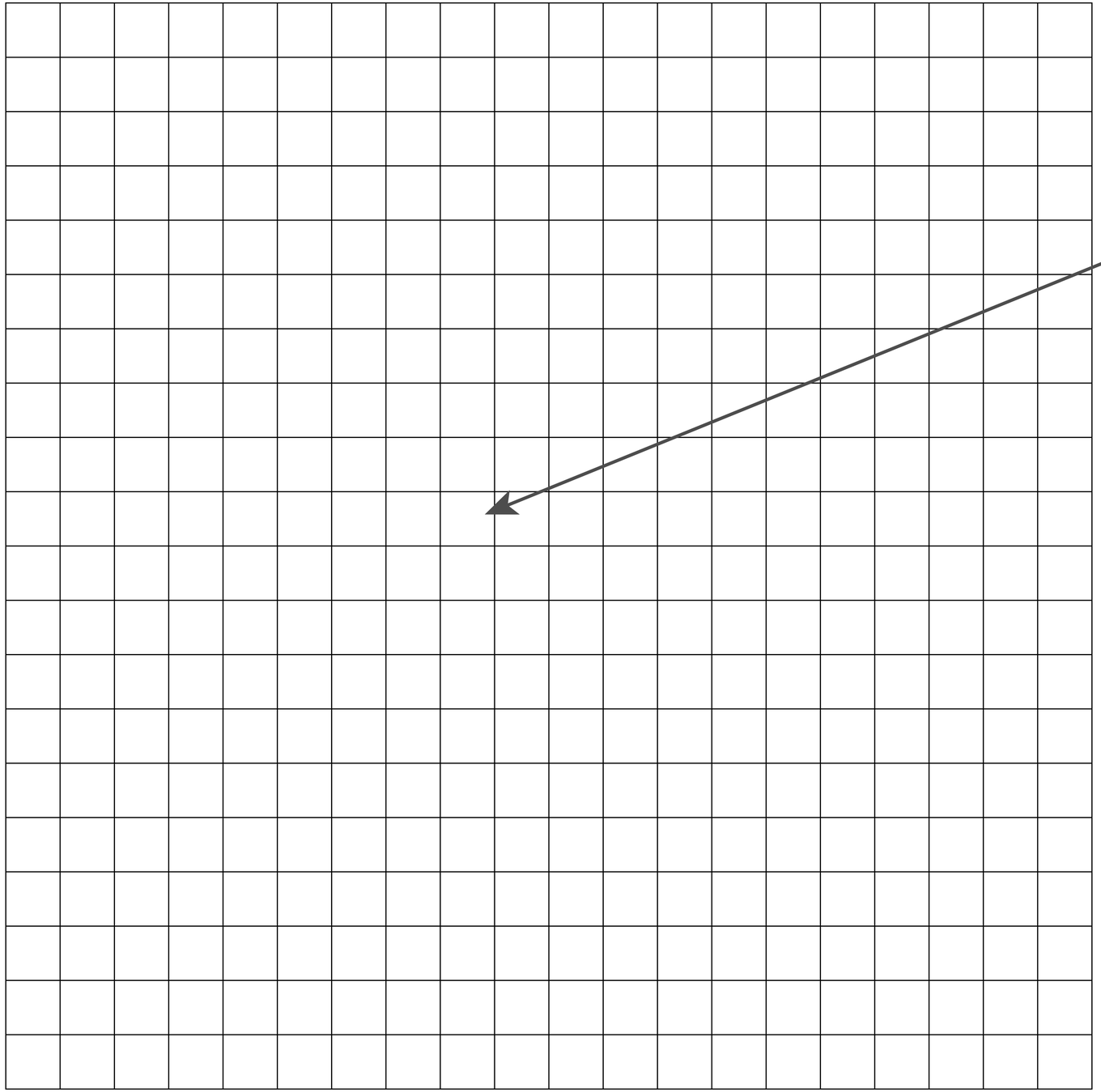
