

COMPUTATIONAL

ASTROPHYSICS

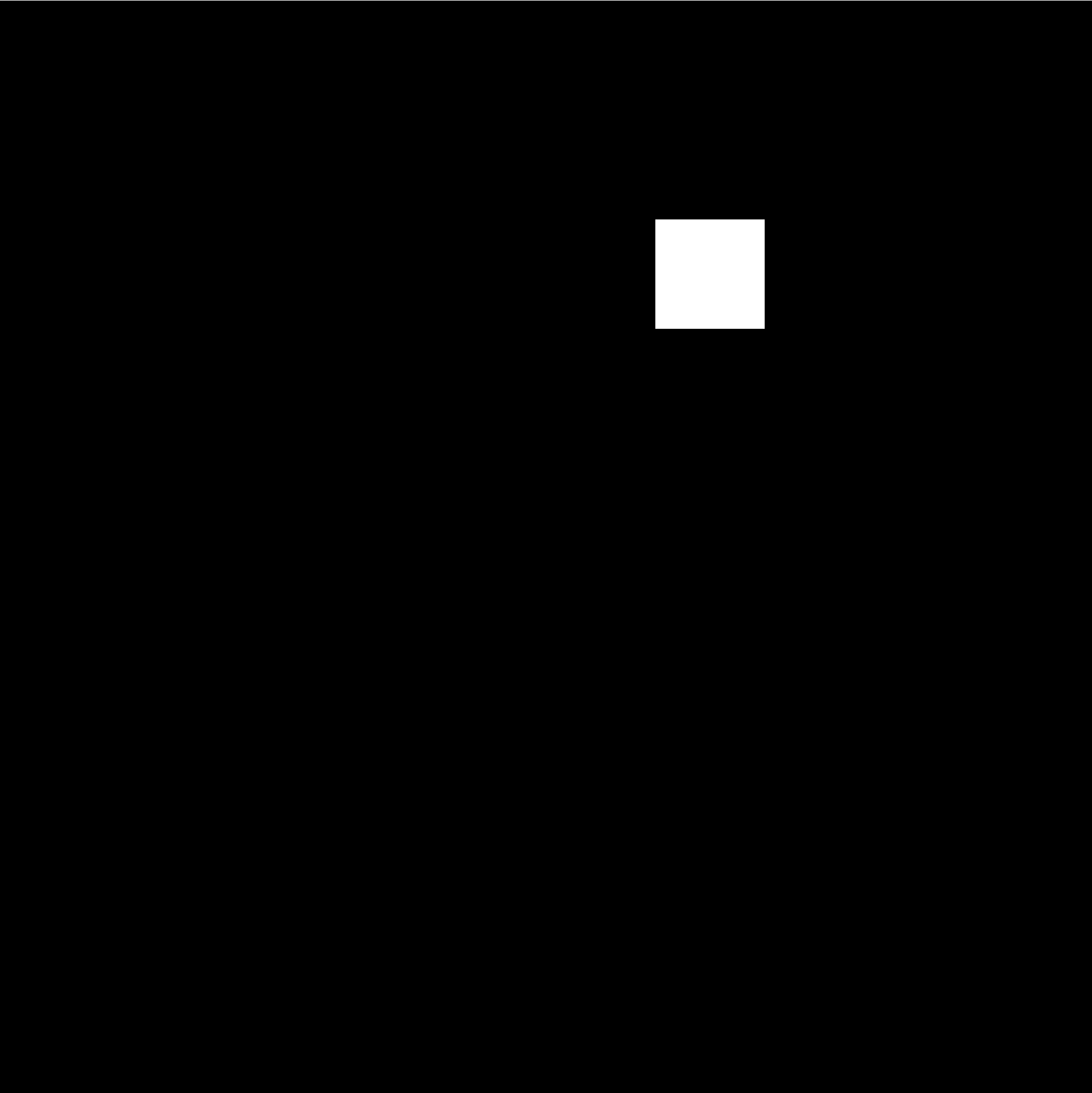
Observatorio
Astronómico
Nacional

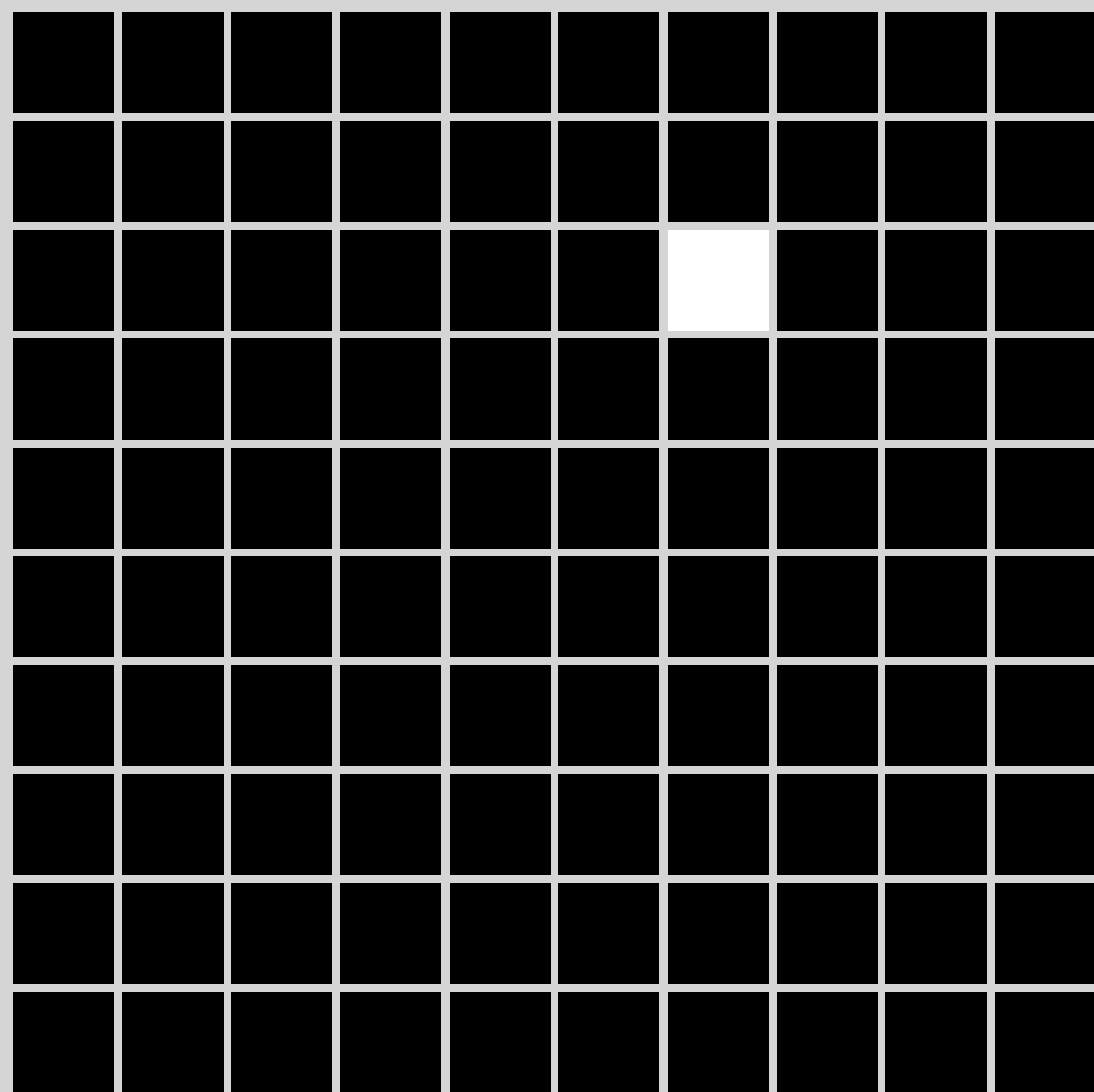
Computational Astrophysics

