PYTORCH INTRO

MENTORS

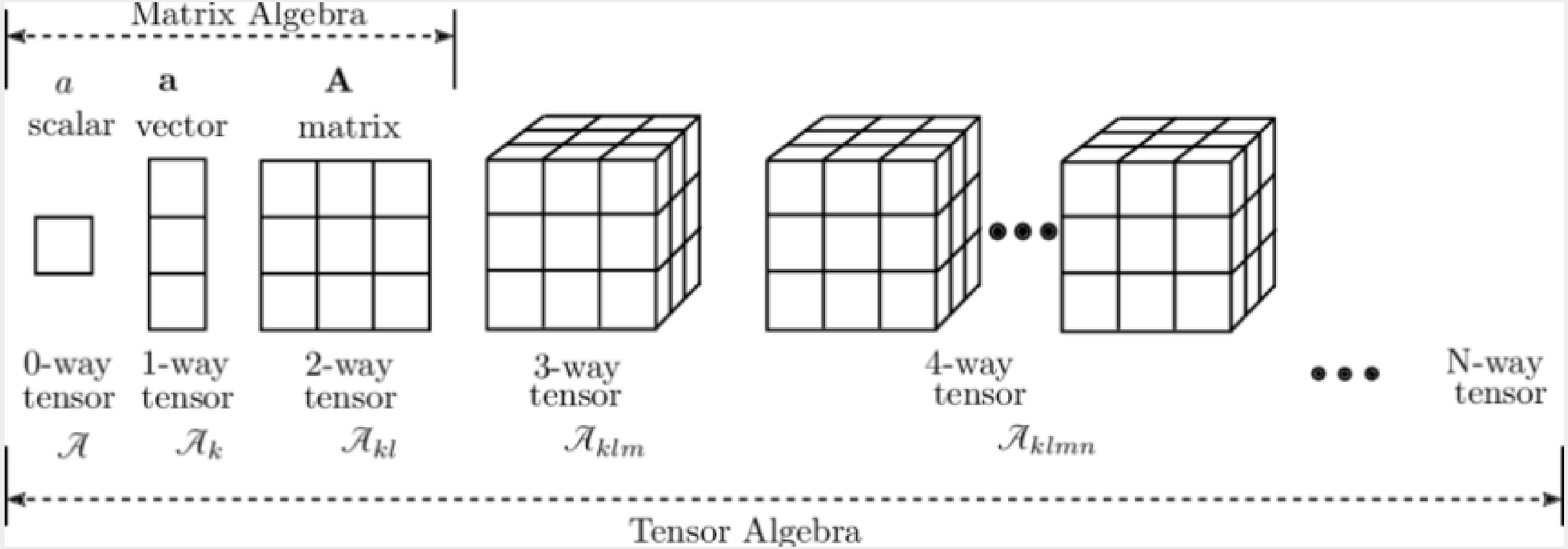

PyTorch


TensorFlow


K
Keras

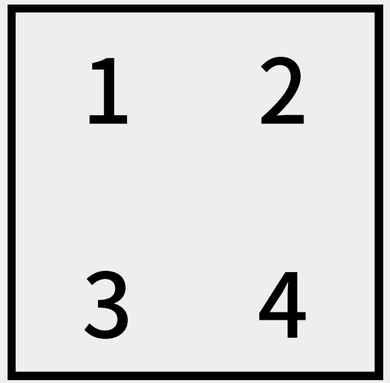

colab

Tensor


Matrix Algebra
a
scalar
$\mathbf{a}$
vector
$\mathbf{A}$
matrix
0-way tensor
$\mathcal{A}$
1-way tensor
$\mathcal{A}_k$
2-way tensor
$\mathcal{A}_{kl}$
3-way tensor
$\mathcal{A}_{klm}$
4-way tensor
$\mathcal{A}_{klmn}$
N-way tensor
Tensor Algebra

