

# Deep Neural Networks

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***POSTECH***

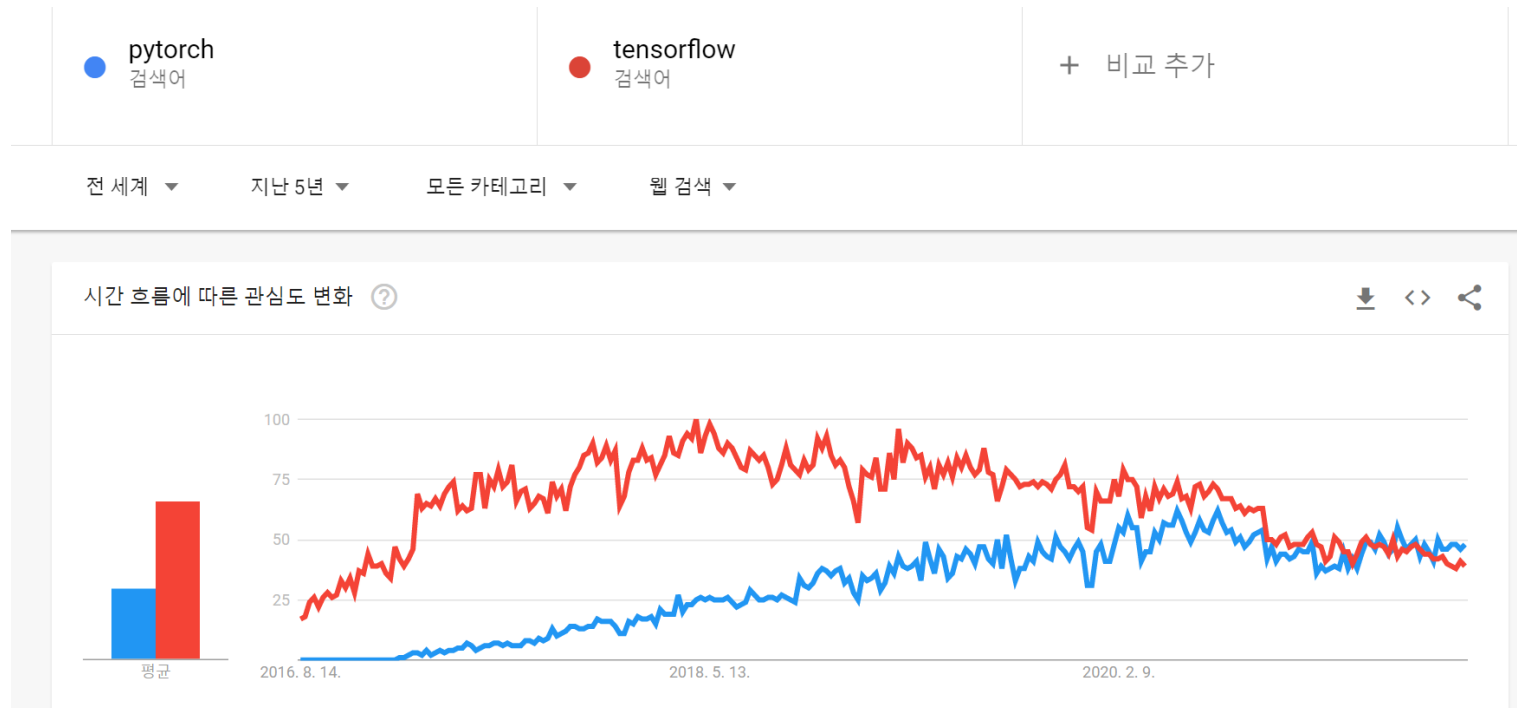
# PyTorch

- Activate course environment by typing *conda activate {env name}*
- Install pytorch and torchvision

```
(course) C:\#Users\#owner>conda install pytorch torchvision  
Collecting package metadata (current_repodata.json): done  
Solving environment: done
```

