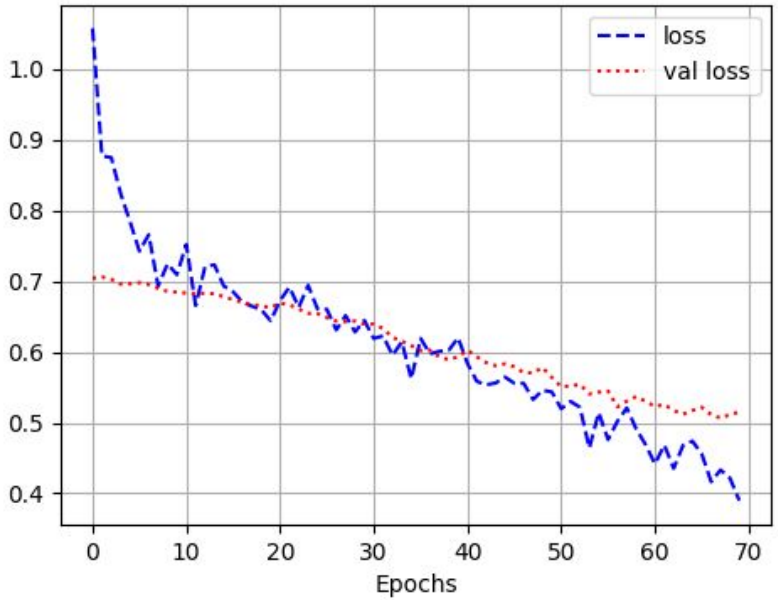

accuracy
val accuracy
0.8
0.7
0.6
0.5
0.4
0
10
20
30
40
50
60
70
80
Epochs

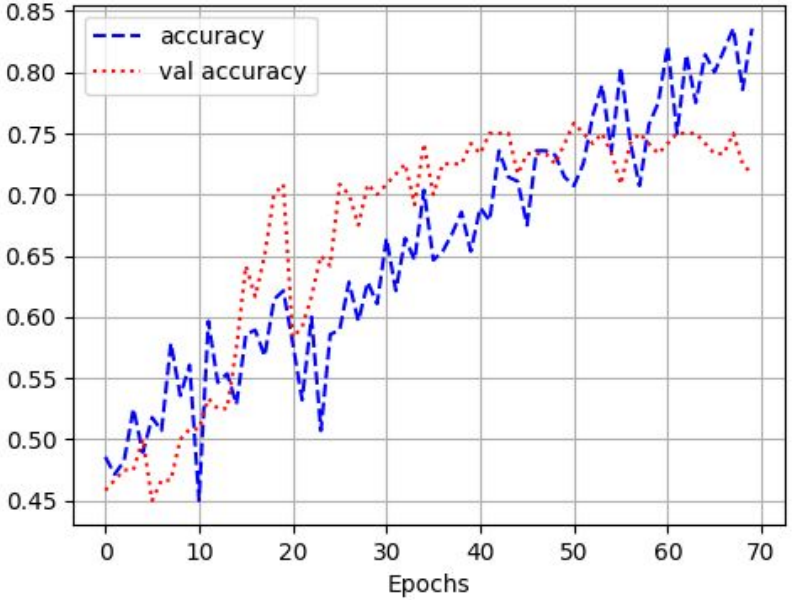
그래프 해석


loss
val loss
0.720
0.715
0.710
0.705
0.700
0.695
0.690
0
10
20
30
40
50
60
Epochs

