Applying Classification Models to Images

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Overview

Modeling images as numeric features

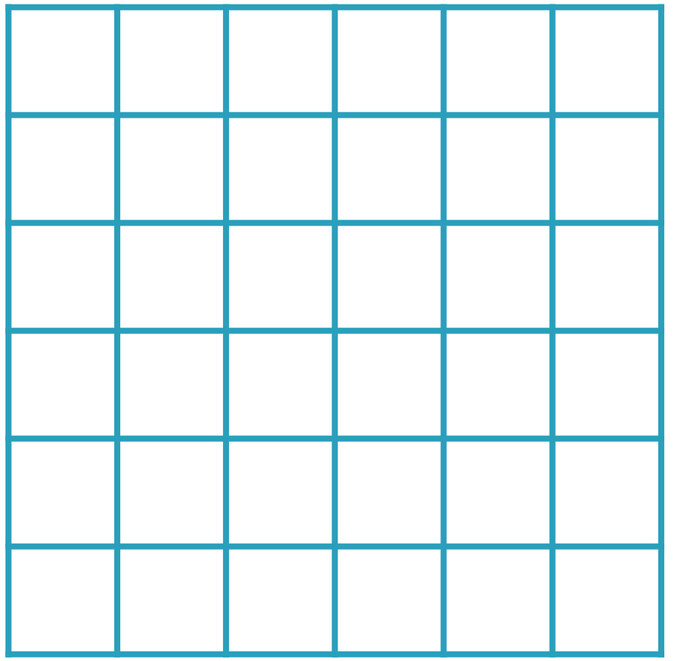
Using binary classifiers for multi-class classification

