Vision: Seeing an Image

- When the human vision sees things, it sees a picture, an image. But what does the computer see?

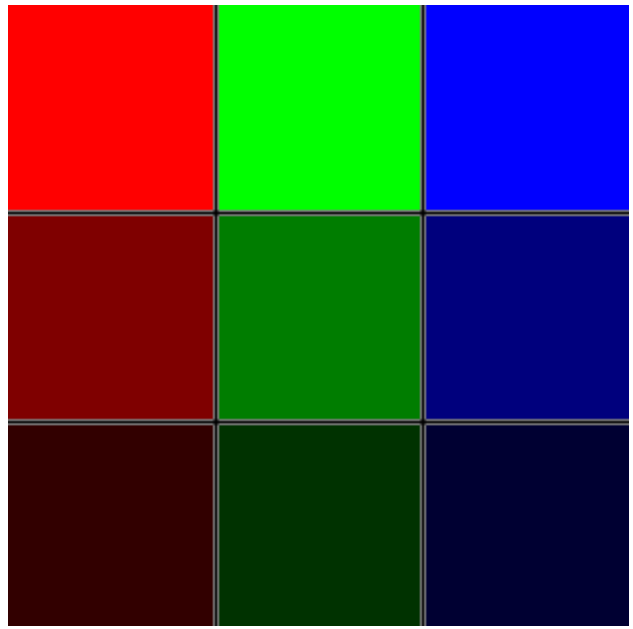
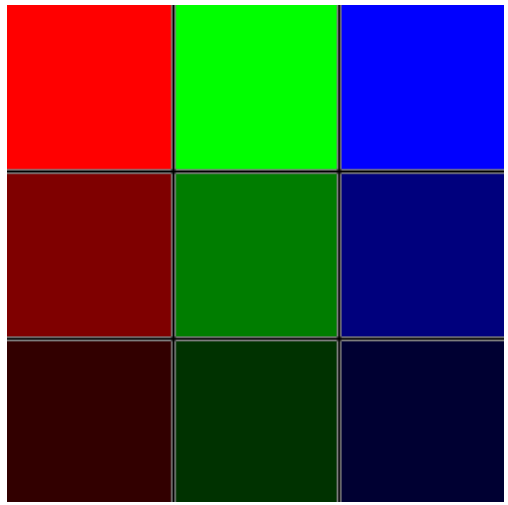


Figure: 3 pixel by 3 pixel grid

Image as a Matrix

- As it turns out, the computer sees an image as a matrix of pixels:
- $$\begin{pmatrix} P_1 & P_2 & P_3 \\ P_4 & P_5 & P_6 \\ P_7 & P_8 & P_9 \end{pmatrix}$$
- With $P_i = (\text{B}, \text{G}, \text{R})$
- While different compositions of B G R values make up unique colors (each color component ranges from 0 to 255).

Computer Vision

- So the following image has two forms.
- Its image form 
- And its matrix form

$$\begin{pmatrix} (0,0,255) & (0,255,0) & (255,0,0) \\ (0,0,125) & (0,125,0) & (125,0,0) \\ (0,0,50) & (0,50,0) & (50,0,0) \end{pmatrix}$$

Computer Vision: Videos

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- SCENE CHANGES!

Computer Vision: Scene Changes

- A scene change is a change in scene!
- 


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-  
- How does a computer see this scene change?

Computer Vision: Scene Changes

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- 

- How does a computer see this scene change?
- What in the sequence of matrices indicates this scene change?