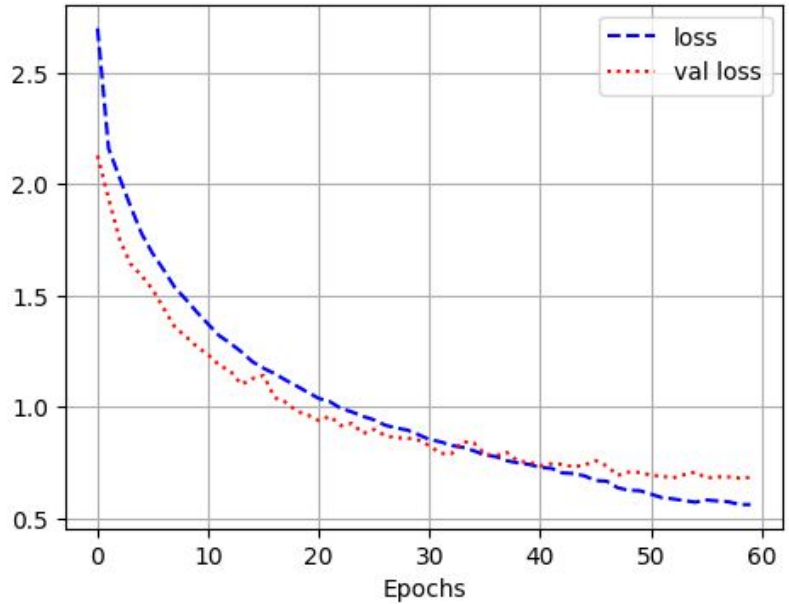

accuracy
val accuracy
0.58
0.56
0.54
0.52
0.50
0.48
0.46
0.44
0.42
0
10
20
30
40
50
60
Epochs

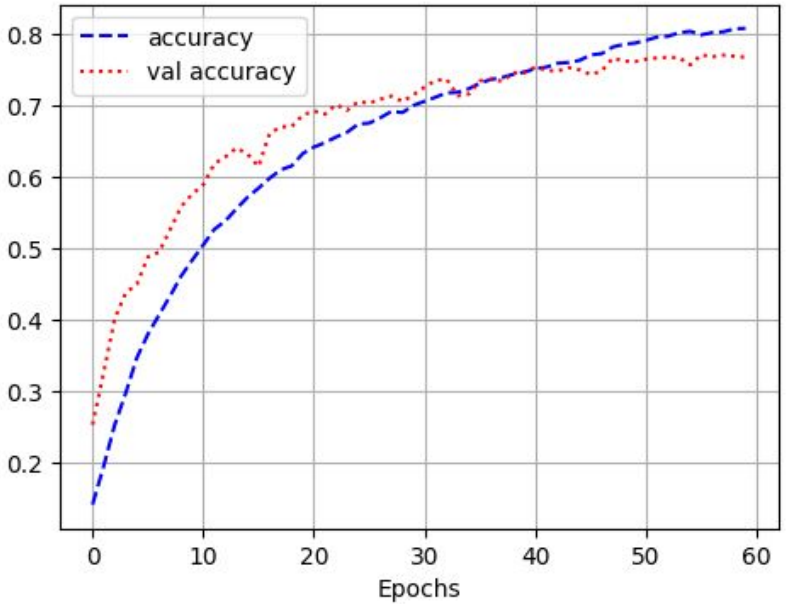
그래프 해석


loss
val loss
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0
10
20
30
40
50
60
70
Epochs


accuracy
val accuracy
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0
10
20
30
40
50
60
70
Epochs

그래프 해석


loss
val loss
2.5
2.0
1.5
1.0
0.5
0
10
20
30
40
50
60
Epochs


accuracy
val accuracy
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0
10
20
30
40
50
60
Epochs

자신만의 모델을 만들어 봅시다!

제출:

movingju06@gmail.com

OR

USB

- **오류가 났을때:**
  1. ChatGPT의 도움을 받는다.
  2. 1번을 고수한다.
  ...
  12. 도움을 요청한다.

- **좀 더 나은 모델을 구성하고 싶을때:**
  1. 도움을 요청한다.

- 정확도가 80%를 넘는 모델을 만들었을때:
  1. 즉시 저를 불러주세요.

- **이수 조건:**
  (최종 Accuracy) > 0.7 인 모델 제출하기 (마감: 수업 종료 15분전)

- **경쟁:**

(1 - 이 이미지 속 사람이 마약을 복용했을 확률) * (모델의 정확도) 의 값이 가장 높은 모둠이 되기

인공지능에 대한 이야기