Multi-class classification on image data

Working with Images

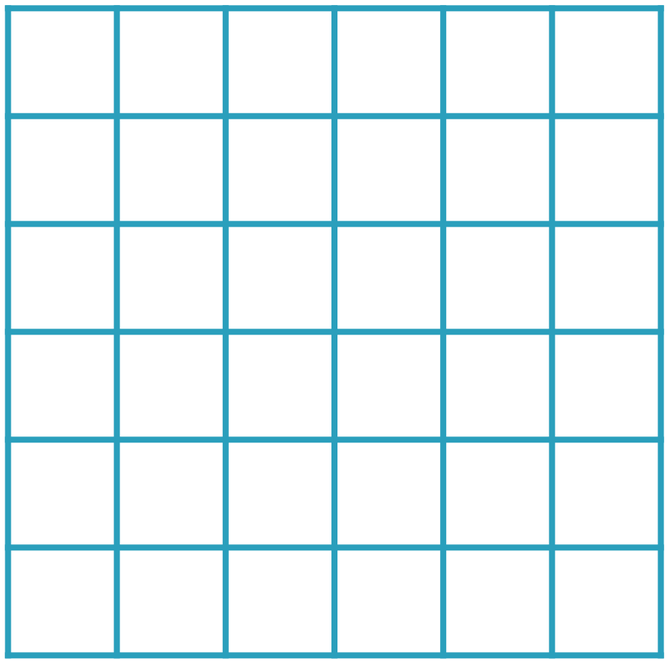
Image as a Matrix

Image as a Matrix



Each pixel holds a value based on the type of image

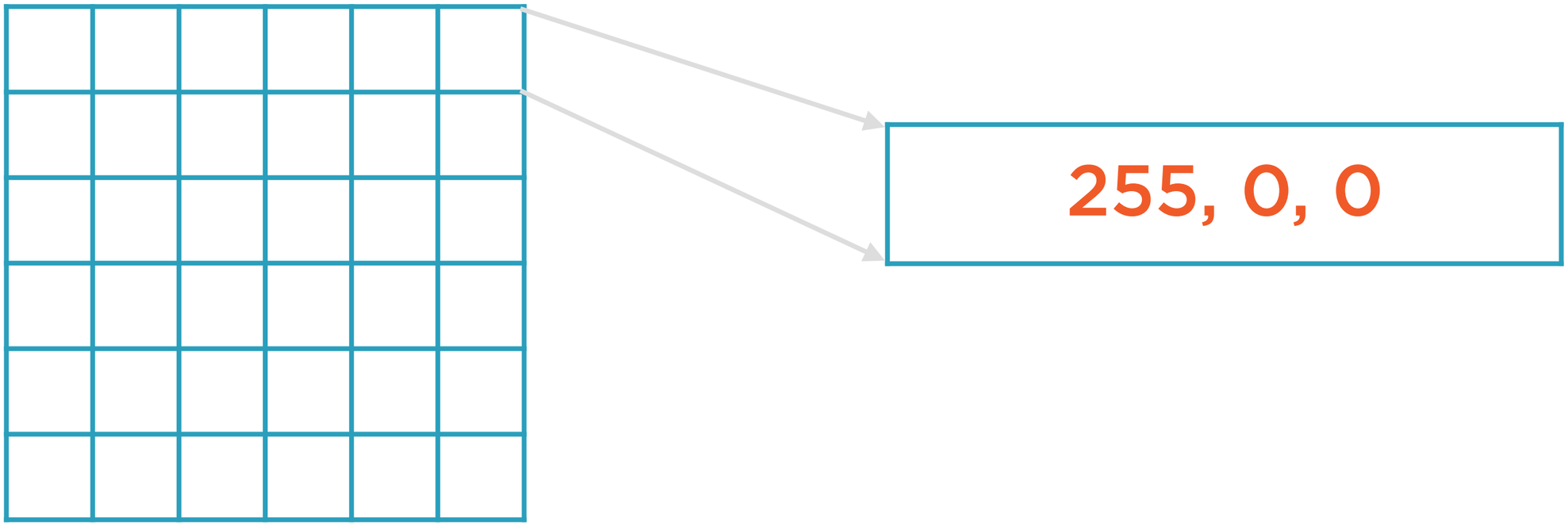
