



**Why**

We want to represent images.

**Definitions**

A *binary image* is a two-dimensional array in  $\{0, 1\}$ . The first coordinate of the shape is the *height* and the coordinate term is the *width* of the image. A *grayscale image* is a two-dimensional array in  $\{0, \dots, n\}$ , in which  $n$  represents full saturation and all integers less than  $n$  represent increasing saturation.

An *RGB digital color* is a length three sequence of bit strings. The terms of the color are known as the channels. So, for example, the first term of the sequence is the *first channel*, the second term is the *second channel*, and the third term is the *third channel*.

An *RGB digital image* is a two-dimensional array in the set of RGB digital colors. The *image channels* are the two-dimensional array whose values are those of the corresponding channel in the original image. So, for example, the *first channel image* is the grayscale image whose values are the first channel of the original digital image.

We refer to any of these (binary images, grayscale images, RGB digital images) as *digital images*, or often, as *images*.



