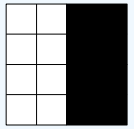
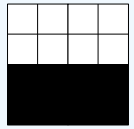
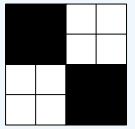
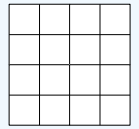
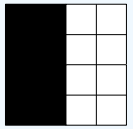
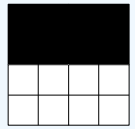
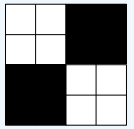
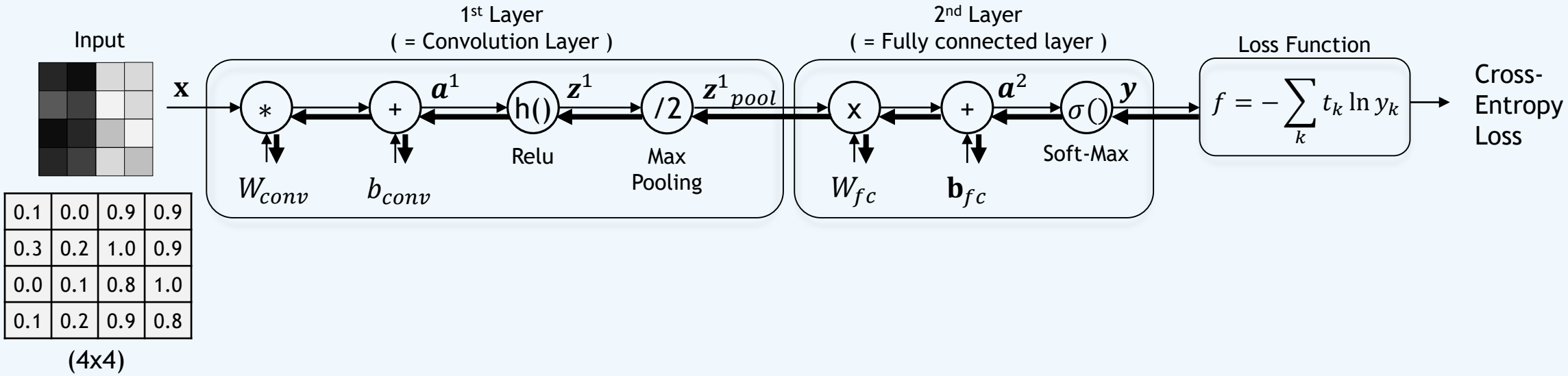
Exercise

Convolution Neural Networks

Convolution Neural Network : Image direction detection

- Detecting image direction
  - 4x4 gray scale image, 4-directions
  - Label 4 directions with binary vector
  - Pooling : Max pooling, size = (2x2), stride = 2
  - Activation Function : Relu, Soft-max

Direction	Non	vertical	horizontal	diagonal
Image				
				
Label	[1,0,0,0]	[0,1,0,0]	[0,0,1,0]	[0,0,0,1]



Convolution Neural Network

- Weights

– Convolution Layer

1) w_conv : size = user define (ex) 3x3), stride = 1

2) b_conv : size = 1 (constant)

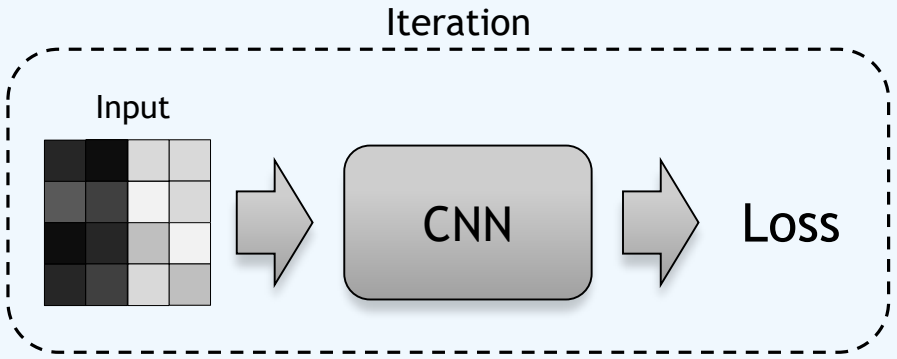
(The weights are randomly initialized.)

– Fully connected Layer

1) w_fc : size = (4x4)

2) b_fc : size = (4x1) (where 4 is target size)

- The complete matlab file shows decreasing training loss.
- Trun in the completed CNN_Exercise.m



The graph of loss depends on initial weight