RGB Images



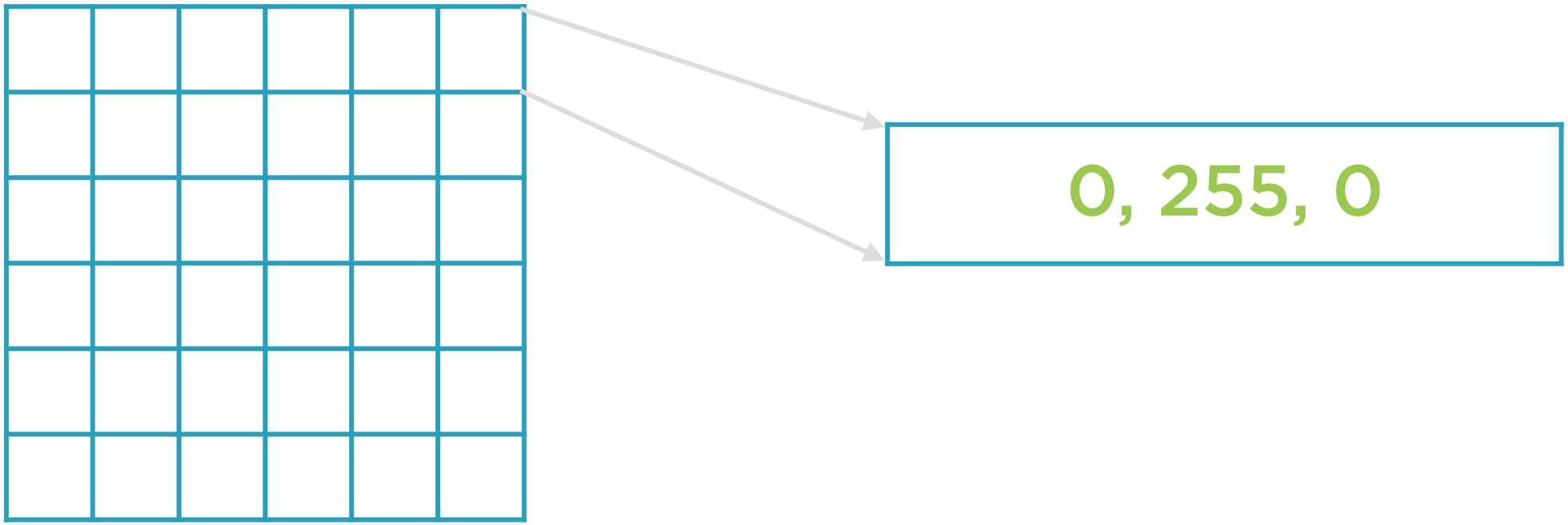
RGB values are for color images

R, G, B: 0-255

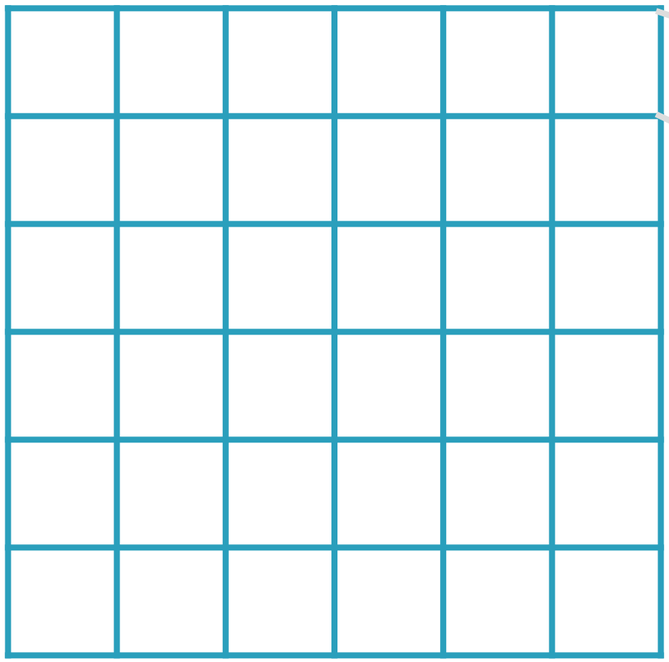
RGB Images



RGB Images



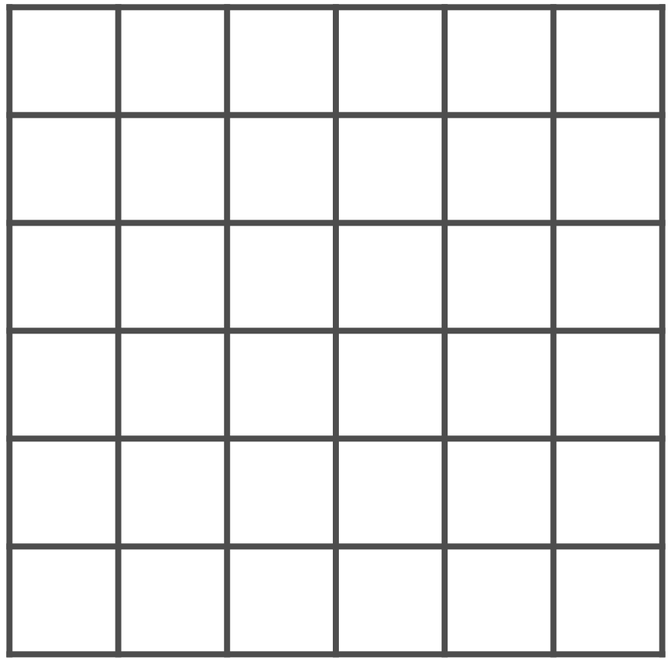
RGB Images



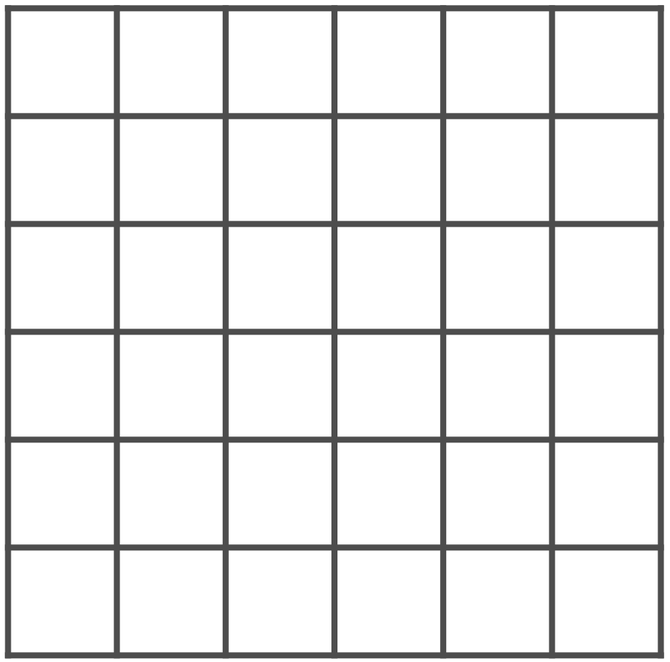
