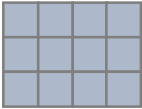
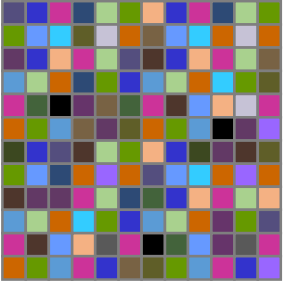
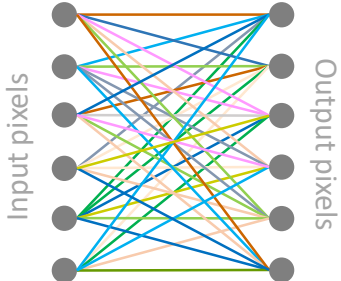


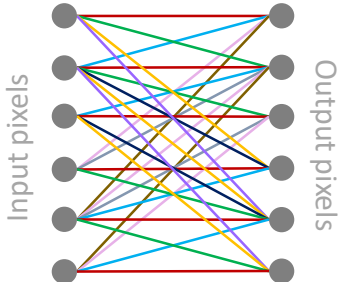

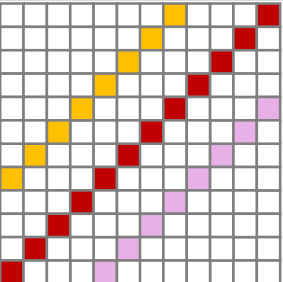
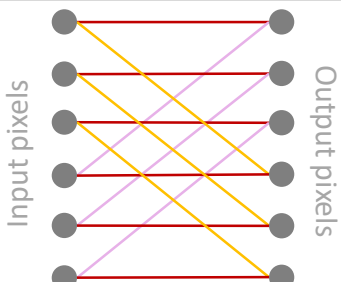

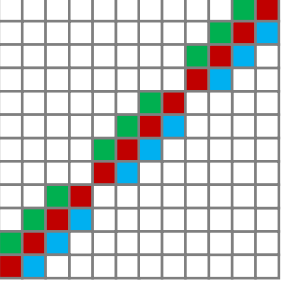
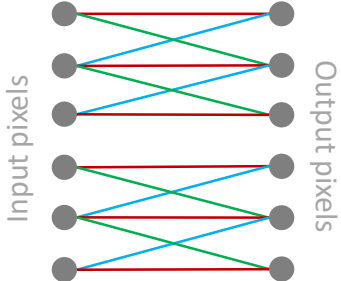
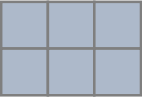
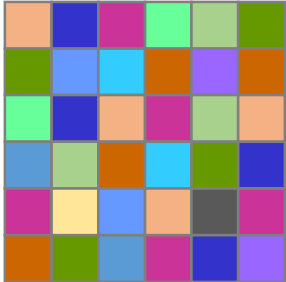
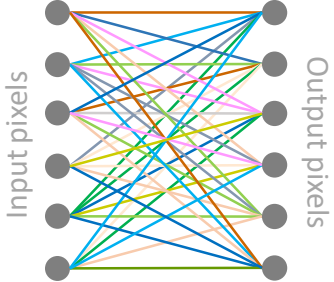
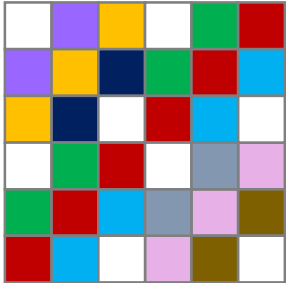
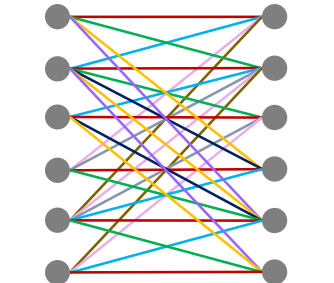
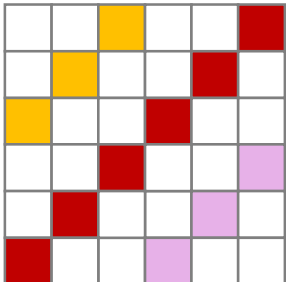
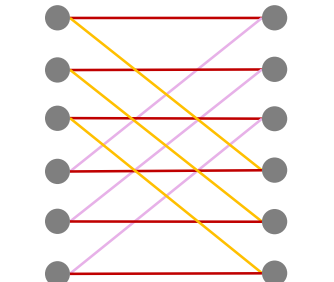
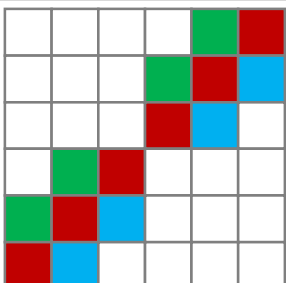
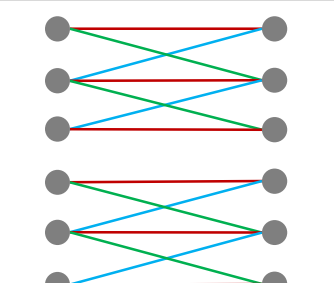
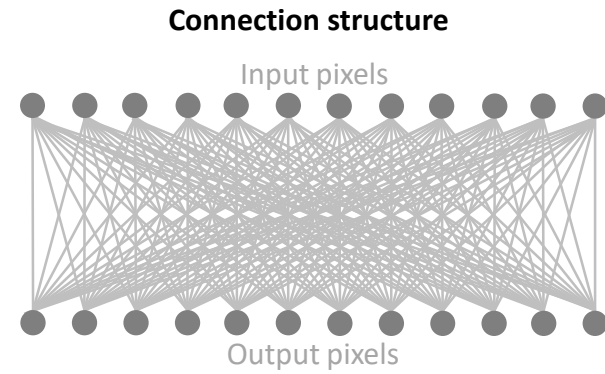
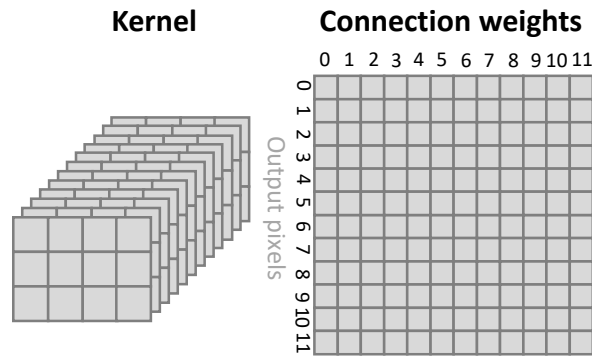