13. Neural Networks. Image Classification

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Star field

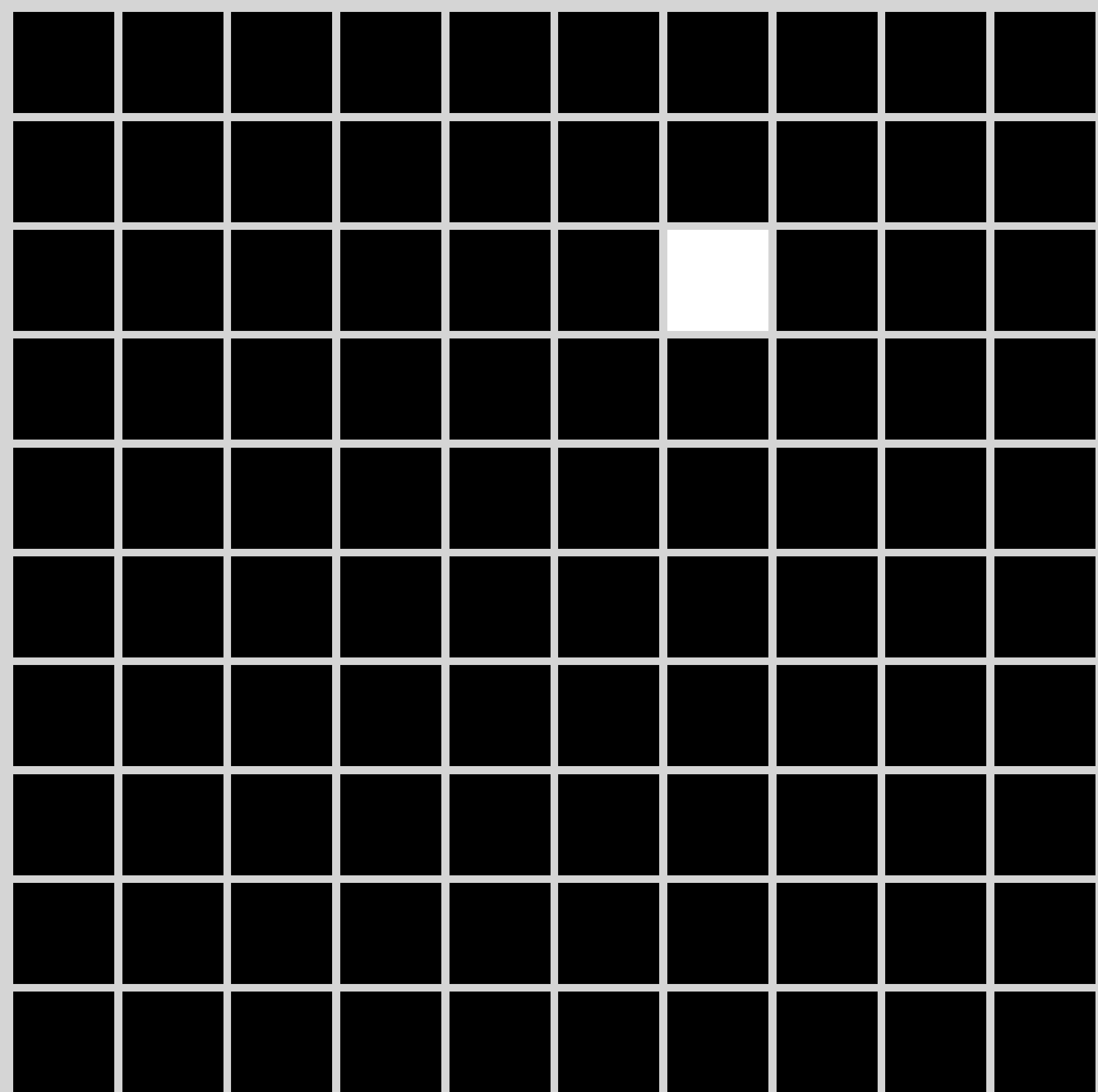


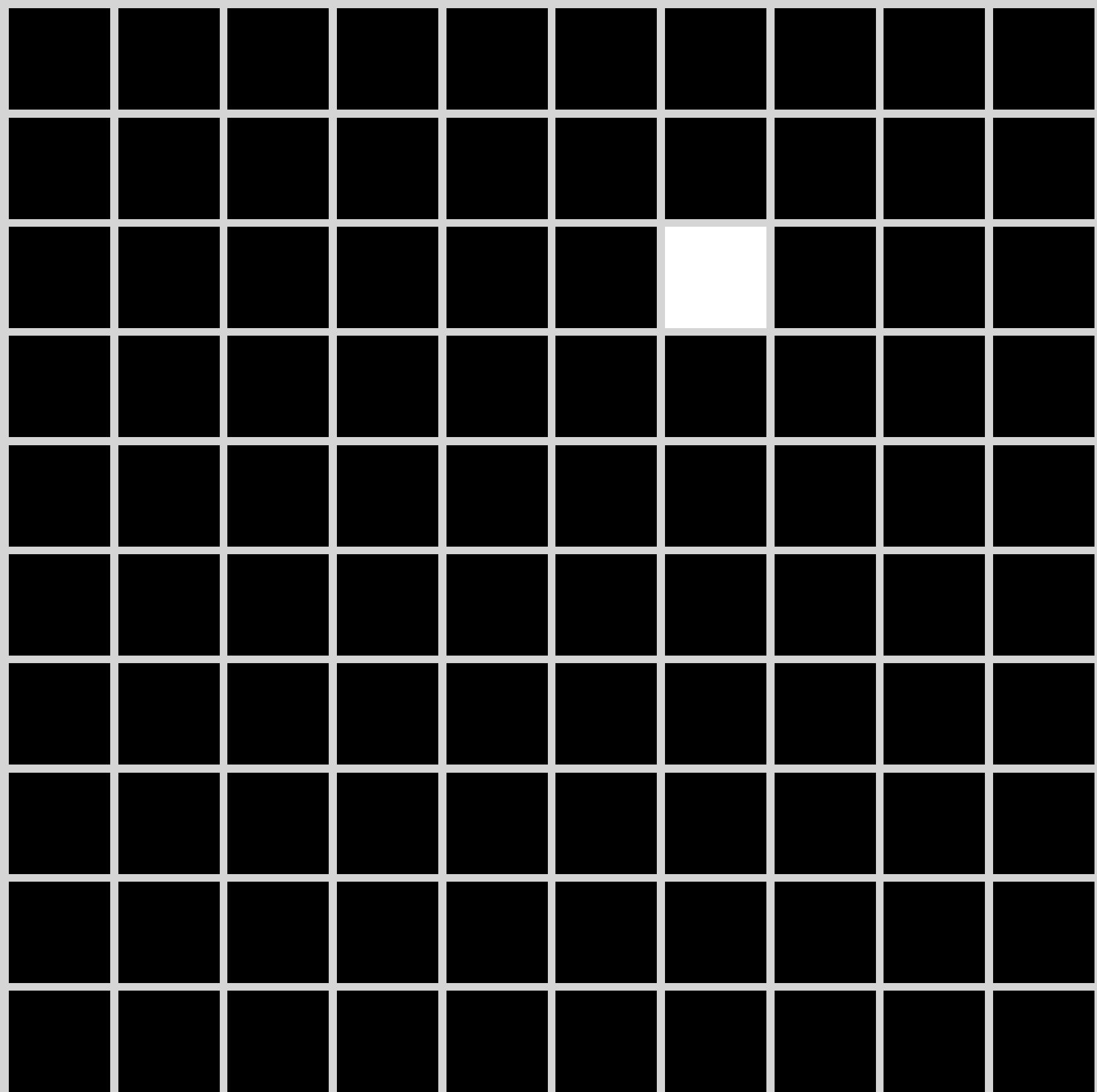