0, 0, 255

3 values to represent color, 3 channels

Grayscale Images



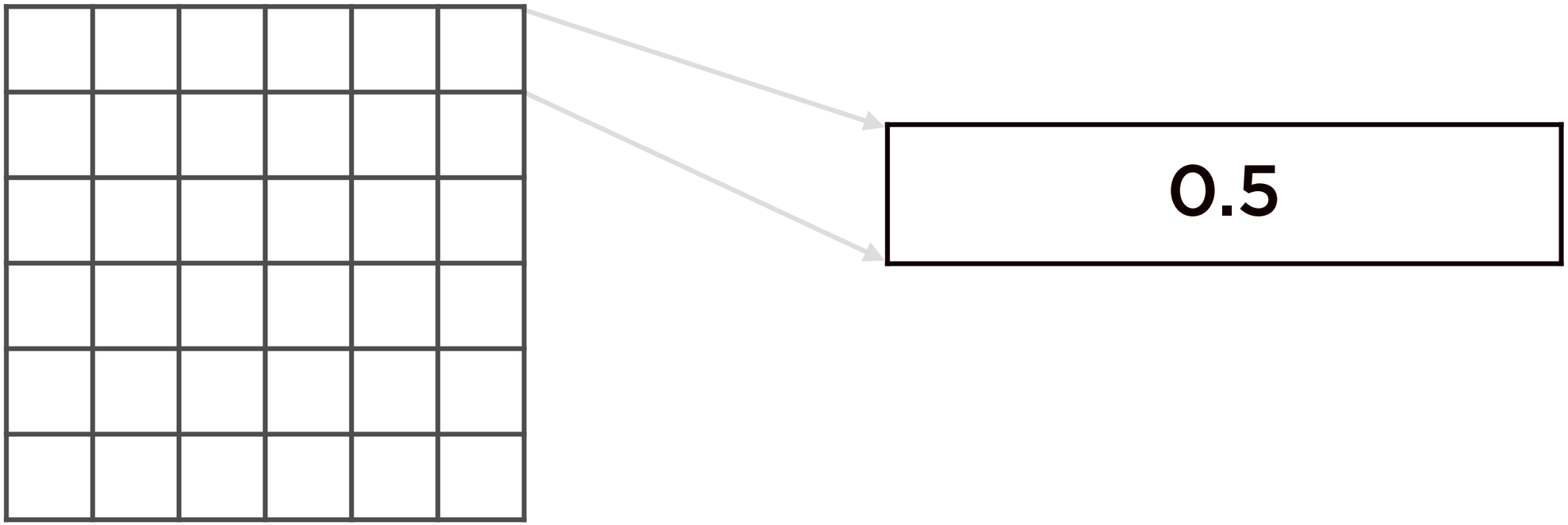
Grayscale Images



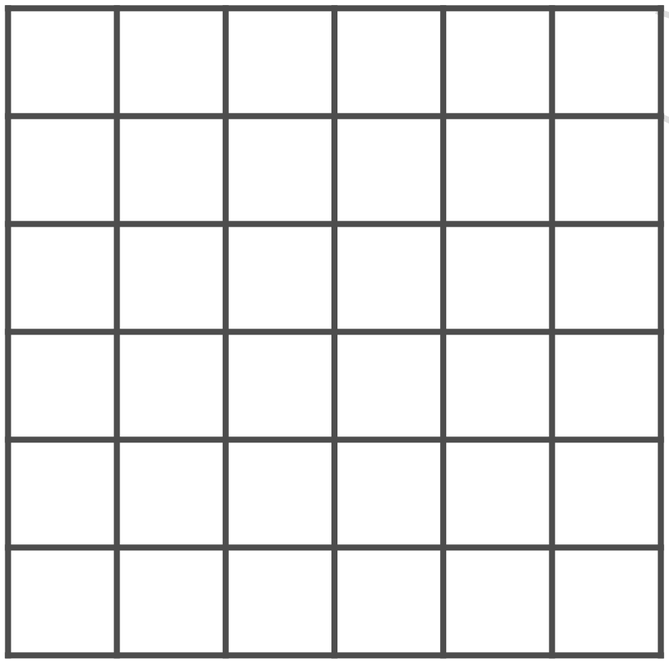
Each pixel represents only intensity information