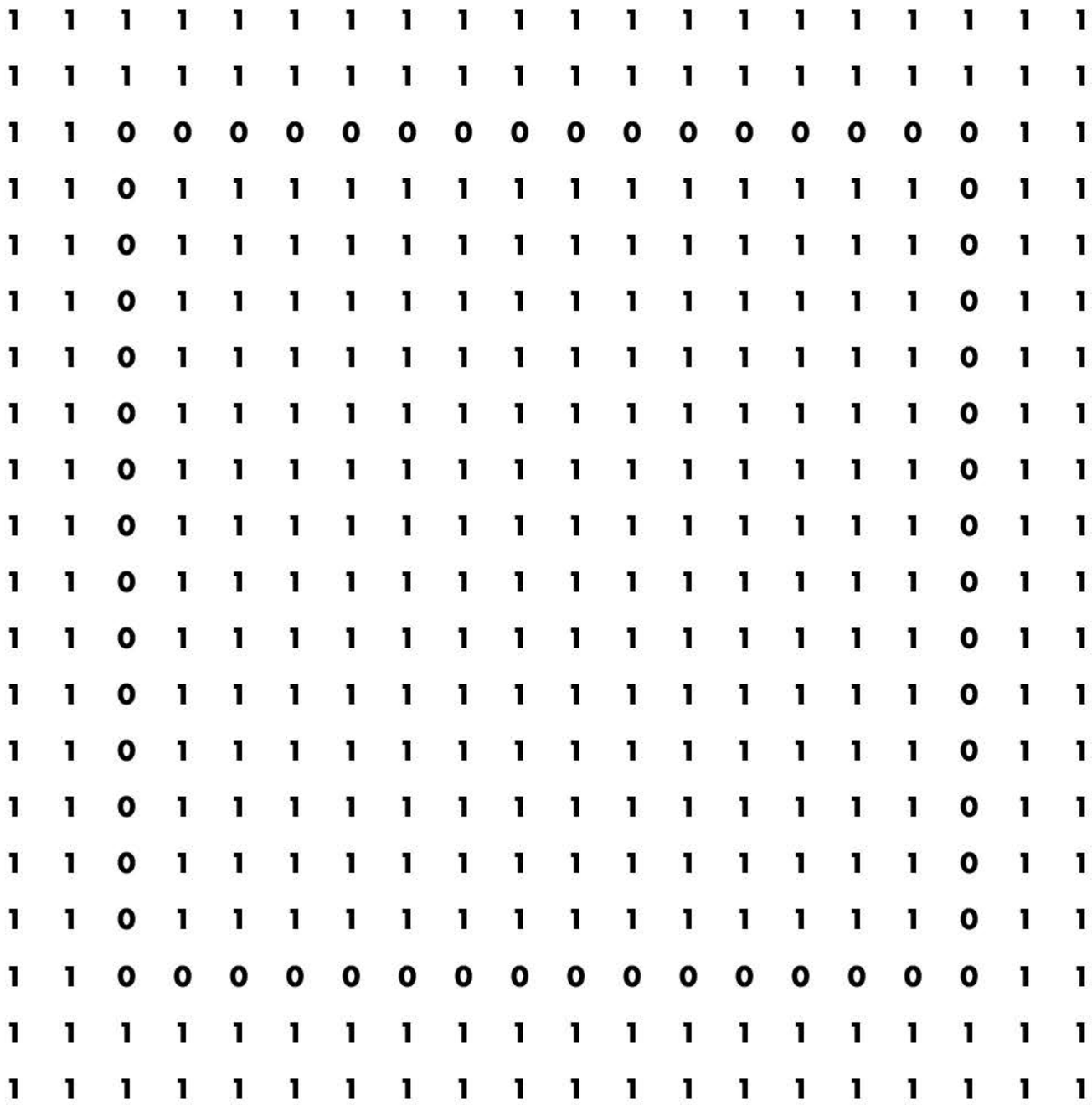