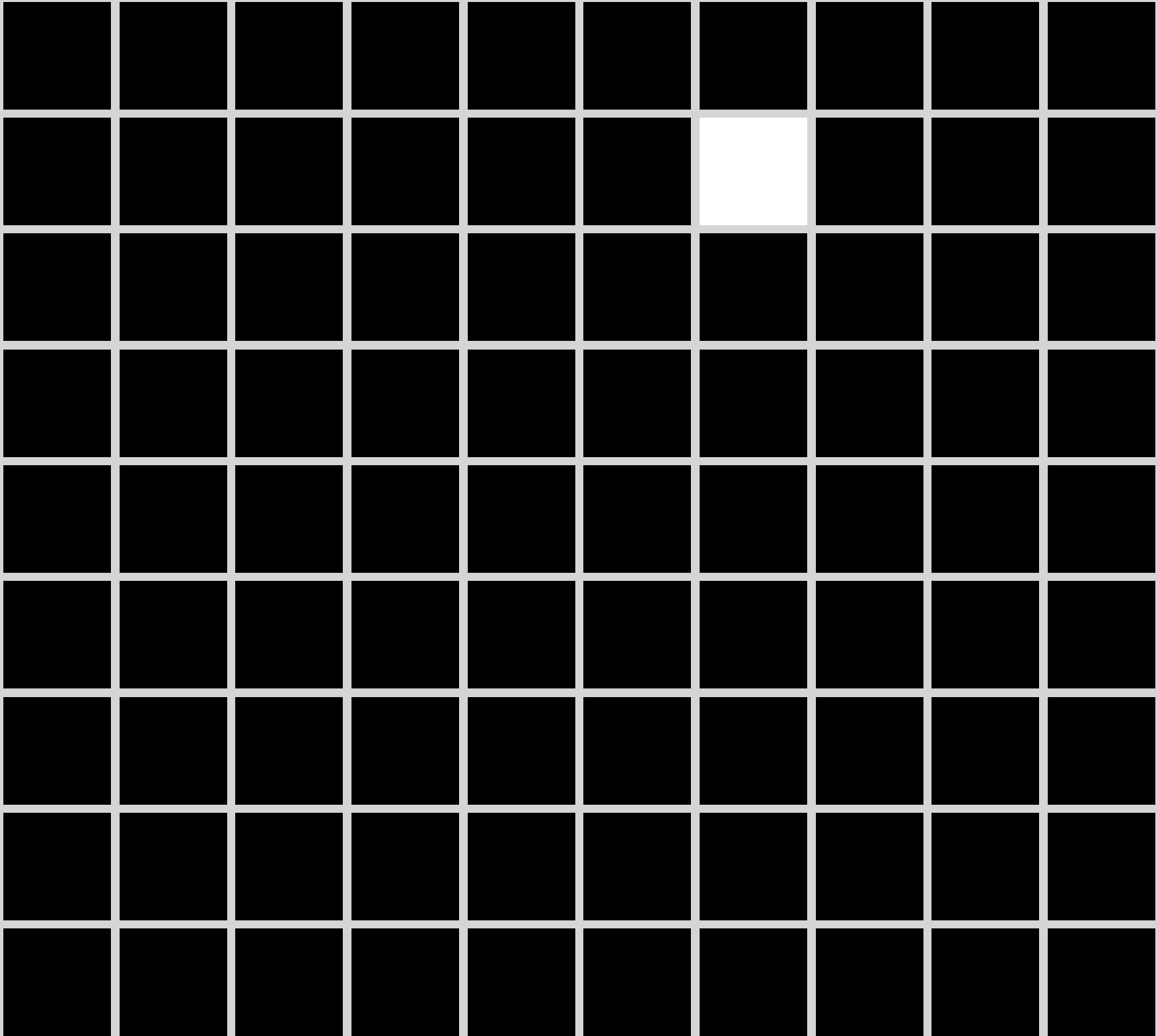
Flatten Layer

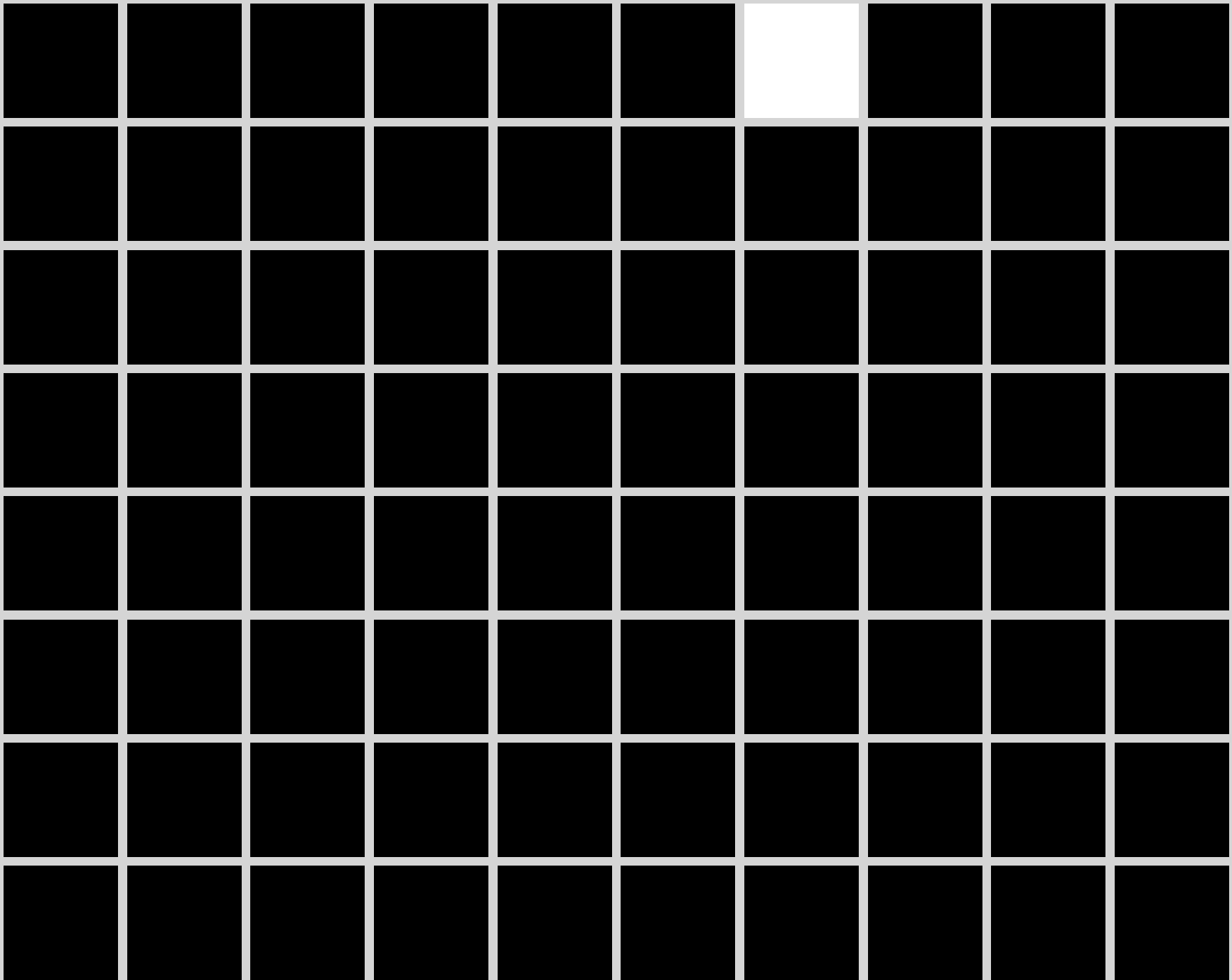
Flattens the input information in the form of a 1-dimensional vector.