0.0 - 1.0

Grayscale Images



Grayscale Images

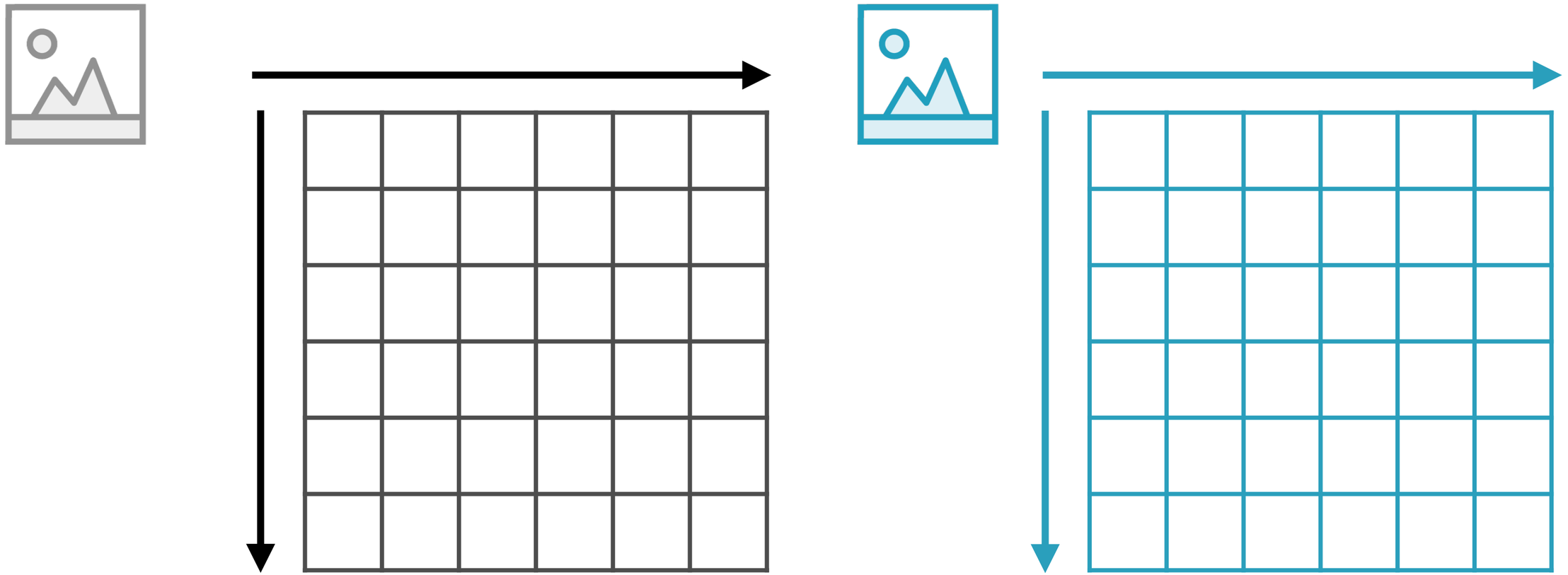


1 value to represent intensity, 1 channel

Image as a Matrix

