Introduksjon til maskinlæring

Bildegjenkjenning med Python og Tensorflow

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I OSLO

Plan for dagen

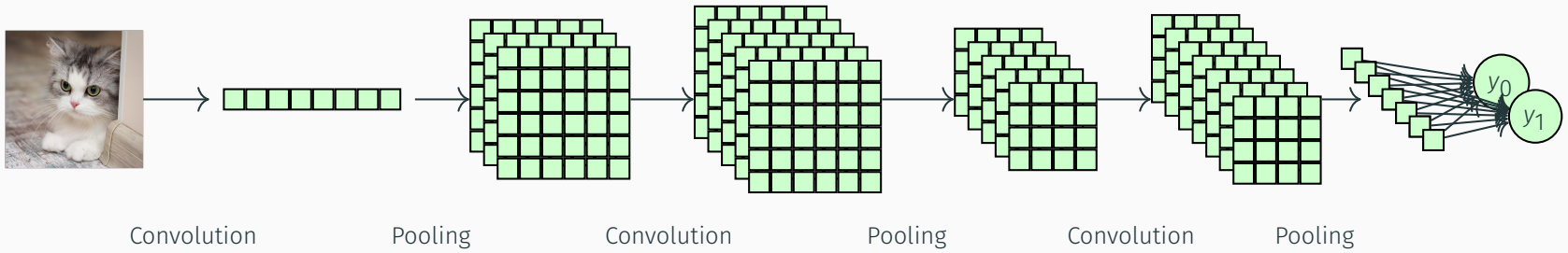
Teori:

- Hva er en statistisk læringsmodell?
- Hva er en kost-funksjon?
- Hvordan trener vi en statstisk læringsmodell?
- Hvordan fungerer et (dypt) kunstig nevralt nettverk?
- Hvordan fungerer et konvolusjonelt nevralt nettverk?
- Hva er transfer learning?
- Hva er overtilpasning, og hvordan unngår vi det?

Praktisk workshop:

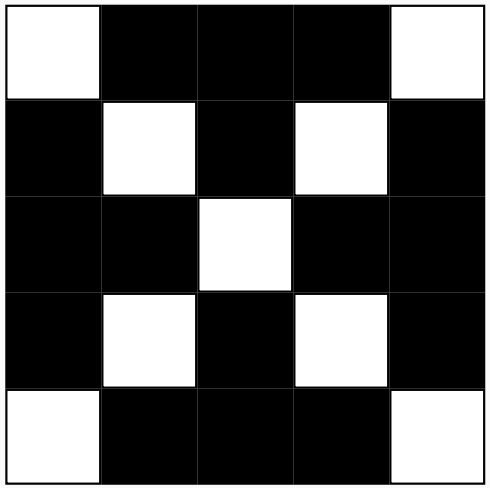
1. Sette opp et Python-miljø på Google Colab
2. Predikere med et pretrent konvolusjonelt nevralt nettverk
3. Tilpasse en klassifikator for blomsterarter
4. Hvis tid, forbedre klassifikatoren

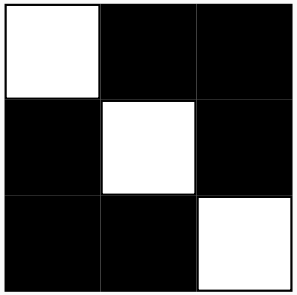
Konvolusjonelle nevrale nettverk: Arkitektur