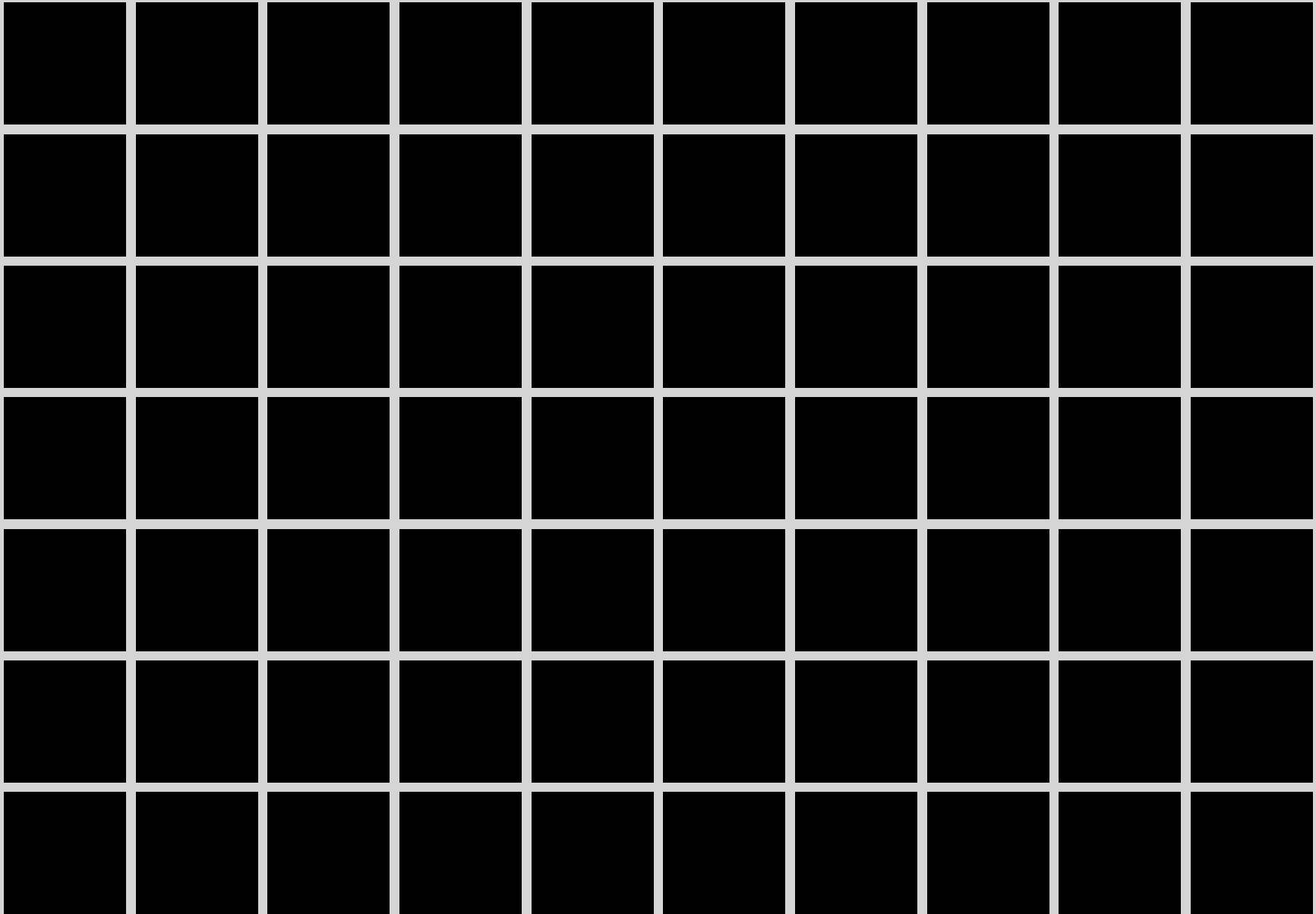
If the input is the data from an image of 28x28 pixels, this layer will convert it into a vector with 784 components.