Tensor

x_data =



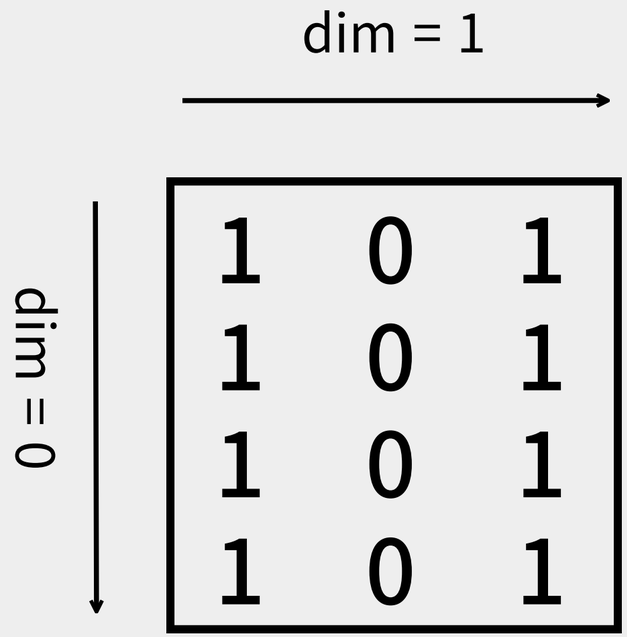
CUDA

~~TPU~~
~~Radeon~~
~~etc.~~

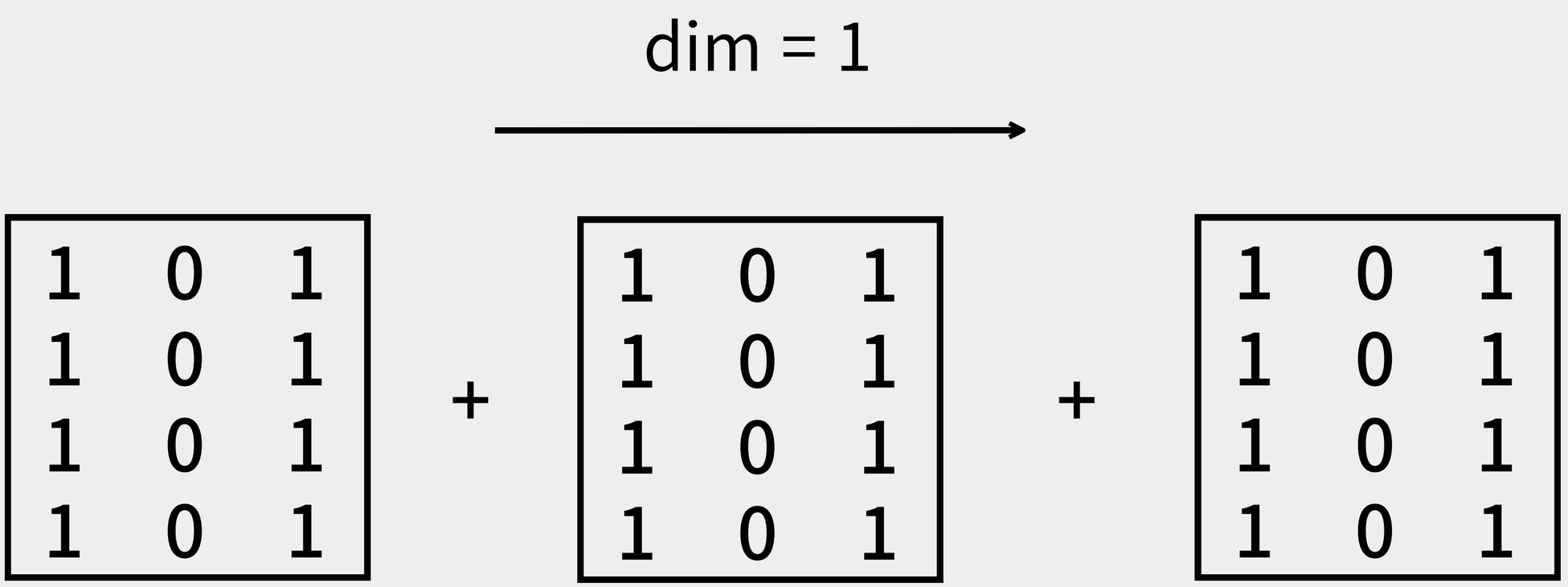
CUDA

Not Recommand...

Tensor Operation - concatenate



Tensor Operation - concatenate

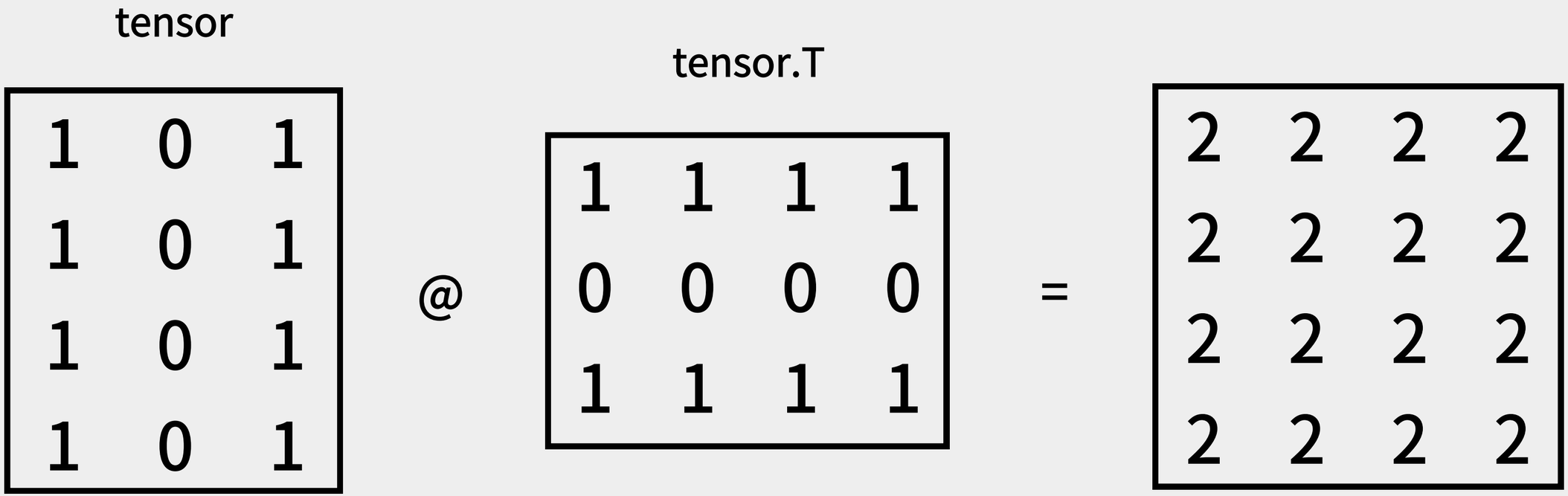


Tensor Operation - concatenate

dim = 1

1	0	1	1	0	1	1	0	1
1	0	1	1	0	1	1	0	1
1	0	1	1	0	1	1	0	1
1	0	1	1	0	1	1	0	1

Tensor Operation - matrix multiplication



Tensor Operation - shape manipulation

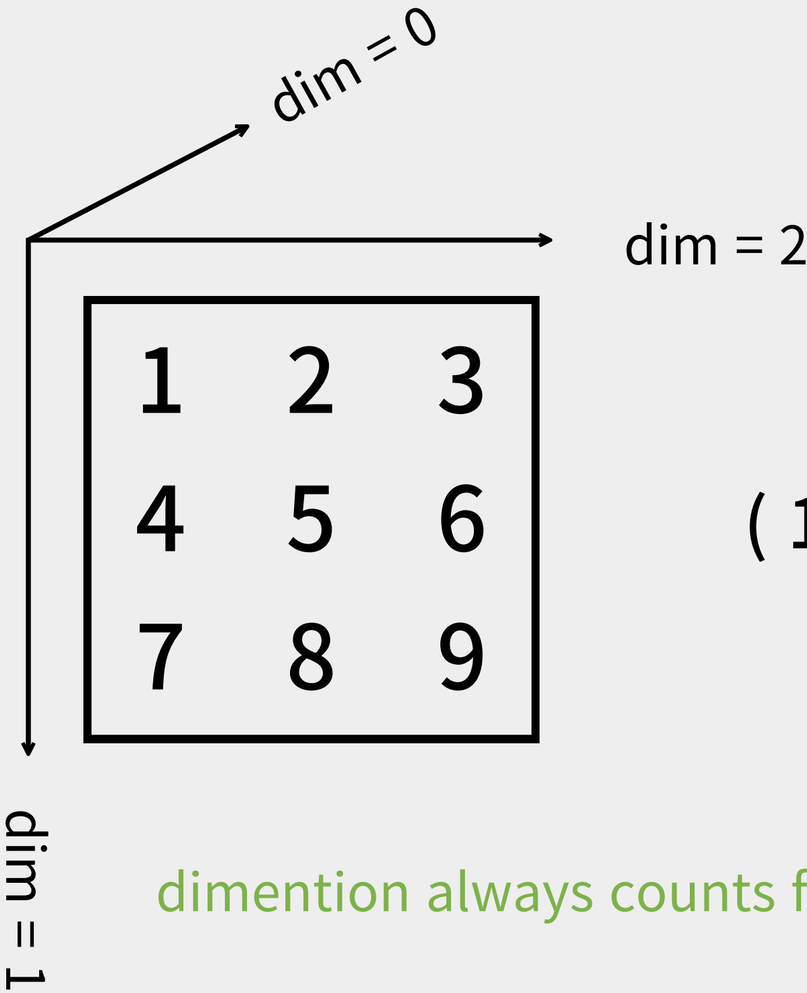
$$x = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix} \quad (3,3)$$