Convolutional neural networks: Convolution

Image

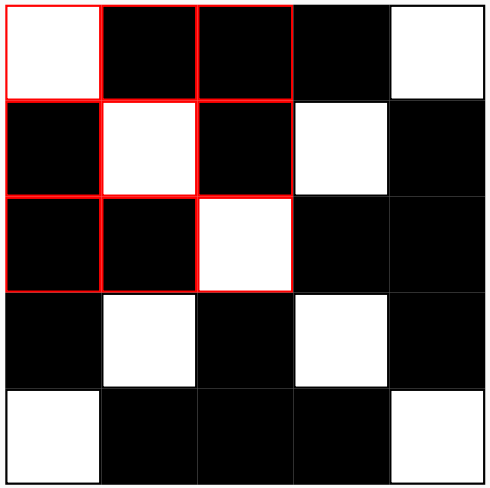




Pattern 1

Convolutional neural networks: Convolution

Image



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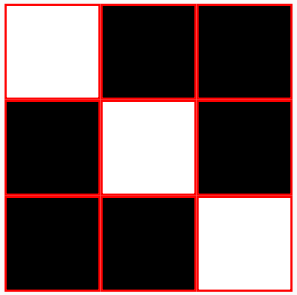

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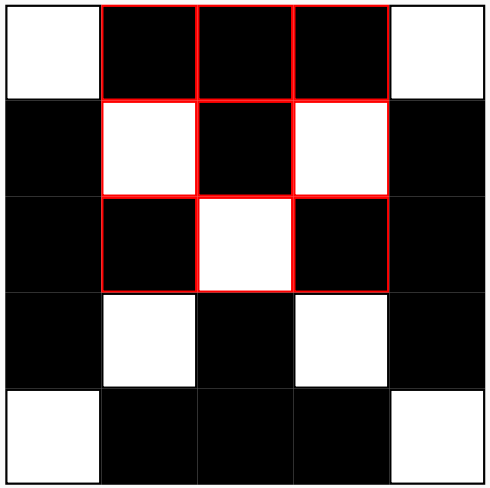

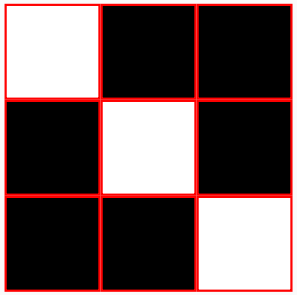

Pattern 1

3	0

Convolutional neural networks: Convolution

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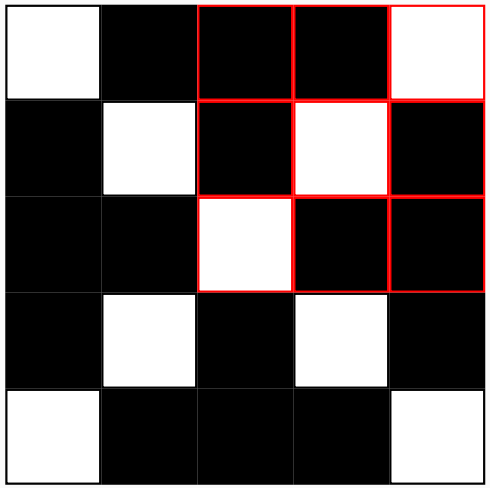
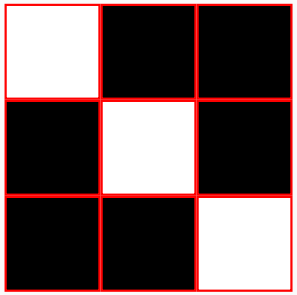


3	0	1



Pattern 1

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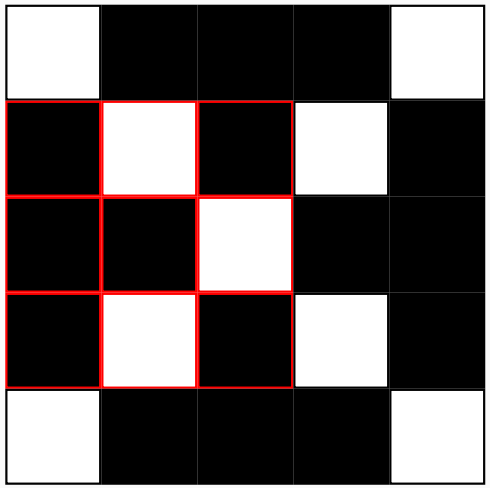
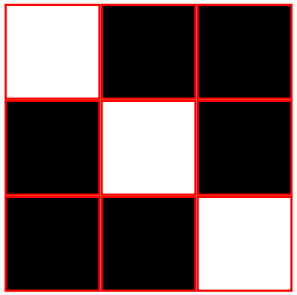