Input image (3 x 4 pixels)		Kernel	Connection weights	Connection structure
	a Fully connected layer structure	N/A		
	b Convolutional full rank			
	c Convolutional low-rank vert.			
	d Convolutional low-rank horiz.			

<div> <div>Input image</div> <div>(2 X 3 pixels)</div>  </div>			
	Kernel	Connection weights	Connection structure
a	Fully connected layer structure		
b	Convolutional full rank		
c	Convolutional low-rank vert.		
d	Convolutional low-rank horiz.		

(a) Fully connected layer structure



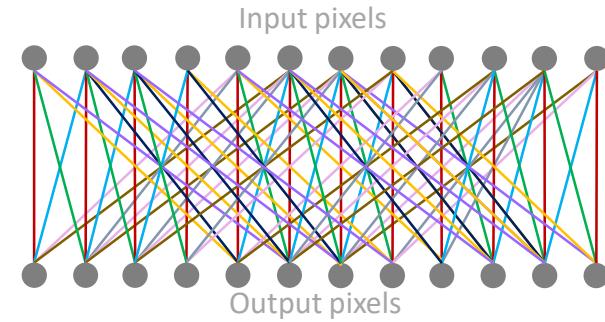
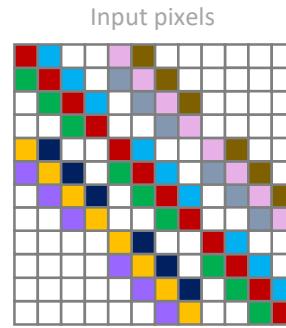
Input image
(zero-padded 3 x 4 pixels)

	0	1	2	3
	4	5	6	7
	8	9	10	11

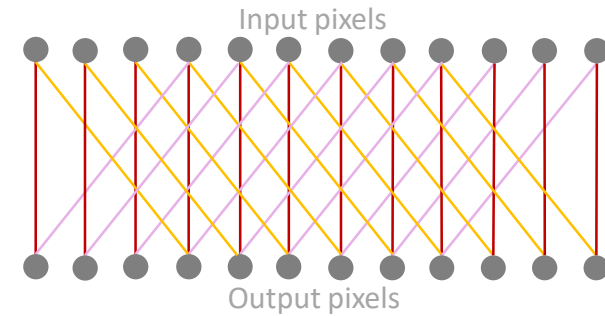
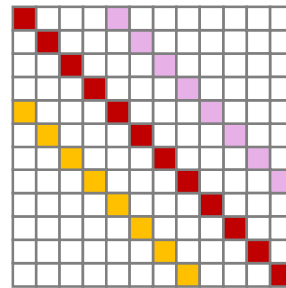
Output feature map
(4 x 3)

0	1	2	3
4	5	6	7
8	9	10	11

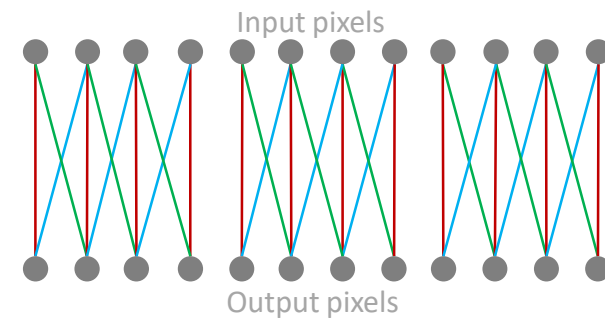
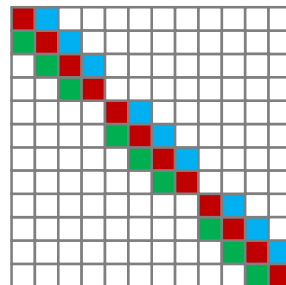
(b) Convolutional
3 x 3 square