dim = 1

dim = 0

Tensor Operation - shape manipulation

x.unsqueeze(0) =

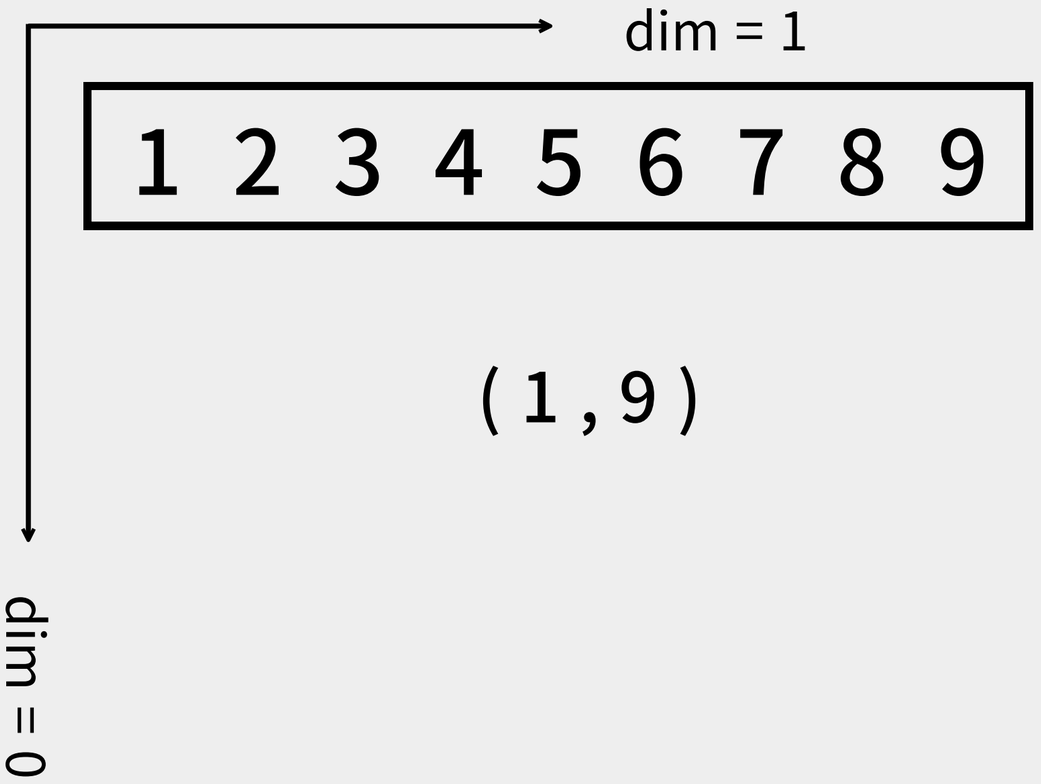


(1, 3, 3)