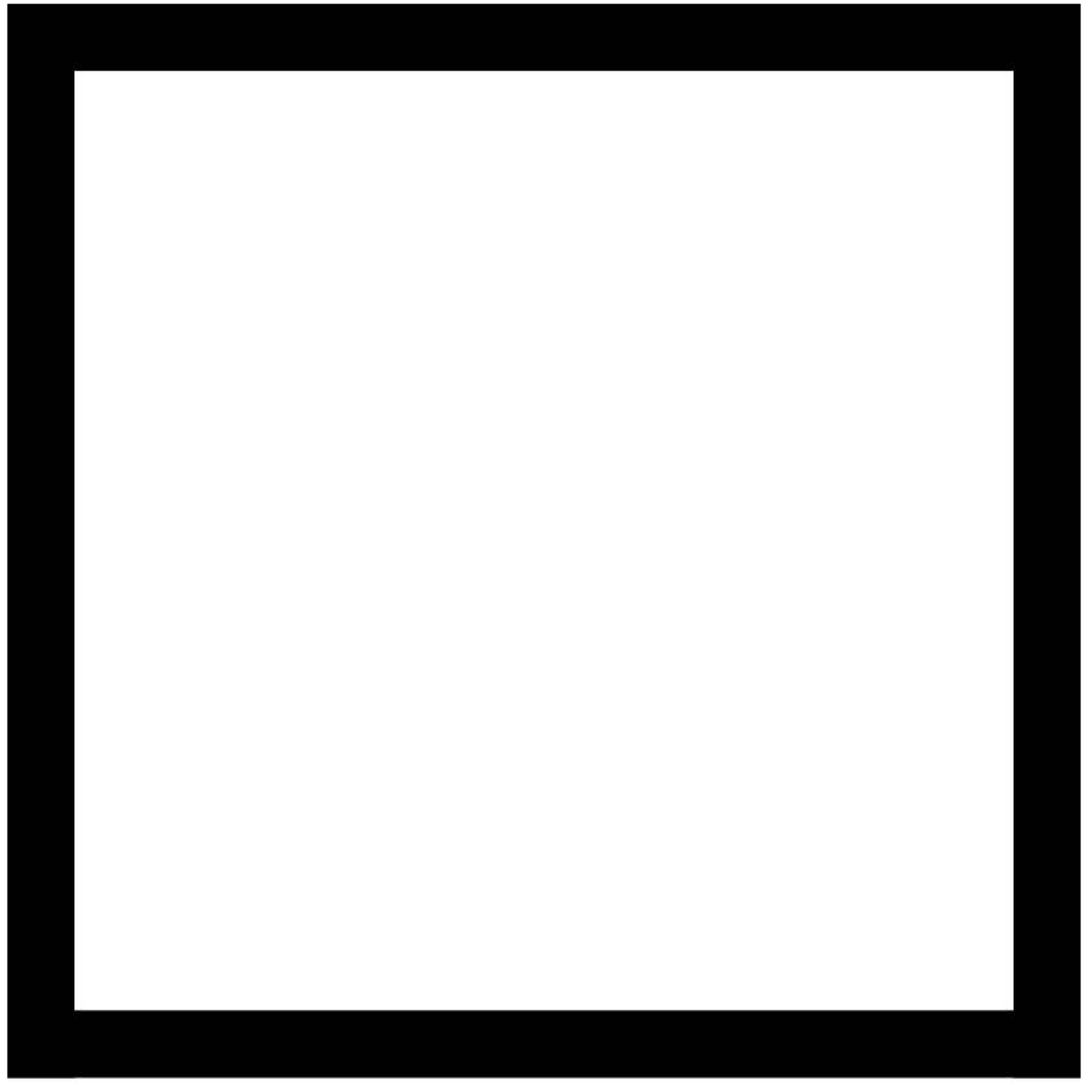