# PyTorch

- Deep Learning Library
- Open Source
- Primarily developed by Facebook's AI
- From September 2016
- Neural Network 학습에 필요한 전반적인 기능을 제공



# Model Training

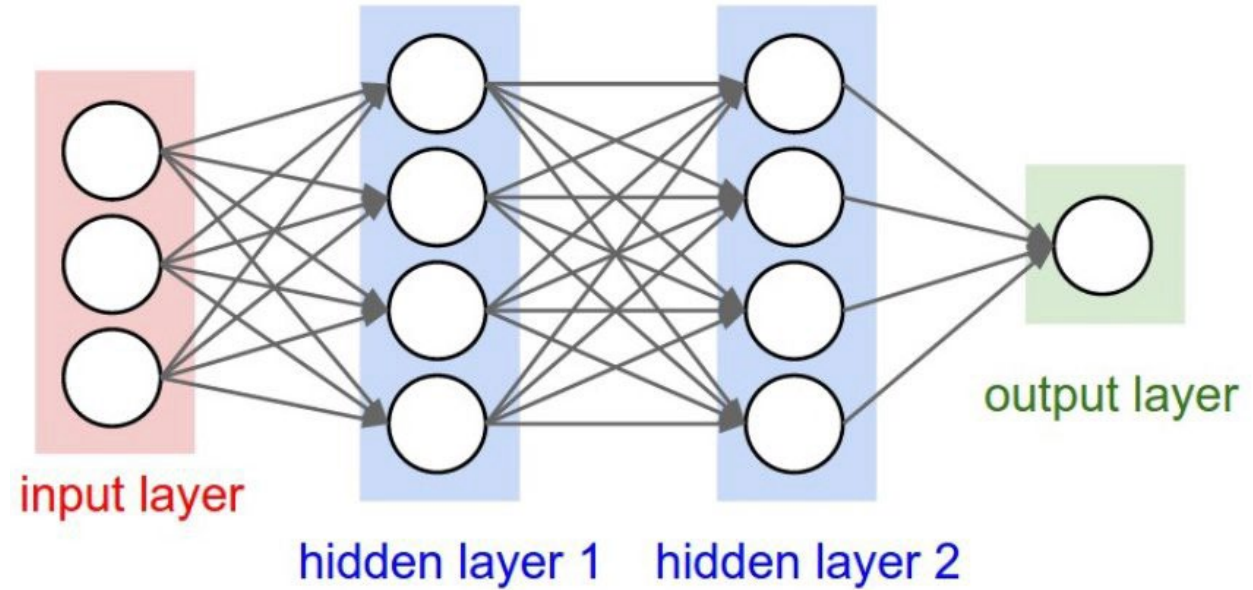
- Load dataset
- Training

1. Inference

2. Loss

3. Gradient

4. Update