dimention always counts from outermost

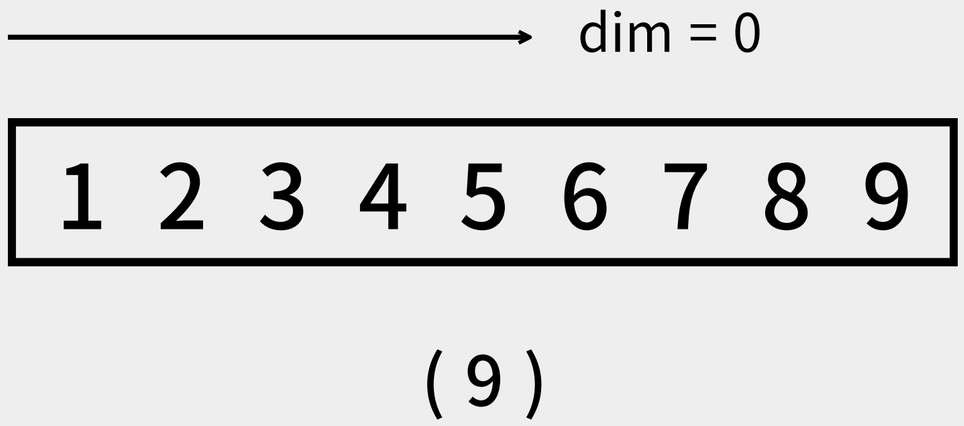
Tensor Operation - shape manipulation

x.view(9) =



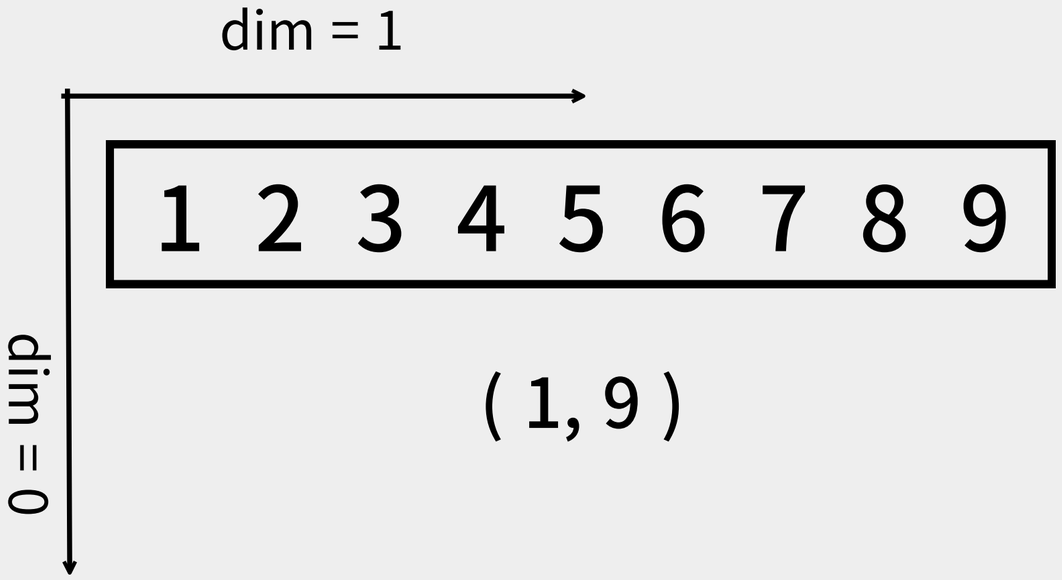
Tensor Operation - shape manipulation

torch.arange(1, 10) =



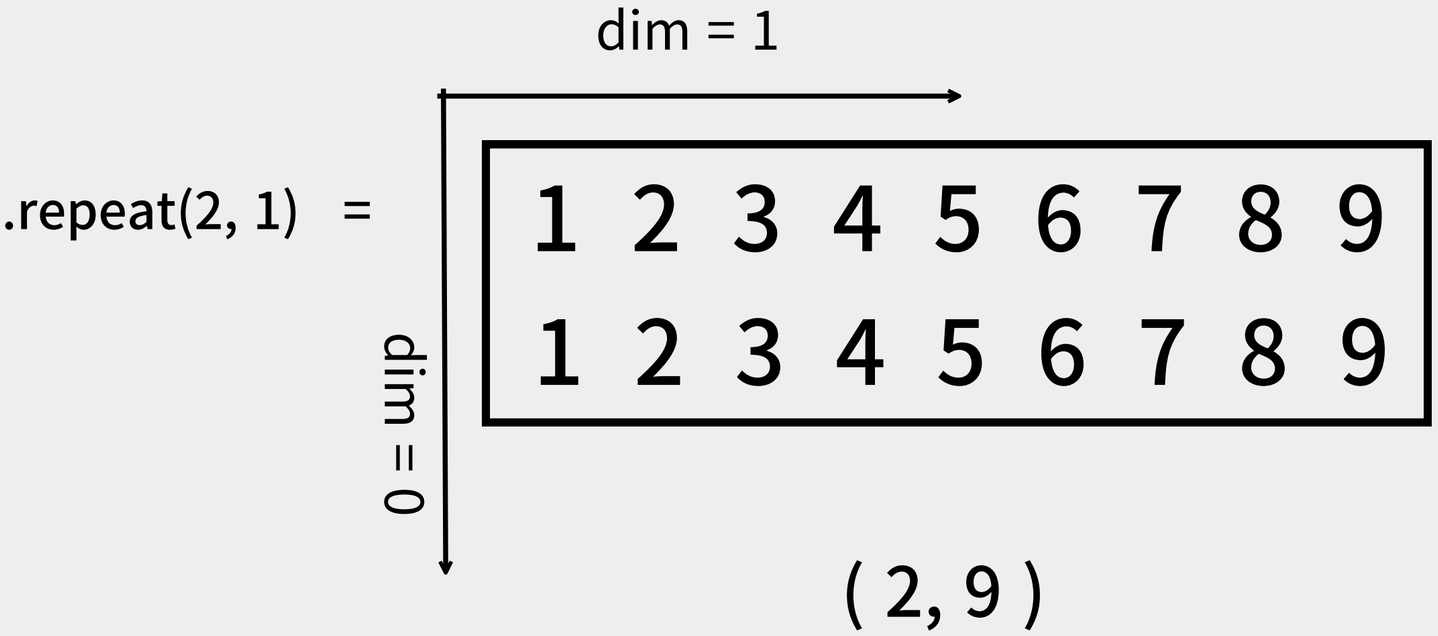
Tensor Operation - shape manipulation

torch.arange(1, 10).unsqueeee(0) =



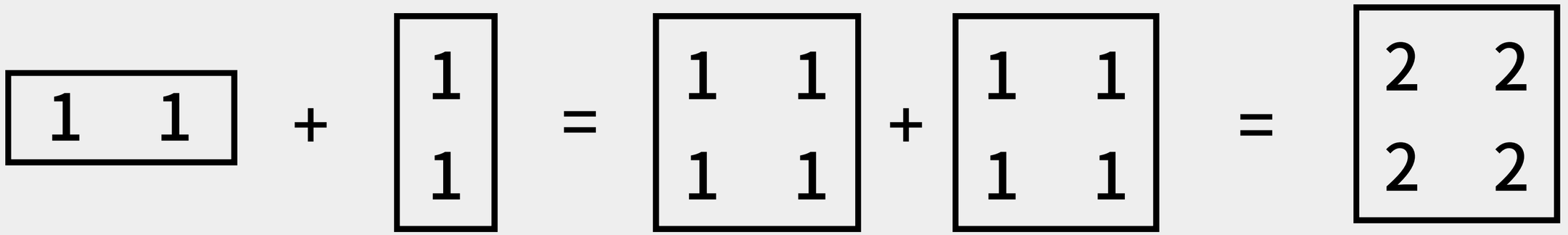