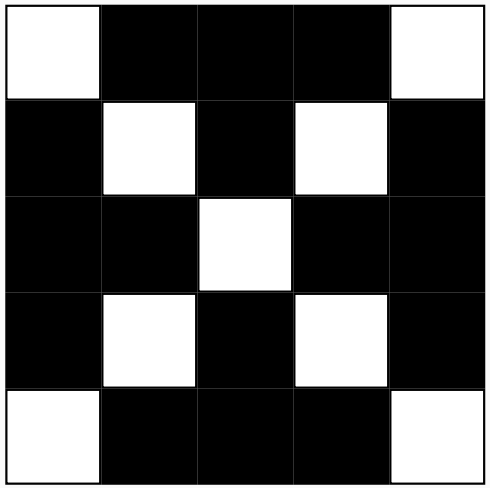


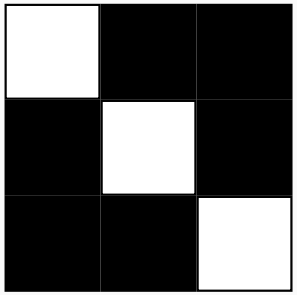
Pattern 1

3	0	1
0		

Convolutional neural networks: Convolution

Image



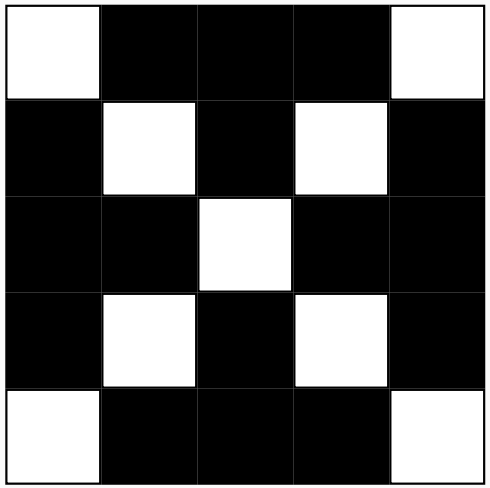


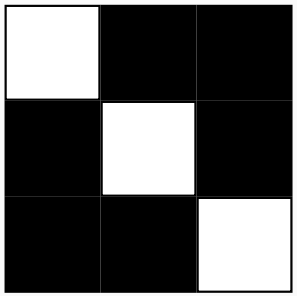
Pattern 1

3	0	1
0	3	0
1	0	3

Convolutional neural networks: Convolution

Image





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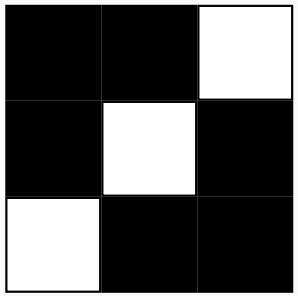

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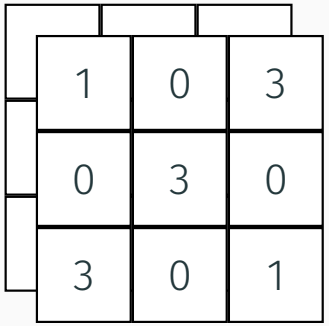
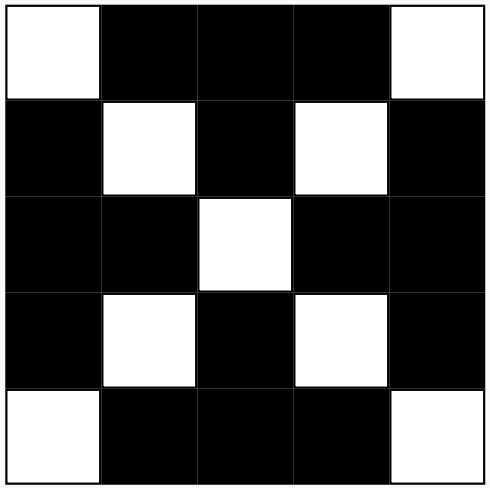
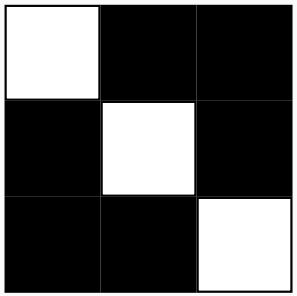