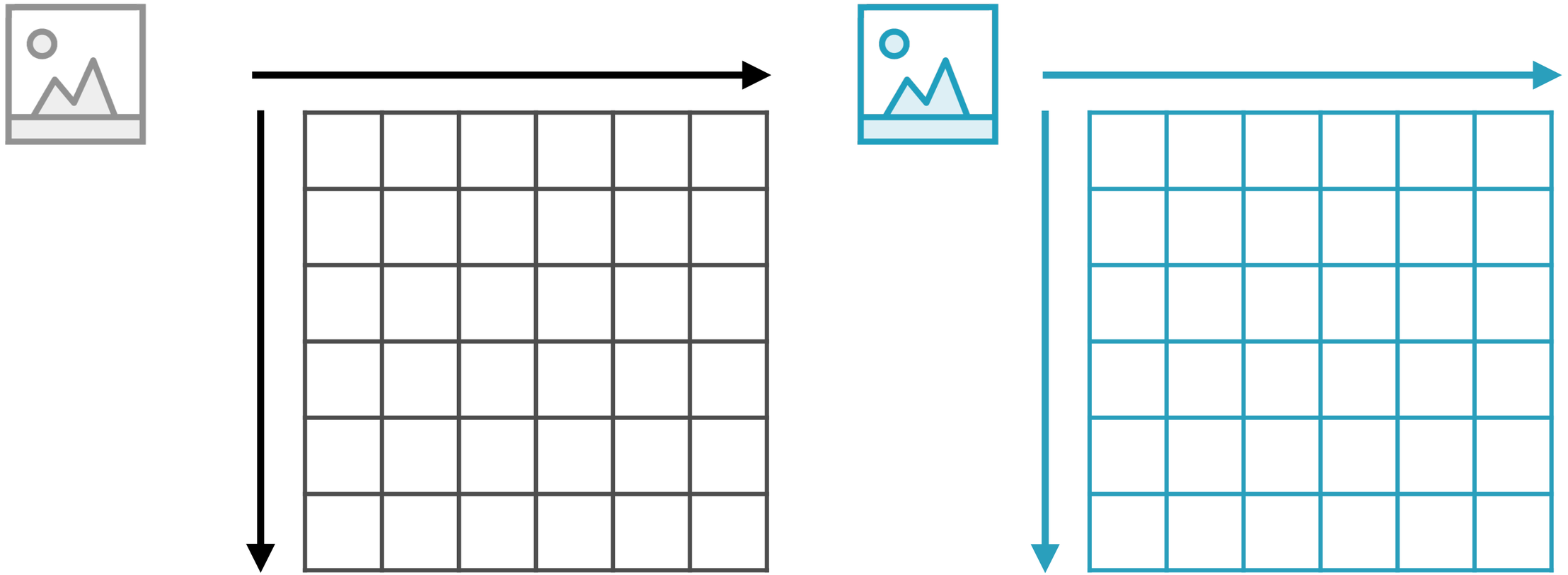
Single channel and multi-channel images

Image as a Matrix



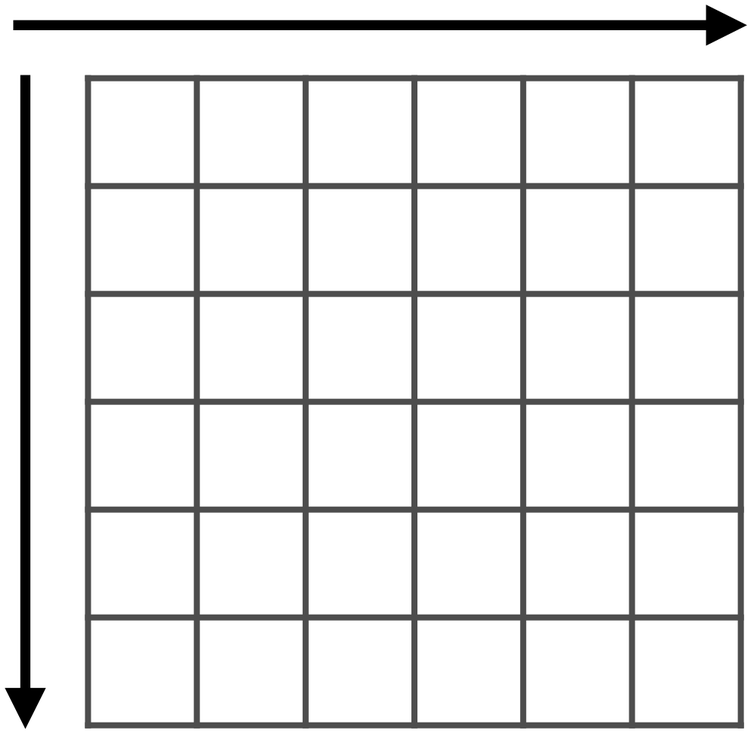
Images can be represented by a 3-D matrix