Tensor Operation - shape manipulation

torch.arange(1, 10).unsqueeee(0).repeat(2, 1) =

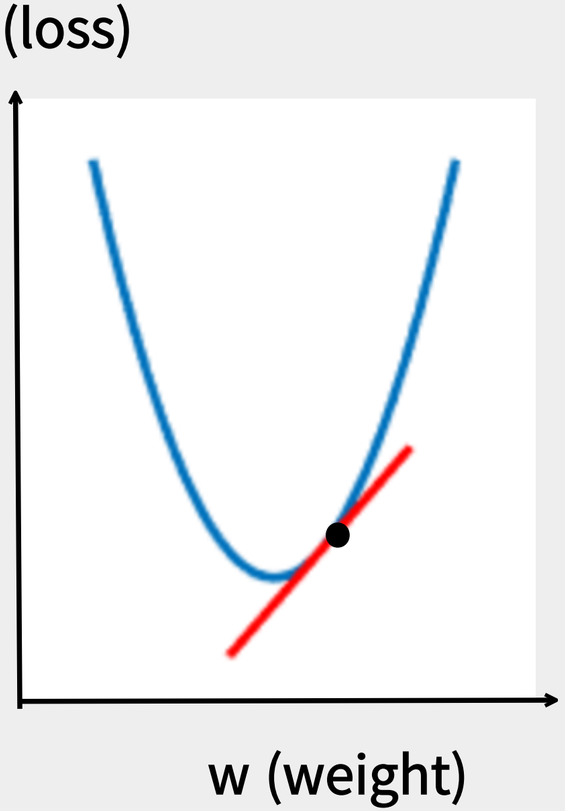


Tensor Operation - shape manipulation

Broadcasting



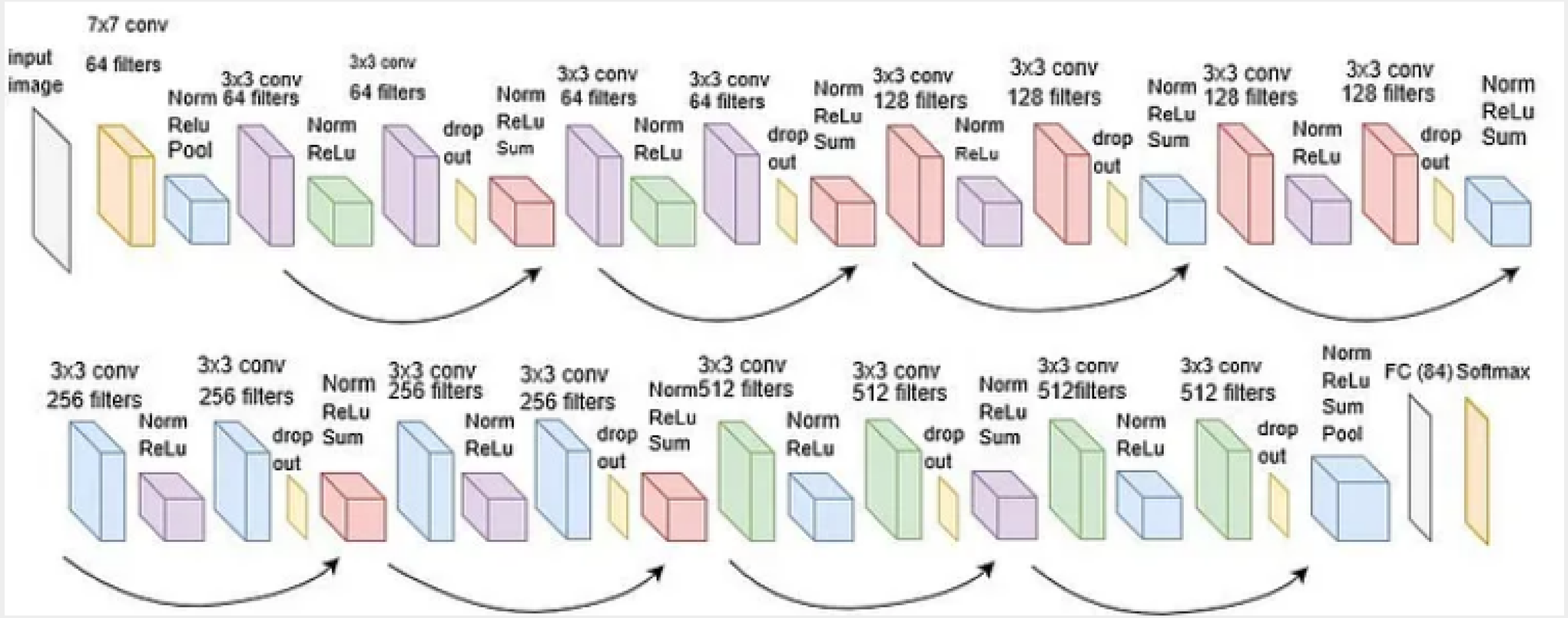
AutoGrad



$$\frac{\mathrm{d}l}{\mathrm{d}w} = \frac{\mathrm{d}l}{\mathrm{d}a} * \frac{\mathrm{d}a}{\mathrm{d}w}$$
$$= 2a * 3$$
$$= 2(3w) * 3$$
$$= 18$$