1 star



1 star



2 stars

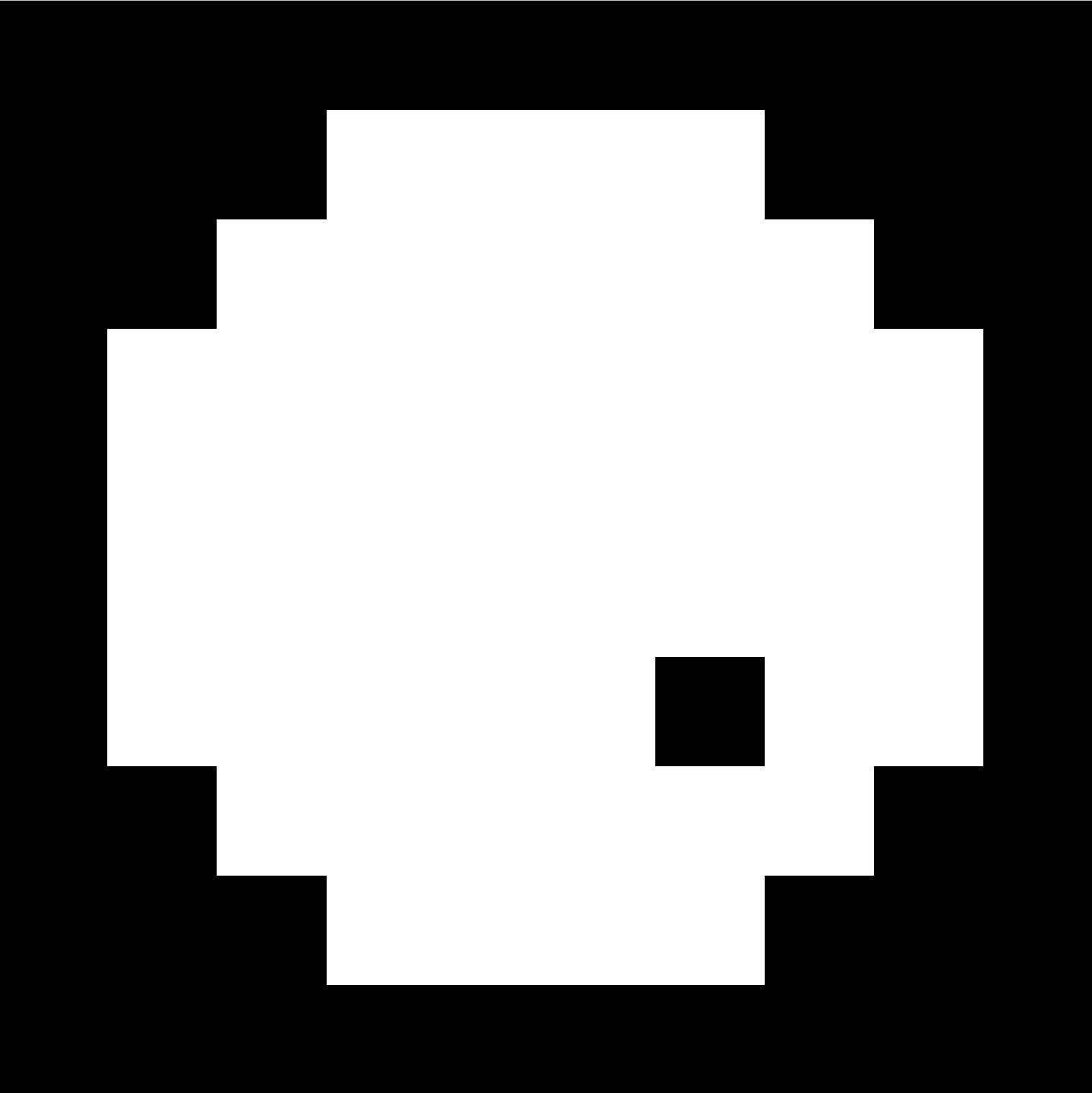


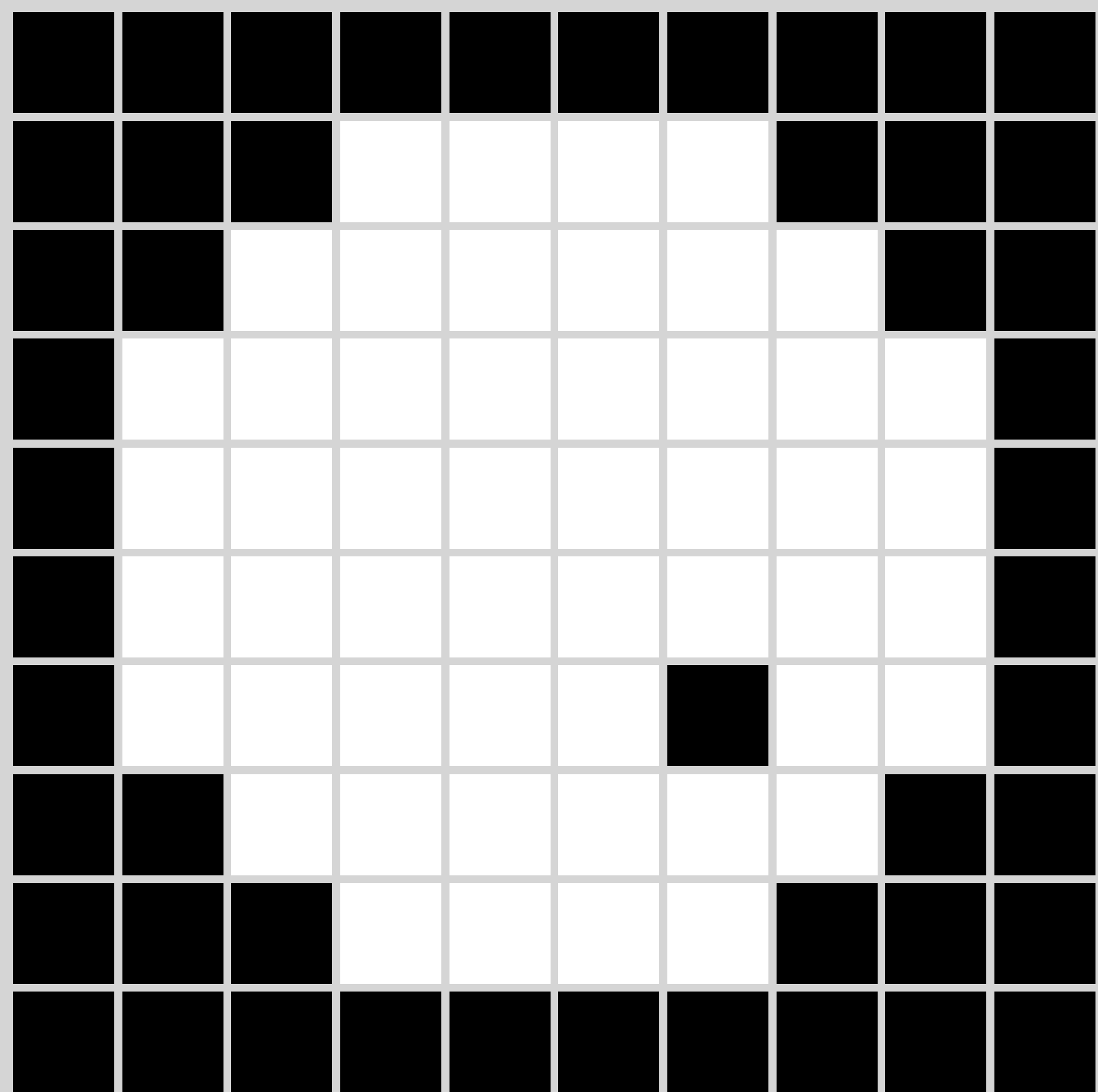
3 stars

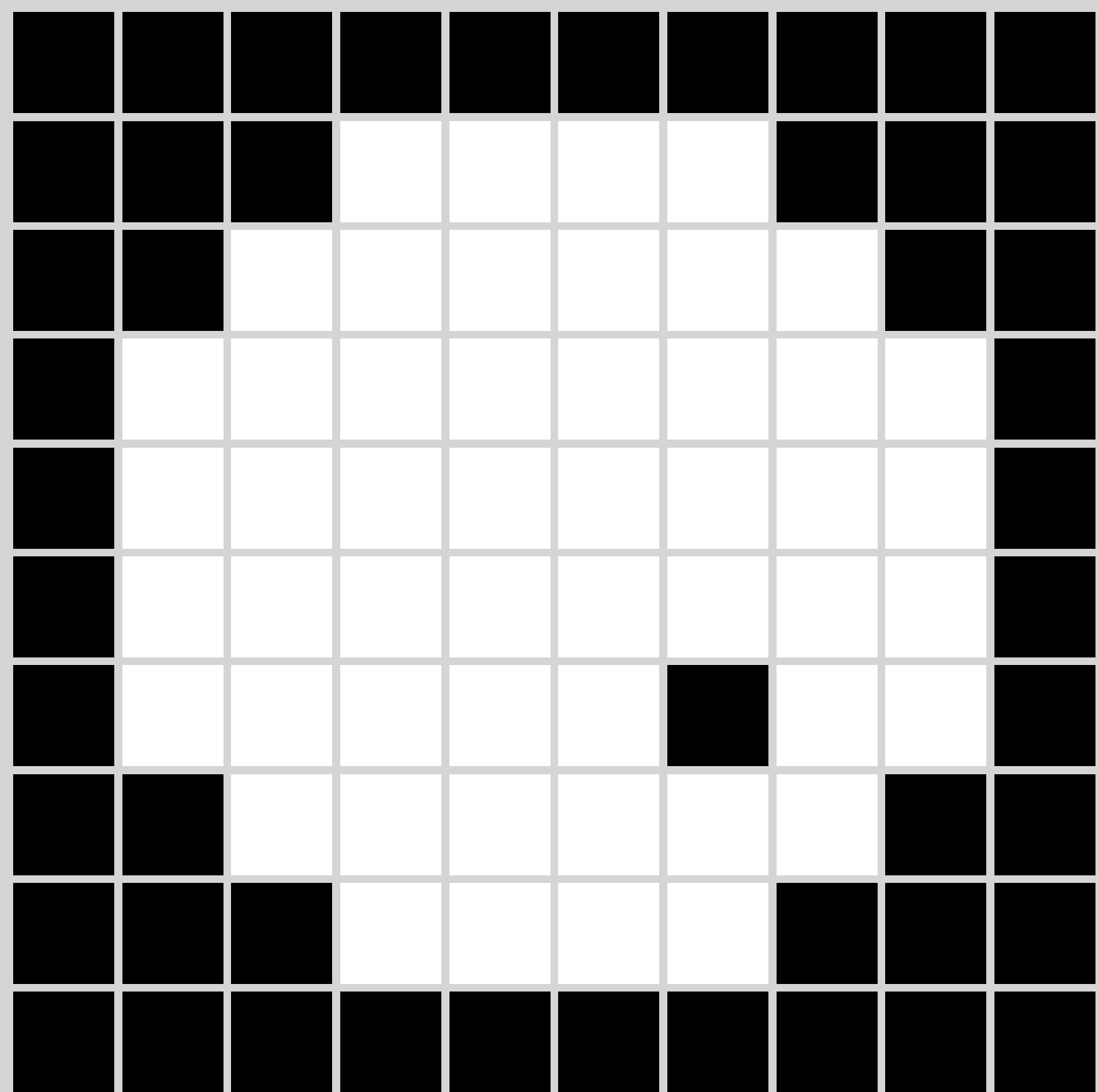


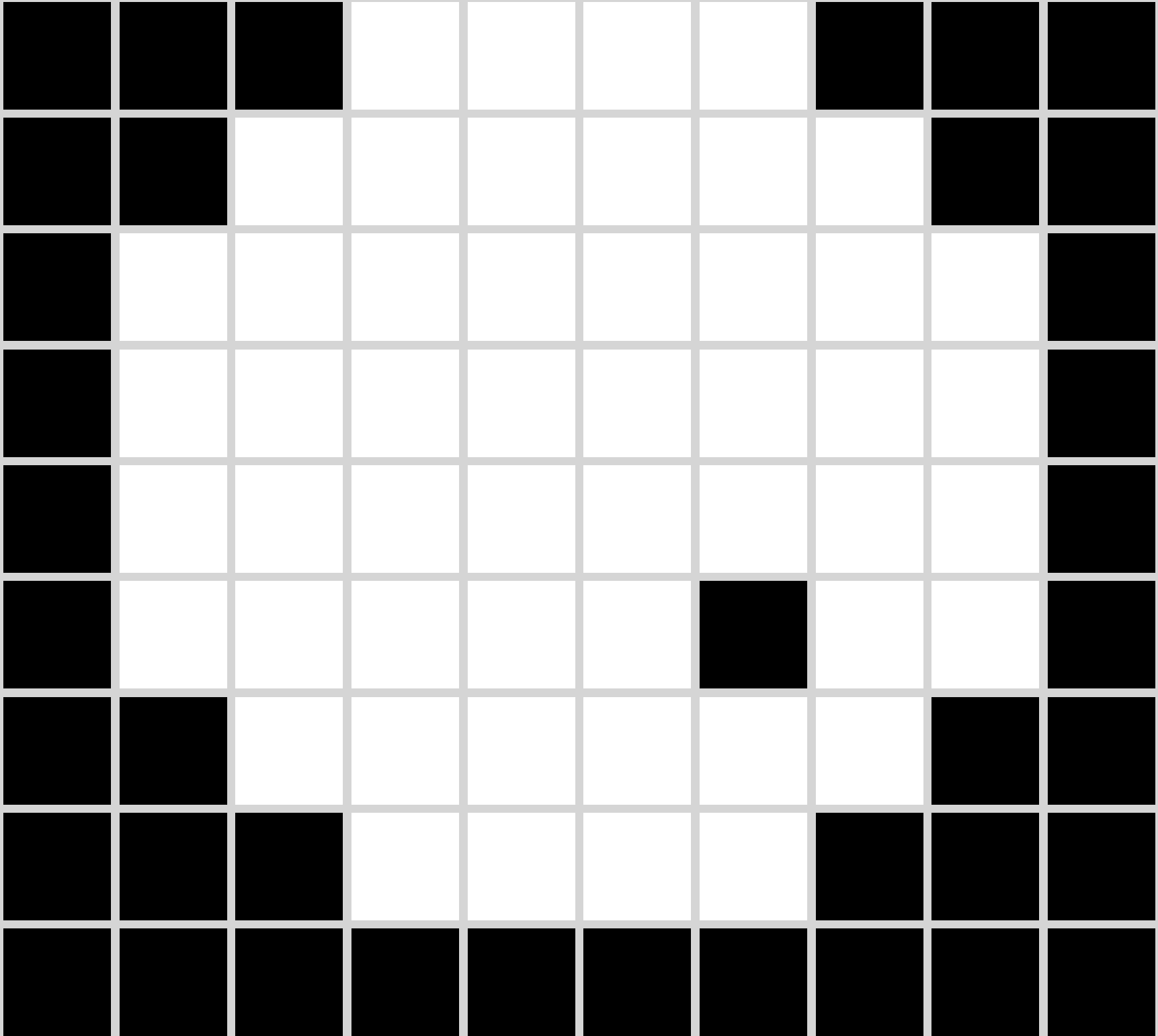