Image as a Matrix

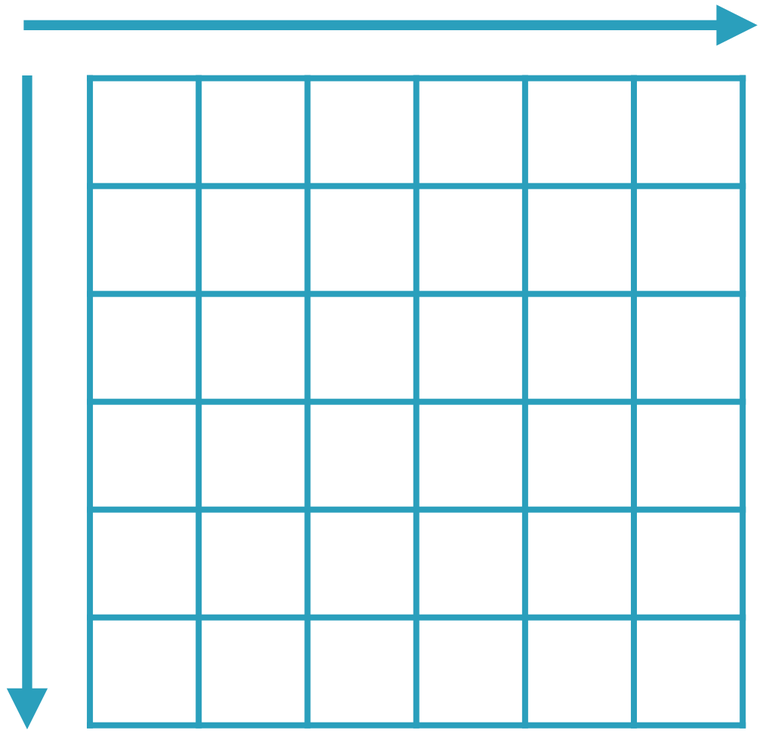


The number of channels specifies the number of elements in the 3rd dimension

Image as a Matrix



(6, 6, 1)



(6, 6, 3)

List of Images

A list of images can be represented as a 4D matrix

List of Images

The images should all be the same size

List of Images

(10, 6, 6, 3)

The number of images

List of Images

(10, 6, 6, 3)

The height and width of each image in the list

List of Images

(10, 6, 6, 3)

The number of channels

Demo

Image classification using scikit-learn

Summary

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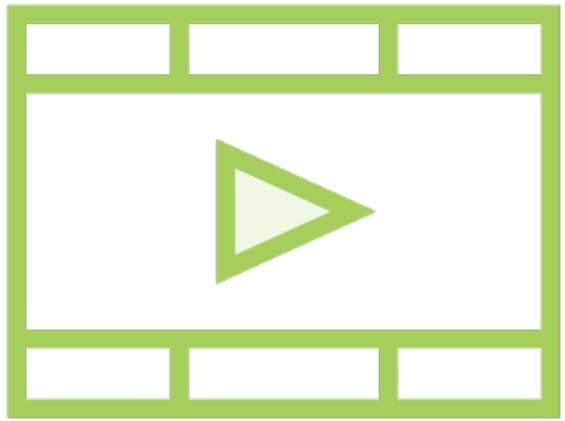
Related Courses



Building Clustering Models with scikit-learn

Building Regression Models with scikit-learn