Tensor with 'requires_grad=True' compute this automatically

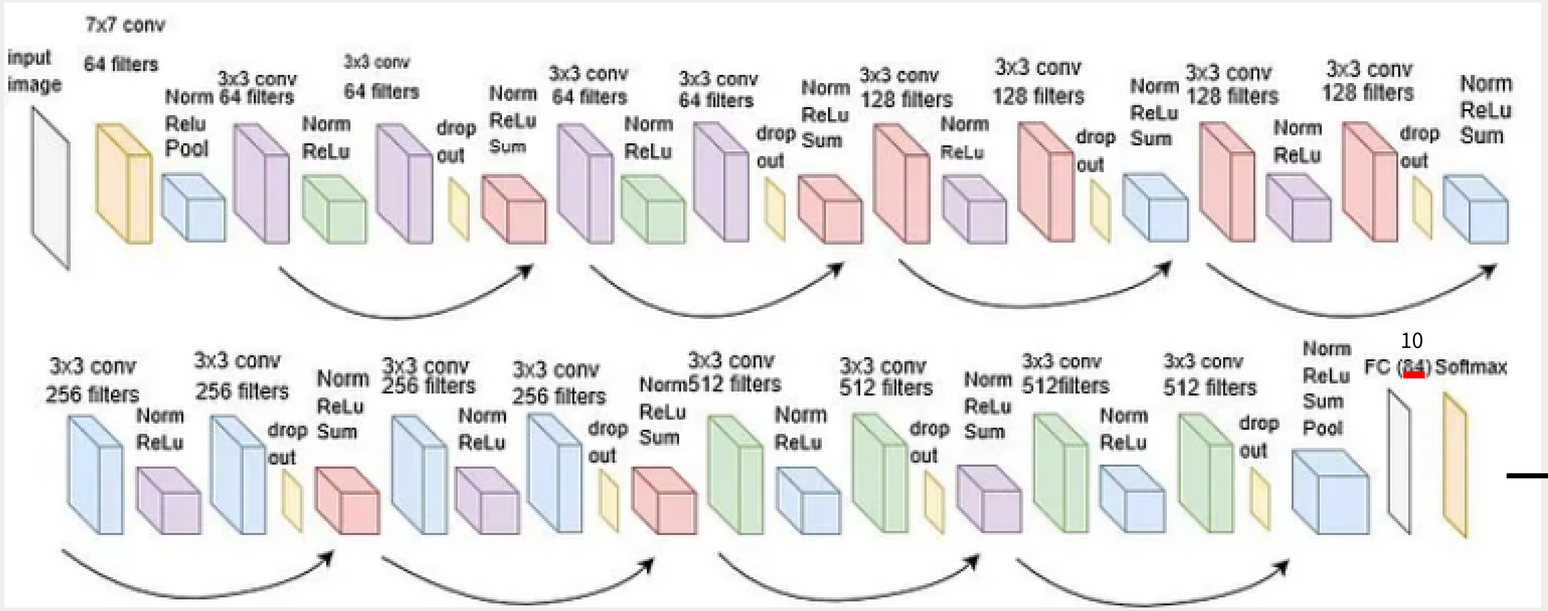
Resnet18


input image
7x7 conv
64 filters
Norm
Relu
Pool
3x3 conv
64 filters
Norm
ReLu
3x3 conv
64 filters
drop
out
Norm
ReLu
Sum
3x3 conv
64 filters
Norm
ReLu
3x3 conv
64 filters
drop
out
Norm
ReLu
Sum
3x3 conv
128 filters
Norm
ReLu
3x3 conv
128 filters
drop
out
Norm
ReLu
Sum
3x3 conv
128 filters
Norm
ReLu
3x3 conv
128 filters
drop
out
Norm
ReLu
Sum
3x3 conv
256 filters
Norm
ReLu
3x3 conv
256 filters
drop
out
Norm
ReLu
Sum
3x3 conv
256 filters
Norm
ReLu
3x3 conv
256 filters
drop
out
Norm
ReLu
Sum
3x3 conv
512 filters
Norm
ReLu
3x3 conv
512 filters
drop
out
Norm
ReLu
Sum
3x3 conv
512filters
Norm
ReLu
3x3 conv
512 filters
drop
out
Norm
ReLu
Sum
Pool
FC (84)
Softmax

Resnet18

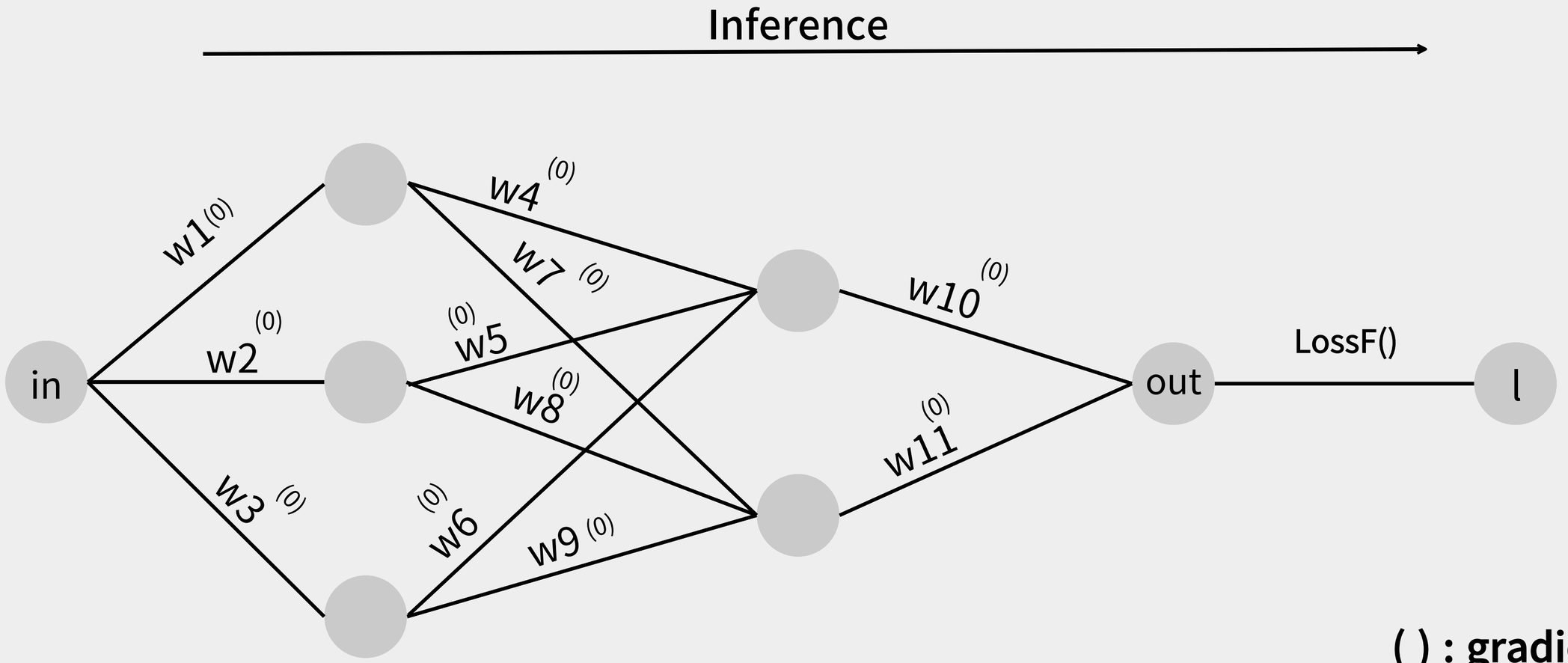
net()