# Model Training

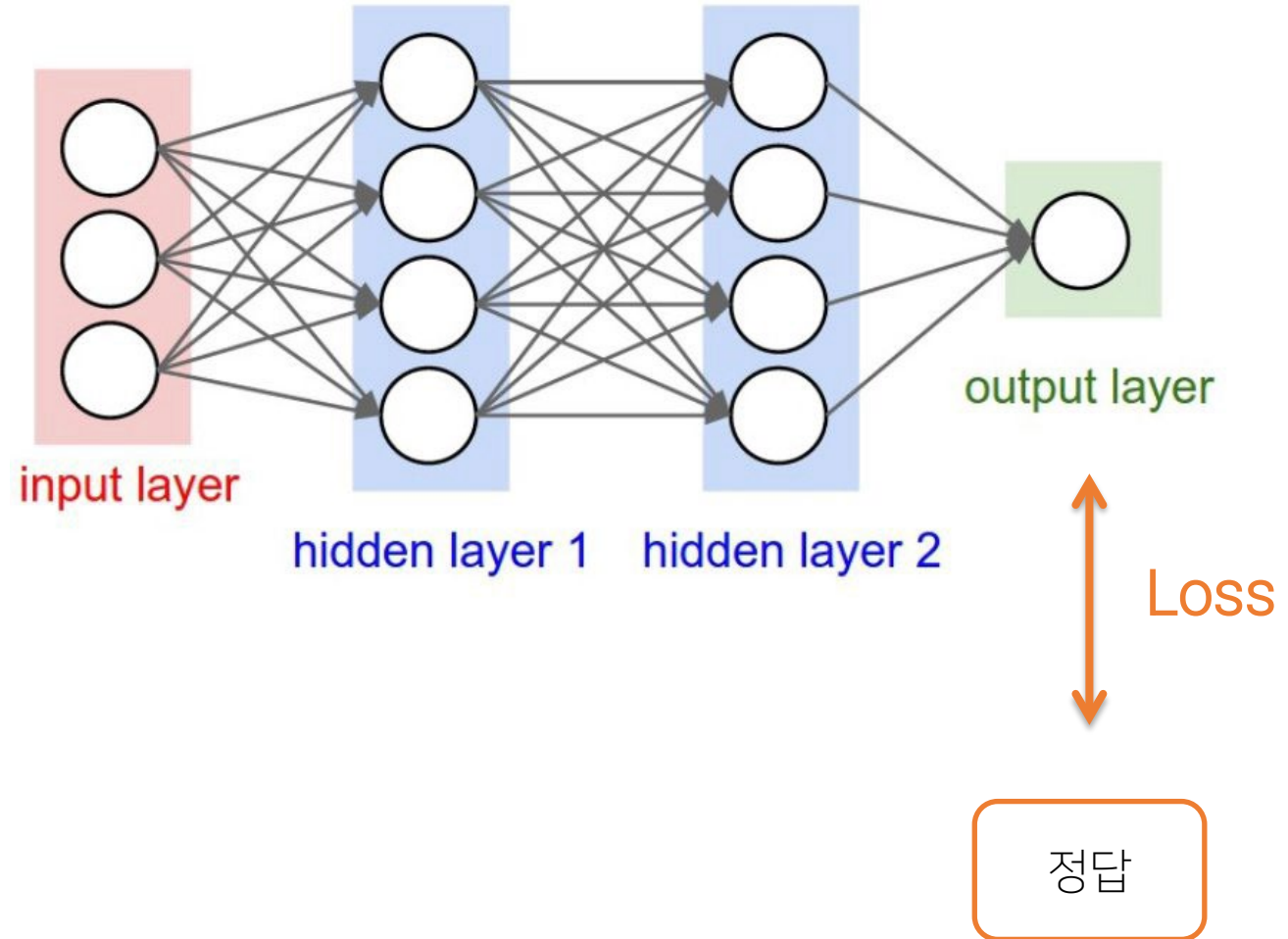
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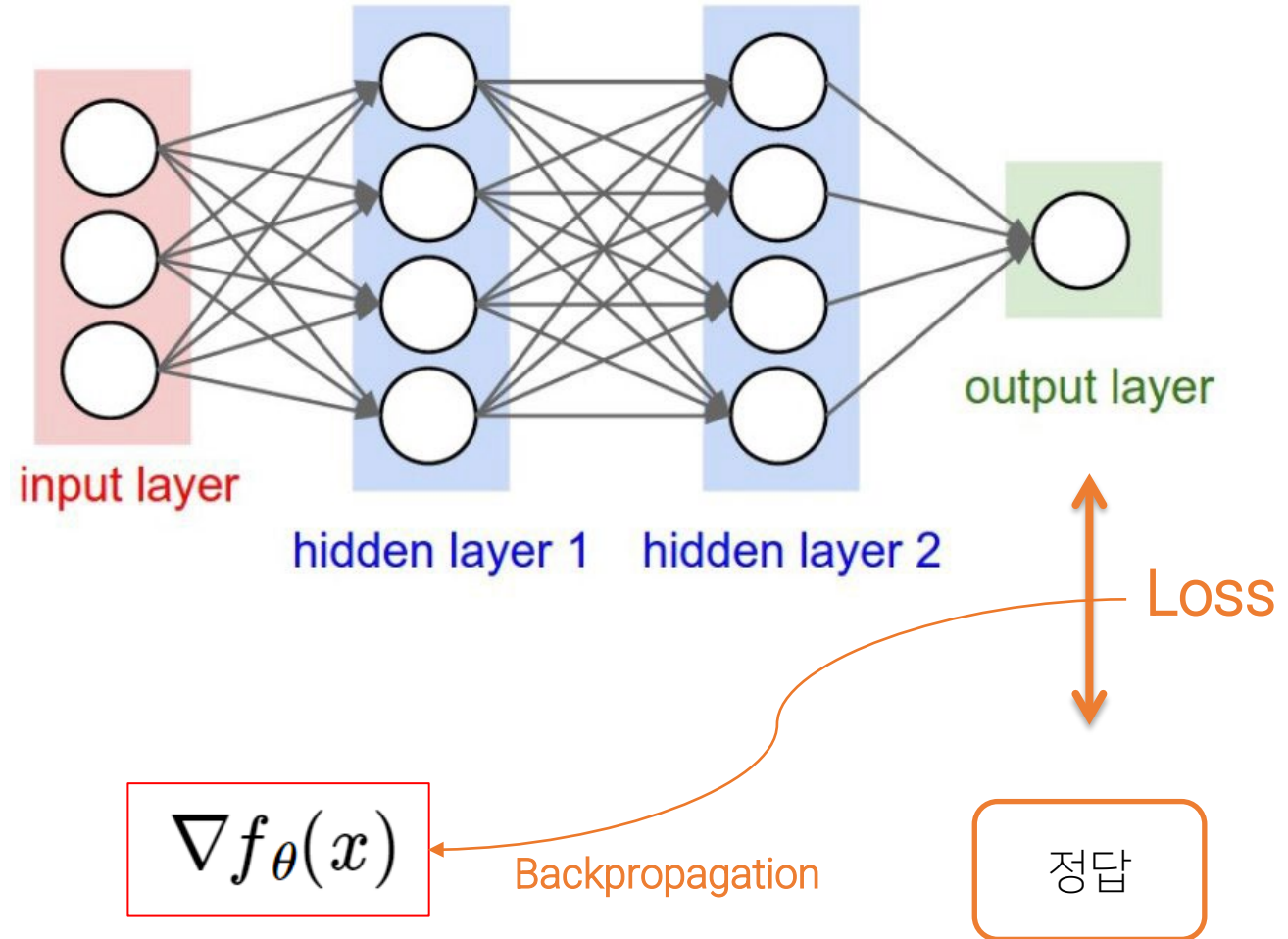
4. Update