Pixel

Picture Element


1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1
1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1
1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1



The minimum number of possible values or states that a pixel can have is

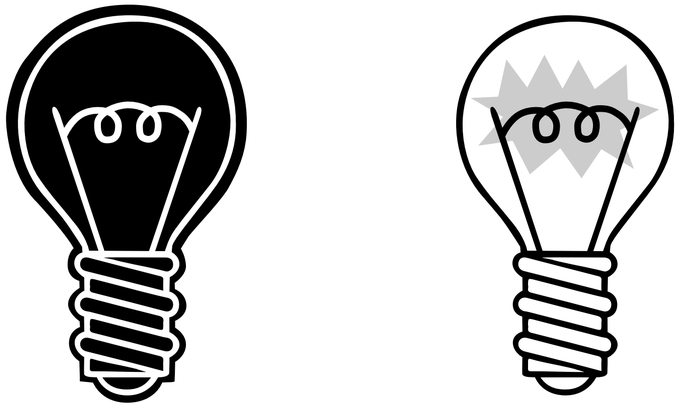
2

0 or 1
“off” or “on”

1-bit Image

$$2^1$$

2 values: black and/or white



2-bit Image

$$2^2$$

4 possible values
Shades of grey from black to white
2 x 2

00 01 10 11



4-bit Image

$$2^4$$

16 possible values
Shades of grey from black to white
2 x 2 x 2 x 2

0000 0001 0010 0011 0100 0101 0110 0111
1000 1001 1010 1011 1100 1101 1110 1111



8-bit Image

$$2^8$$

256 possible values
Shades of grey from black to white
2 x 2 x 2 x 2 x 2 x 2 x 2 x 2

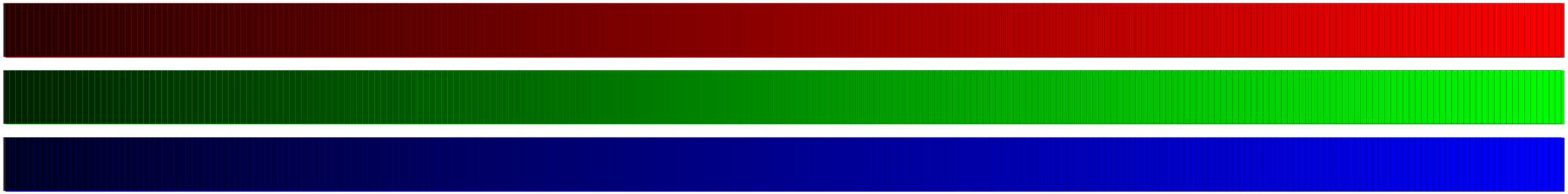


24-bit Image

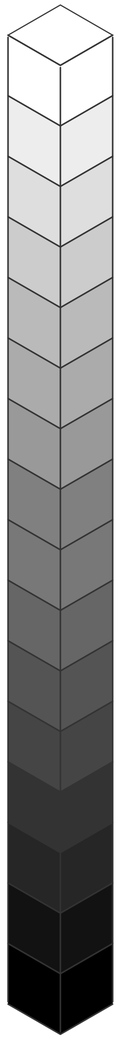
$$2^8 \times 3$$

One colour range for each of the three colour channels Red, Green, and Blue

16,777,216 possible colour values



Number of Bits Used	Number of Possible Colours
1	2
2	4
4	16
8	256
16	65,536
24	16,777,216



Greyscale
4-bit



Greyscale
8-bit

Name	Extension	Bit Depth	Channels
PSD	.psd	8 / channel	RGB + alpha
Photoshop Document		Proprietary format for editing in Adobe software	
PNG	.png	8 / channel	RGB + alpha
Portable Network Graphic		Lossless	
TIFF	.tif	8 / channel	RGB + alpha
Tag Image File Format		Lossless	
Targa	.tga	8 / channel	RGB + alpha
		Lossless	
JPG	.jpg	8 / channel	RGB
Joint Photographic Experts Group		Lossy	
GIF	.gif	Indexed, 1 - 8	Index
Graphic Interchange Format		Lossless, Lossy with a limited palette	