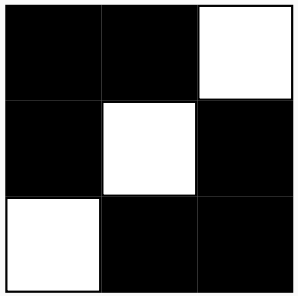
Convolutional neural networks: Convolution

Image





Pattern 1



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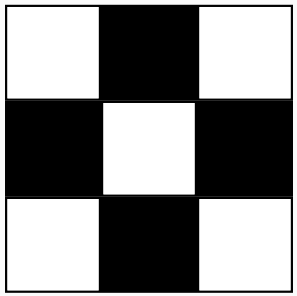

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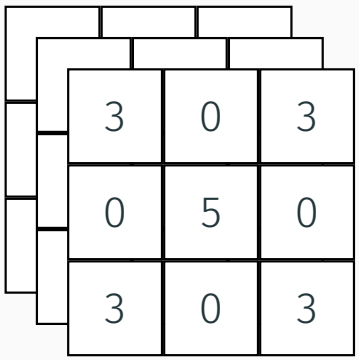
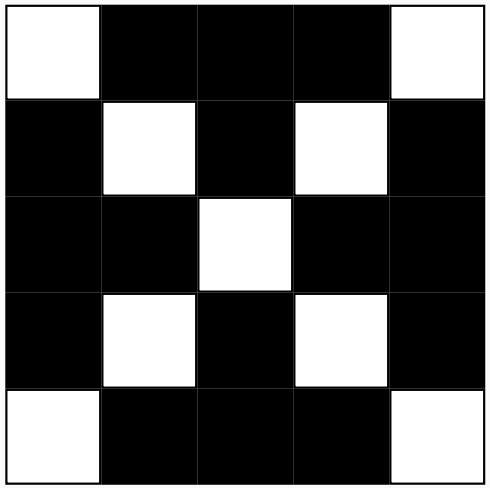
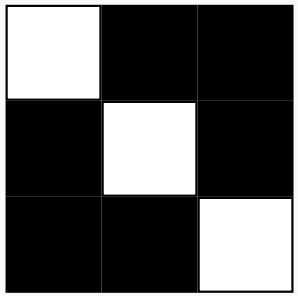


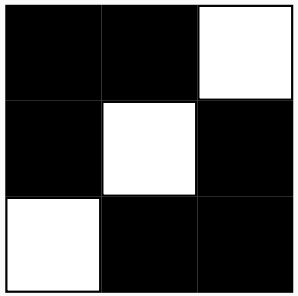
Convolutional neural networks: Convolution

Image





Pattern 1



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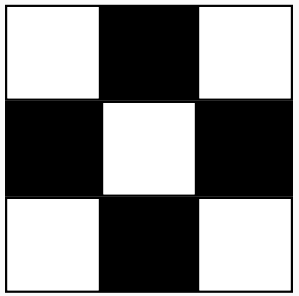
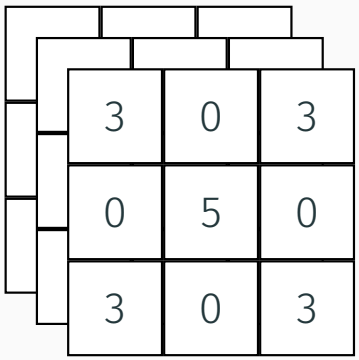