# Model Training

- Load dataset
- Training

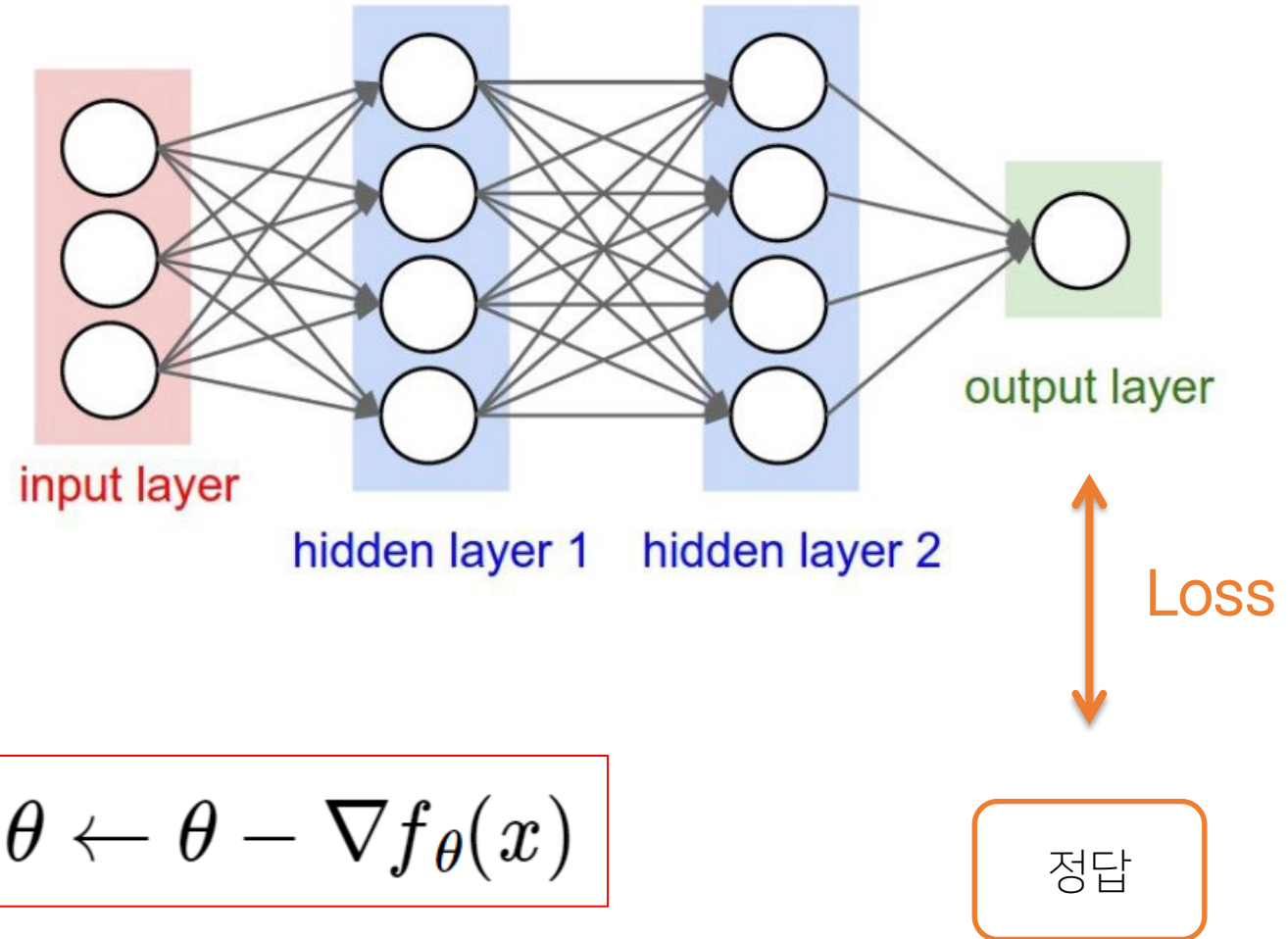
1. Inference
2. Loss
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# Model Training