torch.rand(1, 3, 224, 224) →



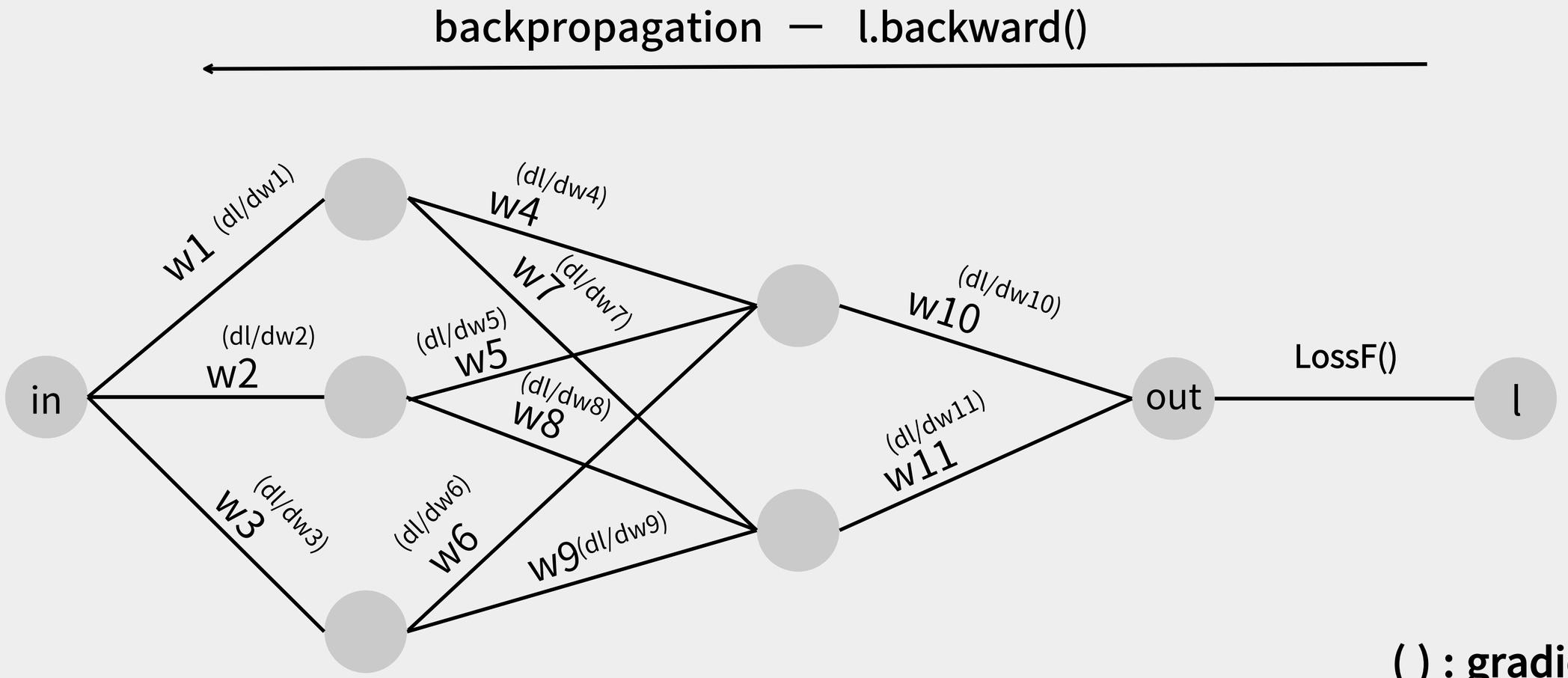
→ out

backpropagation



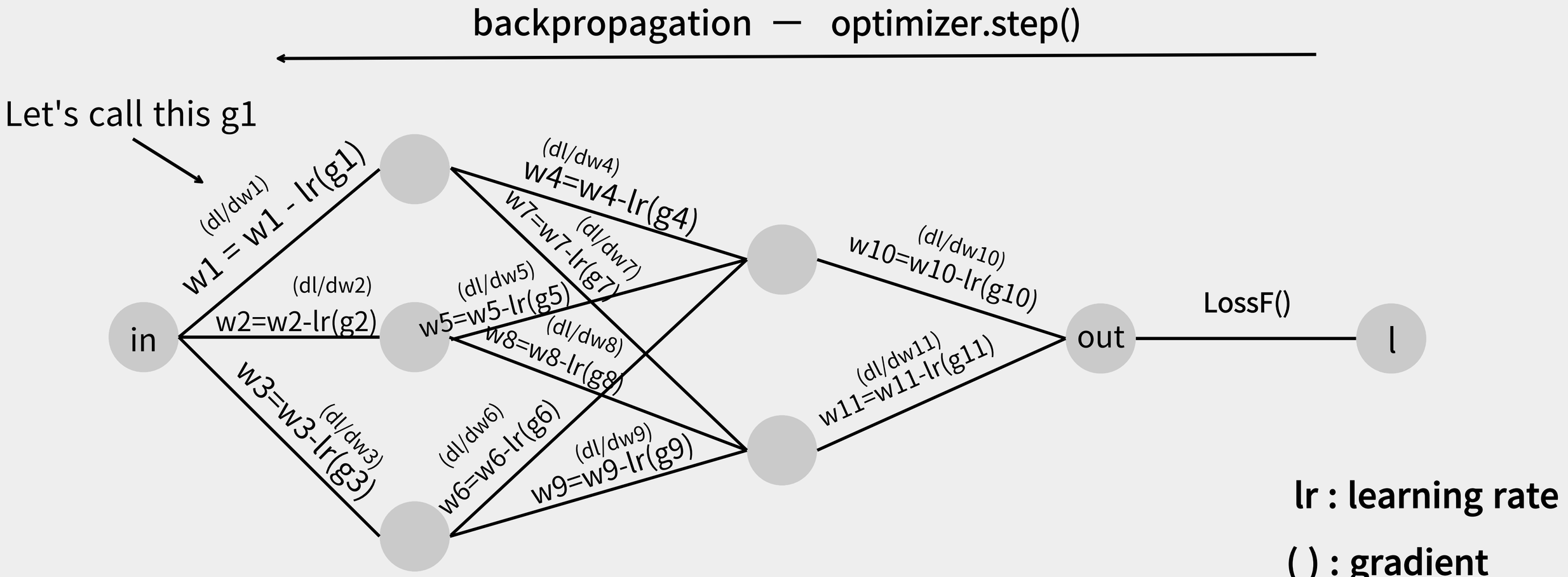
( ) : gradient

backpropagation



( ) : gradient

backpropagation

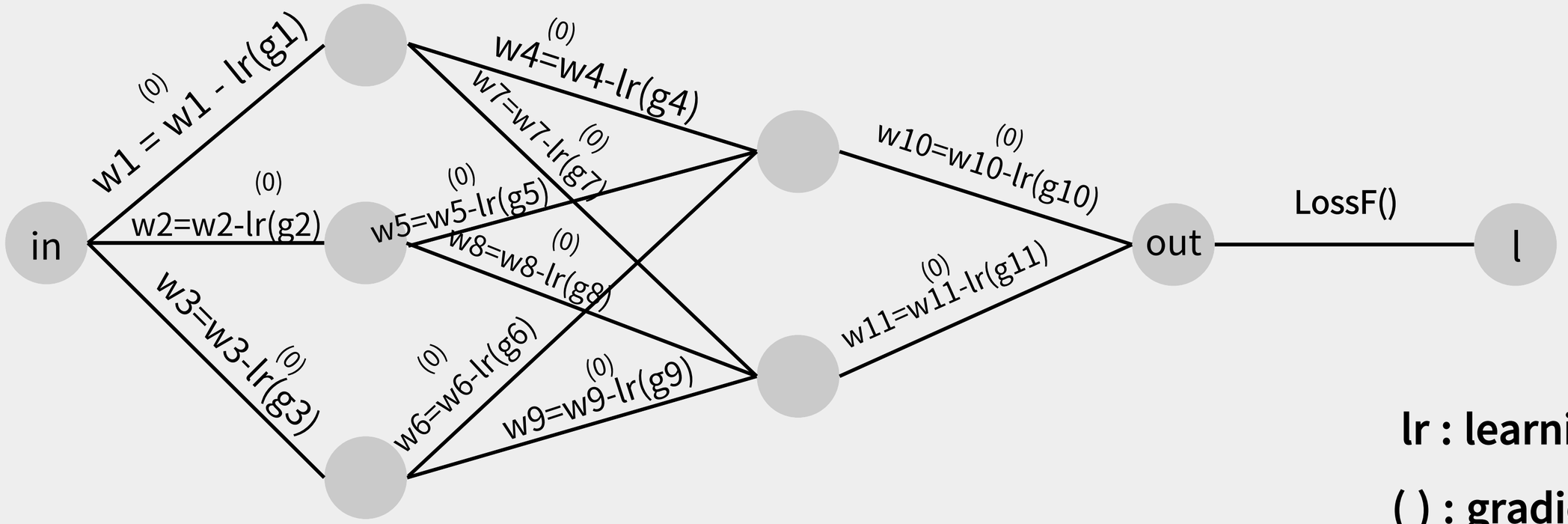


lr : learning rate

( ) : gradient

backpropagation

