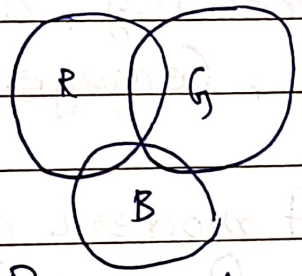
08/1/25

Motivation for DIP

→ Improvement of Pictorial Information
→ Efficient storage and transmission.

Texture: Same pattern appears in a sequence in the image to create a texture.



Primary colors

R + G = Yellow
R + B = Magenta
G + B = Cyan

Secondary colors

R + G + B = White

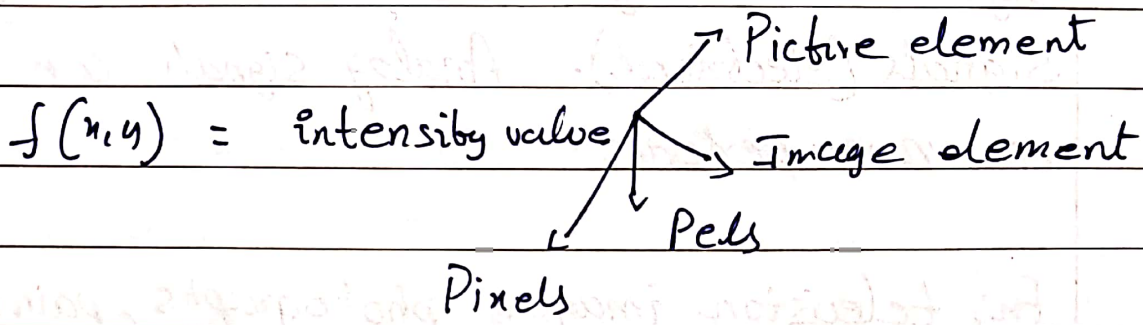
Y + M + C = Black or Pigment

Image:

→ An image is a two-dimensional function that represents a measure of some characteristic such as brightness or color of a viewed scene.

→ An image is a projection of a 3D scene into a 2D projection plane.

→ It can be defined as a two variable function $f(x,y)$ where for each position (x,y) in the projection plane, $f(x,y)$ defines the light intensity at this point.



If $f(x,y)$ is

0/1 : Binary Image

[0, 255] : Gray Scale and B/w Image

$-\langle [0,255], [0,255], [0,255] \rangle$: Color or Multi Spectral Image

- RGB : Red - Green - Blue
- HSV : Hue Saturation value
- HSL : Hue Saturation Lightness
- CMYK : Cyan - Magenta - Yellow - Black

→ An image is formed by two-dimensional analog and digital signal that contains color information arranged along x and y spatial axis.

Analog Image Processing

The analog image processing is applied on analog signals and it processes only two-dimensional signals. The images are manipulated by analog signals (electrical). Analog signals can be periodic or non-periodic.

Eg: television images, photographs, paintings

Digital Image Processing

-> Applied on digital images, for manipulating the images