- Load dataset
- Training

1. Inference
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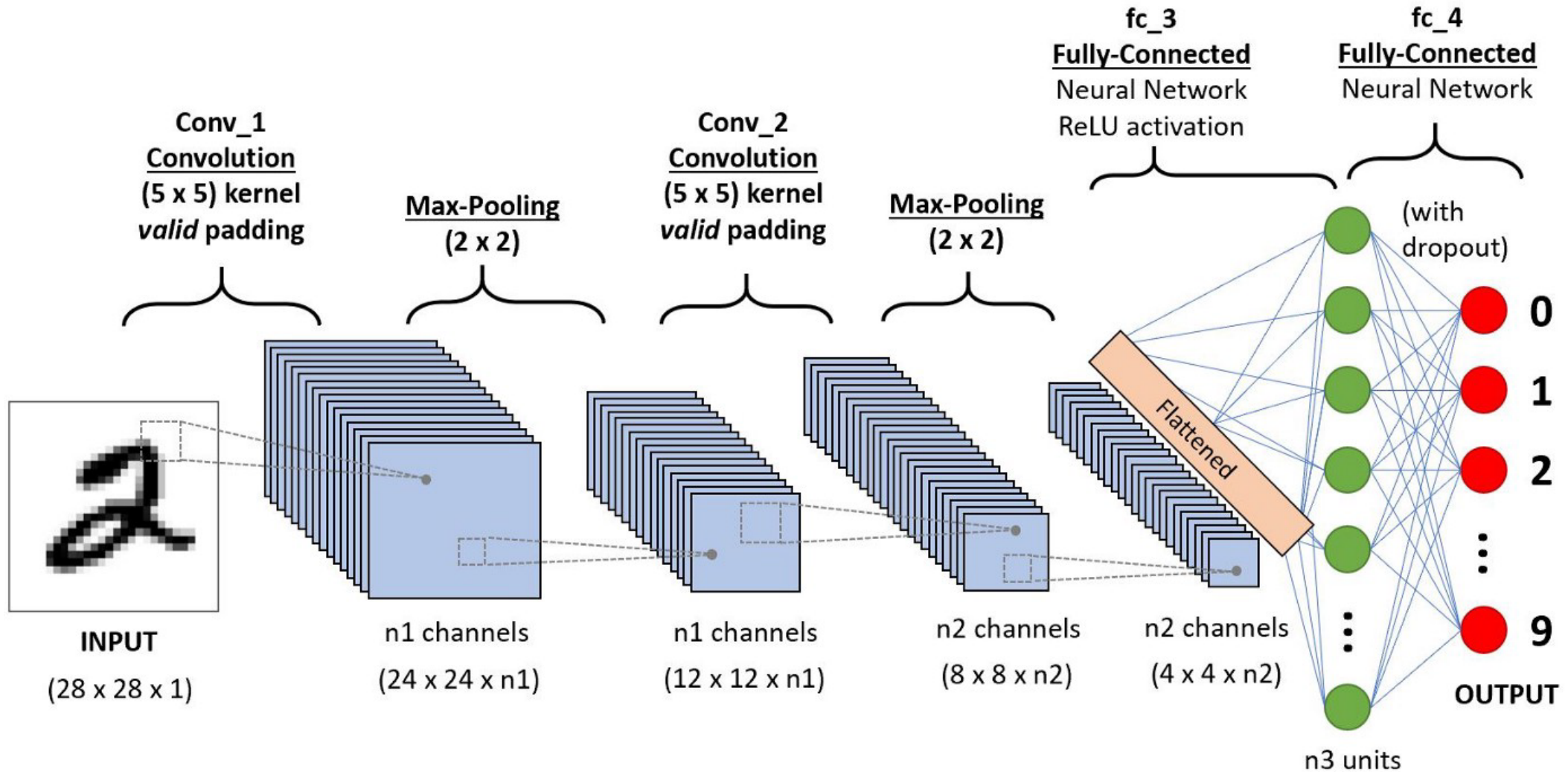


# Convolutional Neural Networks



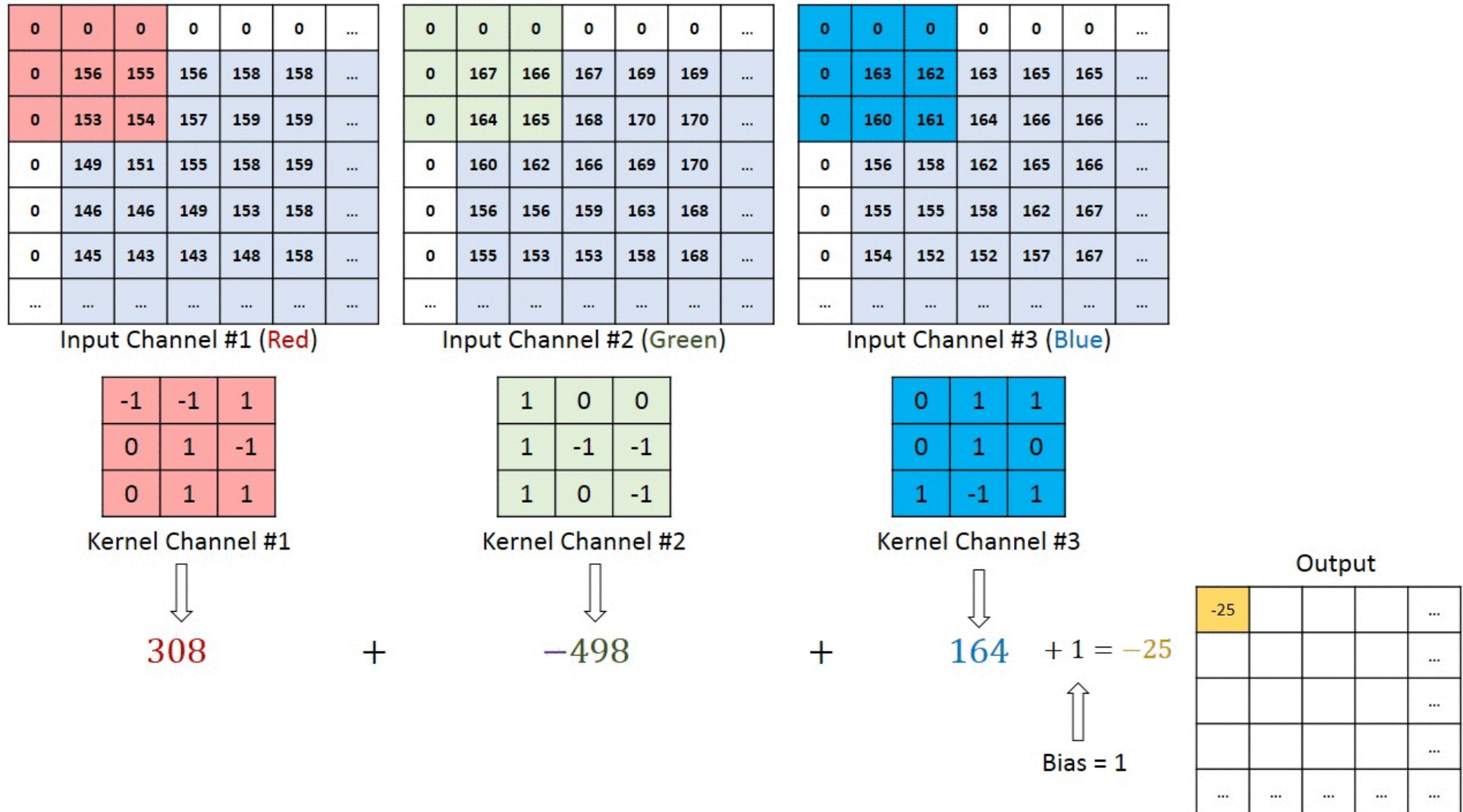
# Convolutional Neural Network (CNN)

- Filter values를 최적화 과정을 통해서 찾음 (+ bias)



# Convolutional Neural Network (CNN)

- CNN Diagram GIF



# Convolutional Neural Network (CNN)

- Filter values를 최적화 과정을 통해서 찾음 (+ bias)
- Input과 Output의 Dimension이 다를 수 있음
  - Padding과 Stride를 통해서 조절
  - $W' = \frac{W-F+2*P}{S} + 1$ ,
  - where  $W'$  output width,  $W$  input width,  $F$  convolution filter width,  $P$  padding, and  $S$  stride
  - Normally,  $P = \text{Floor}(\frac{F}{2})$  and  $S = 1$  make identical spatial resolution