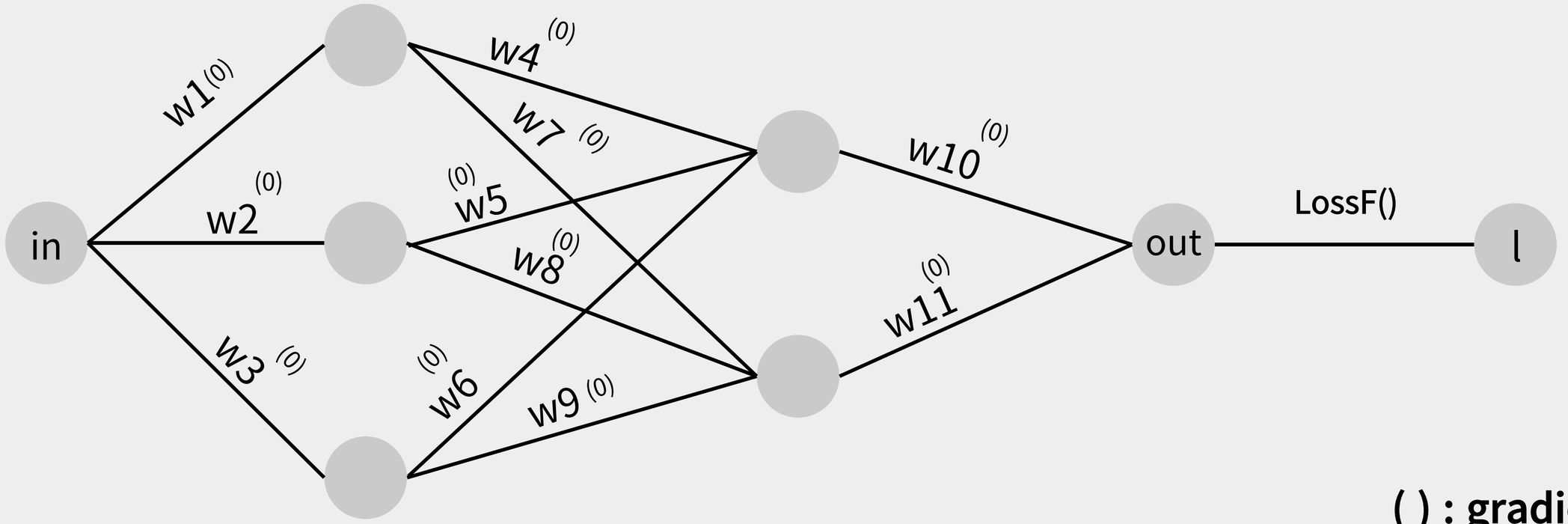
zero_grad()



lr : learning rate

( ) : gradient

backpropagation



( ) : gradient

조편성

1조	2조	3조	4조	5조	6조
배진우	최선우	차예찬	배세은	김윤희	정진우
윤준서	박가현	장운영	이다현	변수양	김수연
전성환	장유민	유리안	조현우	홍석영	강태현
이준우	윤진호	김준서	조시연	박성영	김민겸
조은나라	이준성	윤준호	전홍선	김민성	임민석

Membership Fee

우리은행

1002563090948

10000₩ / semester

Workspace