Pattern 3

Feature maps



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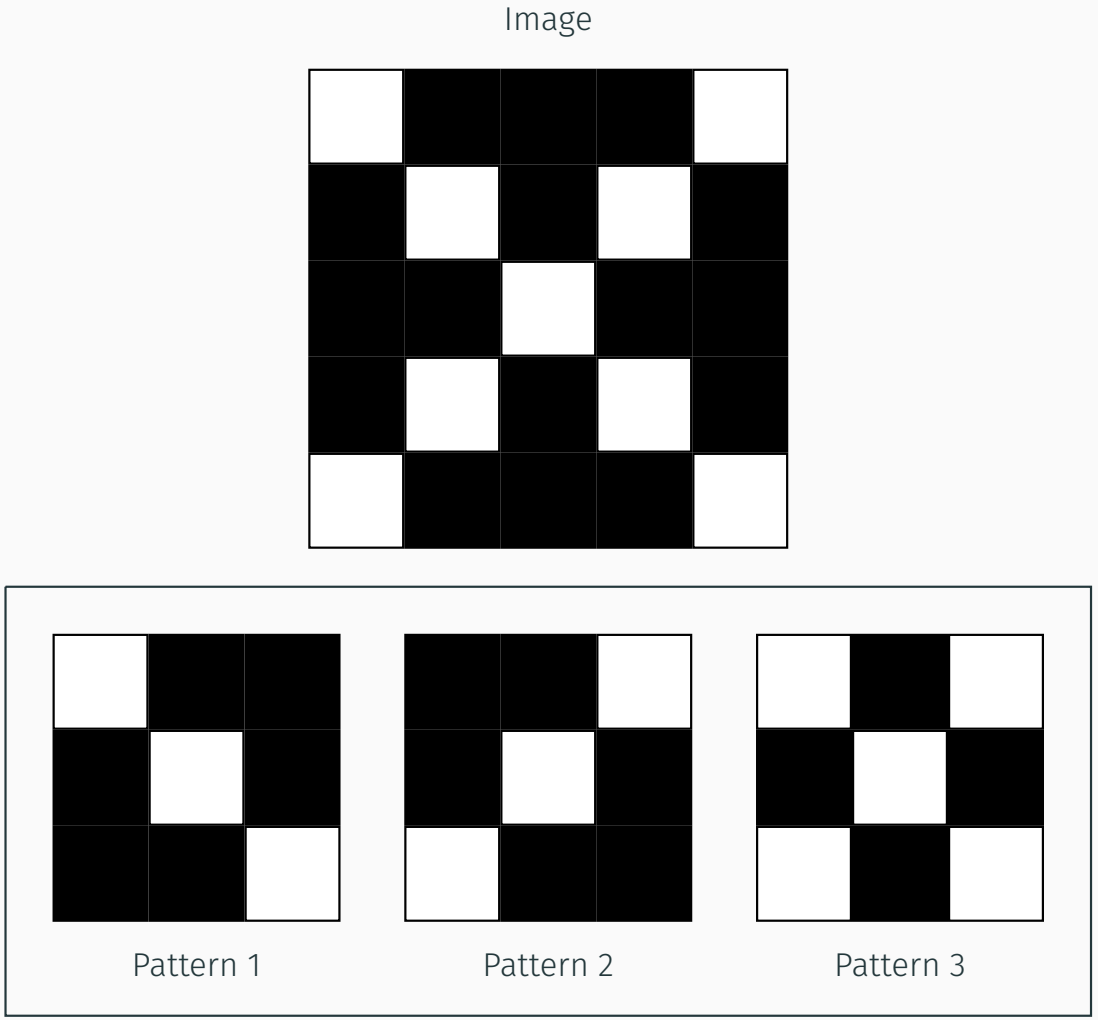
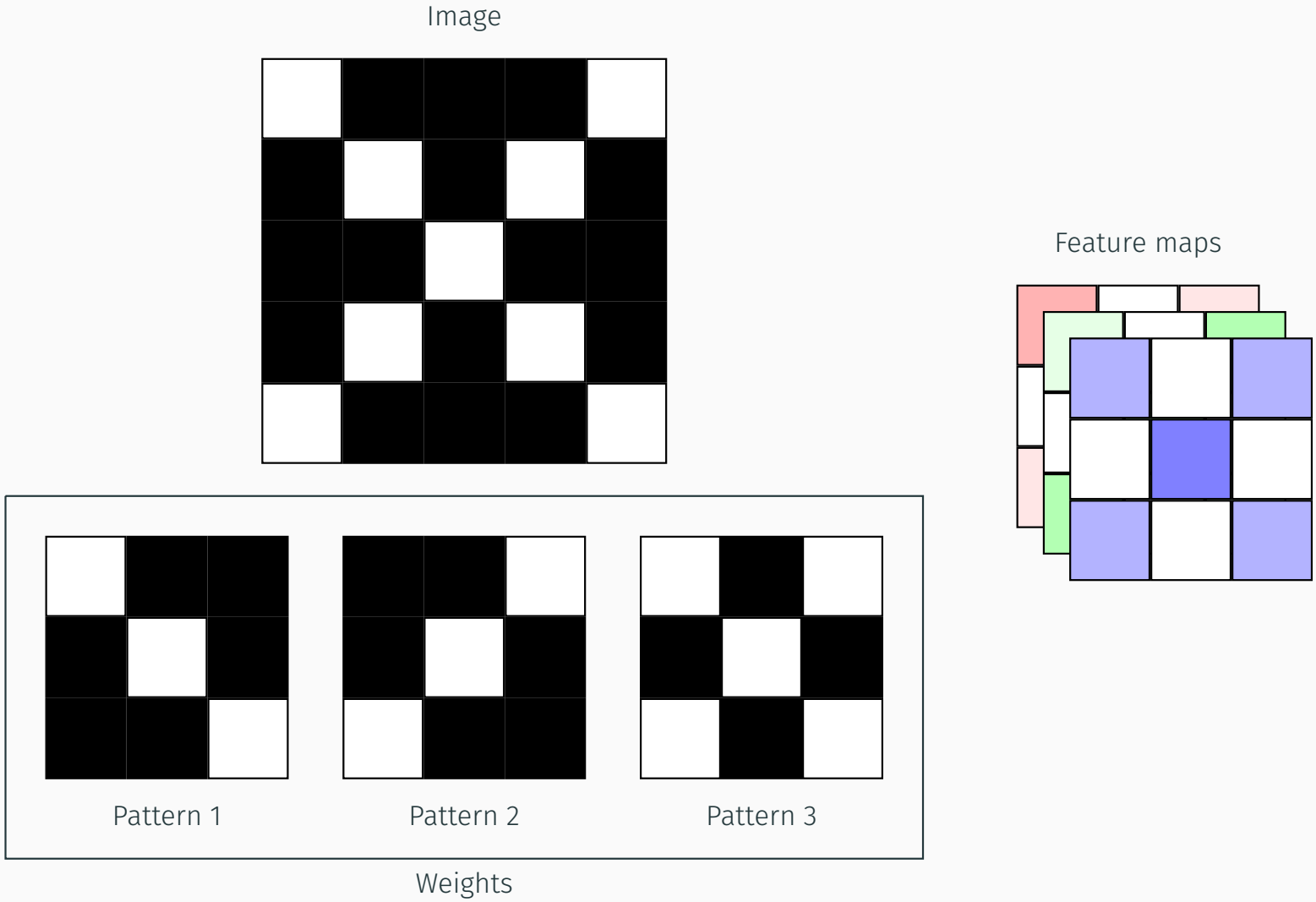