(c) Convolutional
1 x 3 vertical



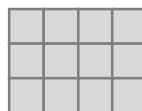
(d) Convolutional
3 x 1 horizontal



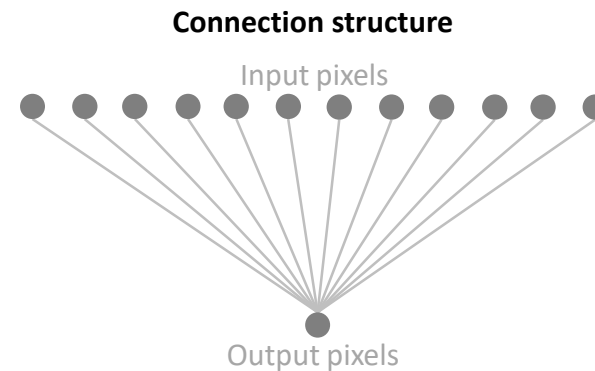
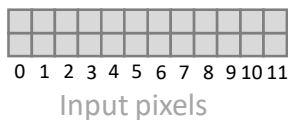
Input image
(3 x 4 pixels)

0	1	2	3
4	5	6	7
8	9	10	11

(a) **Fully connected layer structure**



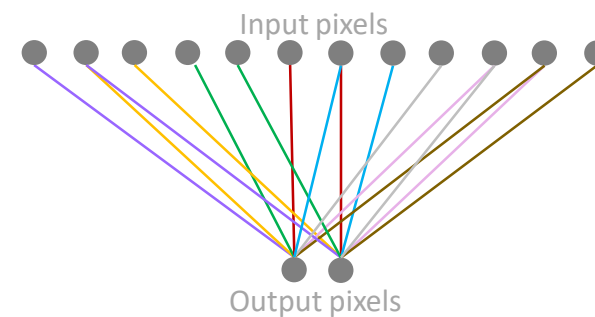
Output pixels
1 0



Output feature map

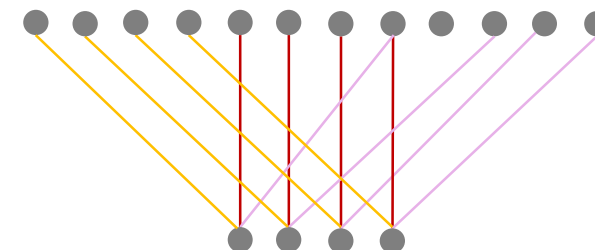
0

(b) **Convolutional full rank**



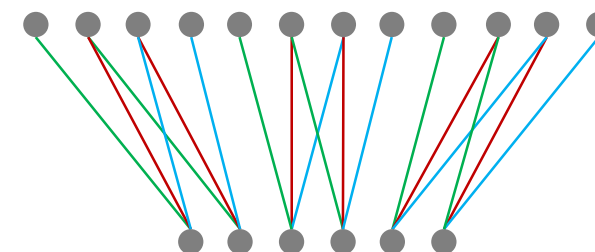
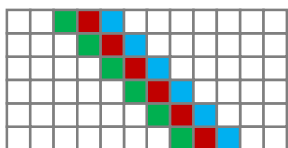
0	1
---	---

(c) **Convolutional low-rank vert.**



0	1	2	3
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(d) **Convolutional low-rank horiz.**



0	1
2	3
4	5

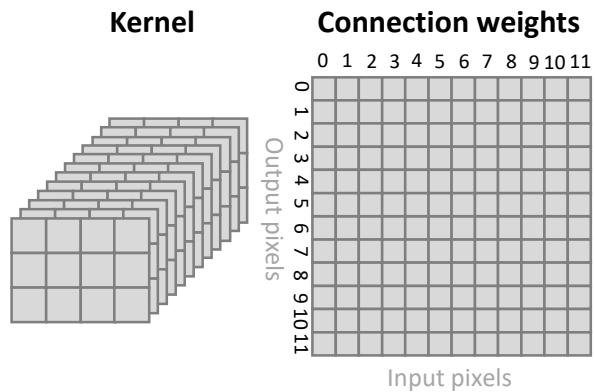
Input image
(zero-padded 3 x 4 pixels)

	0	1	2	3
	4	5	6	7
	8	9	10	11

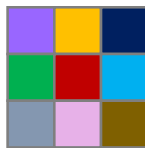
Output feature map
(4 x 3)

0	1	2	3
4	5	6	7
8	9	10	11

(a) **Fully connected layer structure**



(b) **Convolutional 3 x 3 square**



Connection structure