4 stars

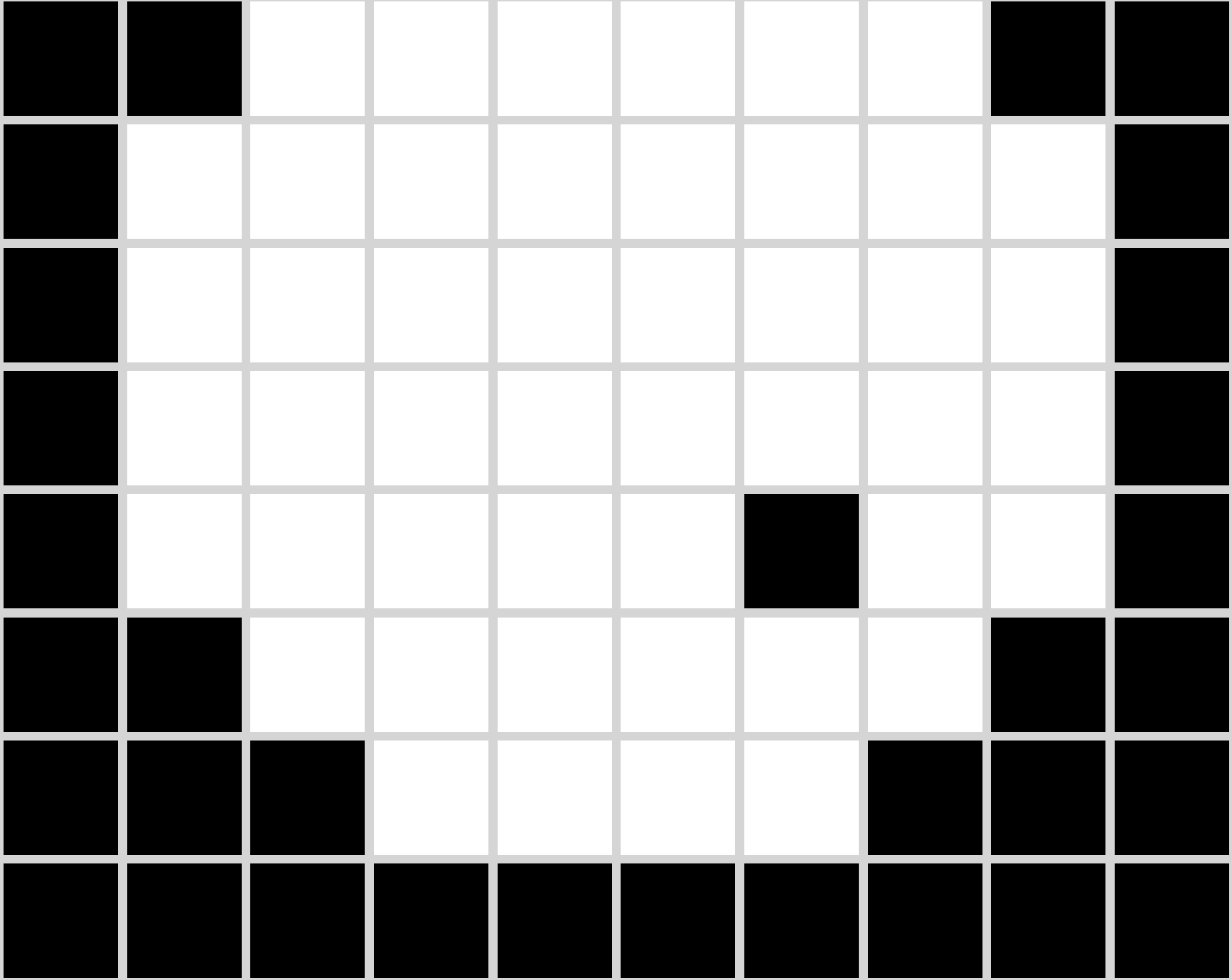
Sunspots

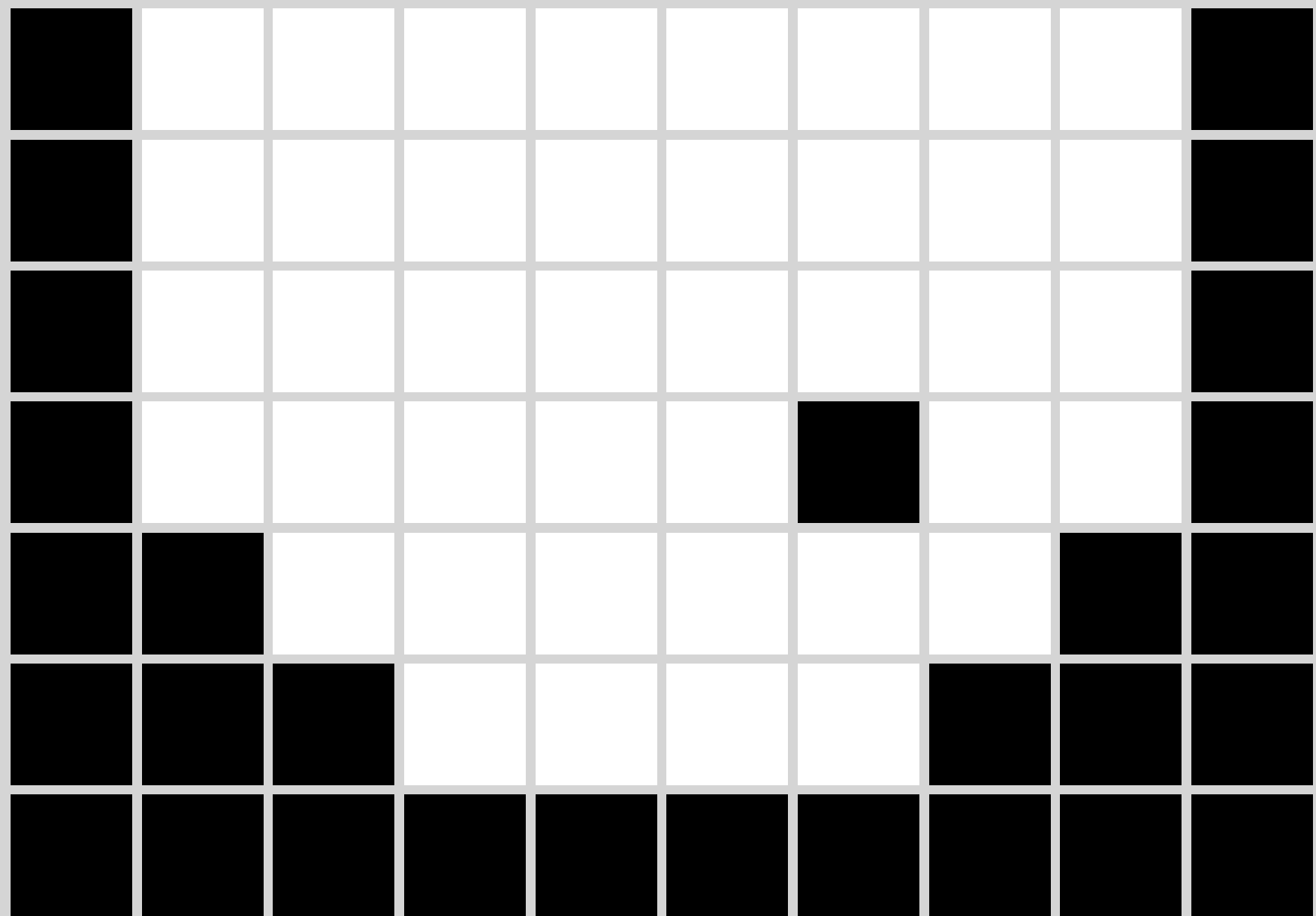
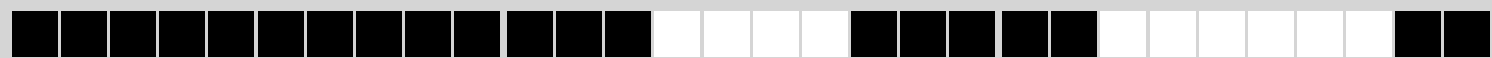














1 spot



1 spot



2 spots