Convolutional neural networks: Convolution



Convolutional neural networks: Pooling

Feature map

0	1	2	3
4	5	6	7
8	9	10	11
12	13	14	15

Convolutional neural networks: Pooling

Feature map

0	1	2	3
4	5	6	7
8	9	10	11
12	13	14	15

5

Convolutional neural networks: Pooling

Feature map

0	1	2	3
4	5	6	7
8	9	10	11
12	13	14	15

5	7

Convolutional neural networks: Pooling

Feature map

0	1	2	3
4	5	6	7
8	9	10	11
12	13	14	15

5	7
13	

Convolutional neural networks: Pooling

Feature map

0	1	2	3
4	5	6	7
8	9	10	11
12	13	14	15

5	7
13	15

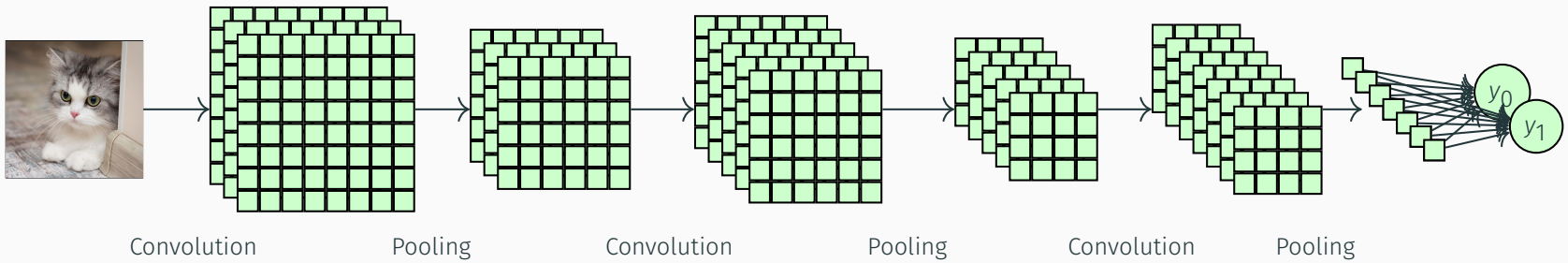
Convolutional neural networks: Pooling

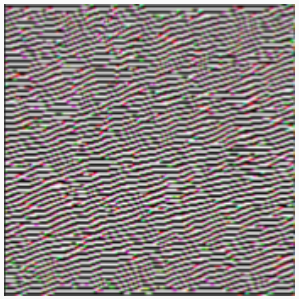
Feature map

0	1	2	3
4	5	6	7
8	9	10	11
12	13	14	15

5	7
13	15

Convolutional neural networks: Architecture





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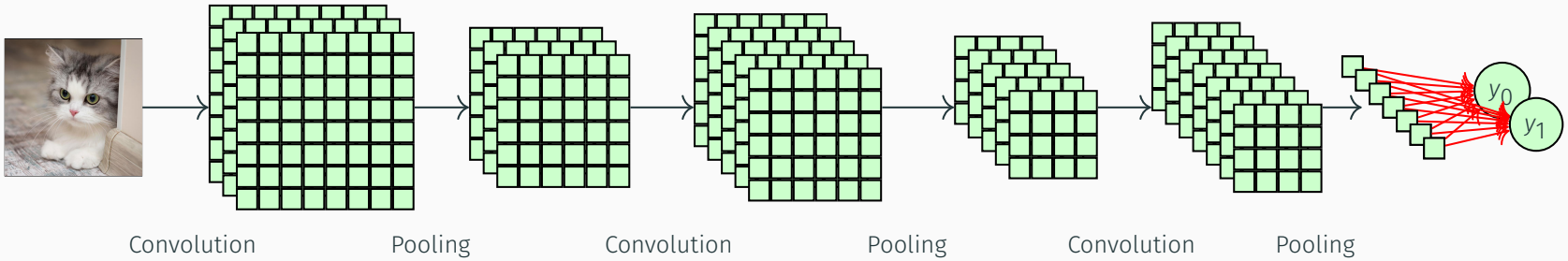

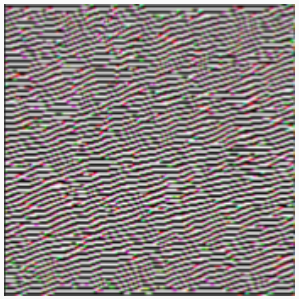

Convolutional neural networks: Architecture