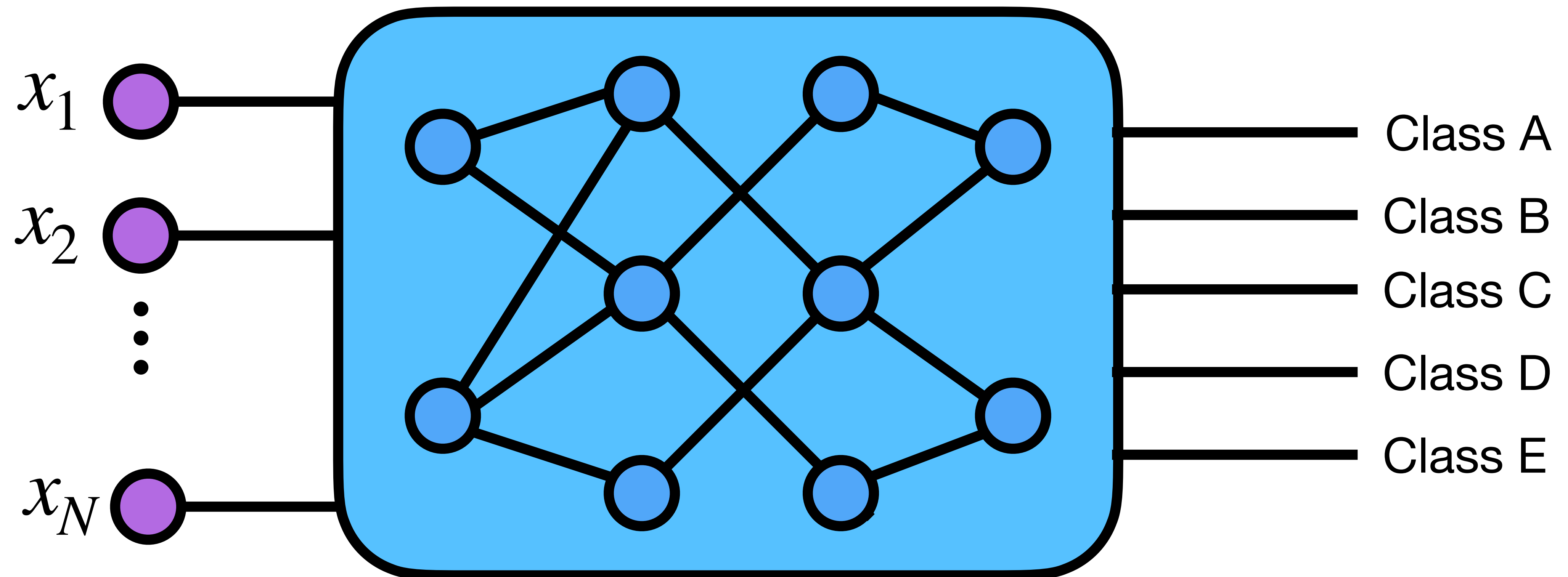


3 spots



4 spots

Classification Neural Network



Codification

One Hot Encoding

Class A	→	0	→	[10000]
Class B	→	1	→	[01000]
Class C	→	2	→	[00100]
Class D	→	3	→	[00010]
Class E	→	4	→	[00001]

SparseCategoricalCrossEntropy

CategoricalCrossEntropy

$$H = - \sum_{i=1}^N y_i \log[y_i^p]$$



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