Reducing Color

- How to convert a full color image into a paletted image
- “Posterize” picks color in the palette closest to full color pixel
- Dithering adds colors by combining palette colors of neighboring pixels

N. Damera-Venkata, B.L. Evans & V. Monga
Color Error Diffusion Halftoning,
IEEE Signal Processing 20(4), 51-58, July 2003.

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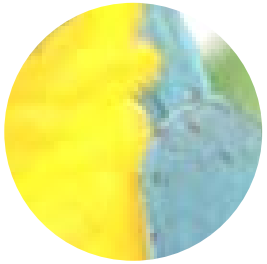

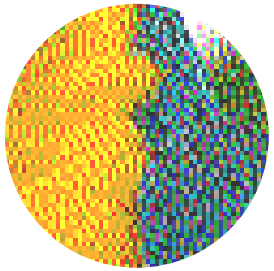

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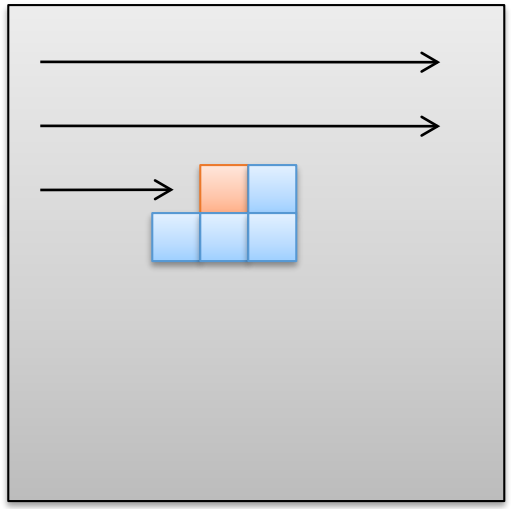
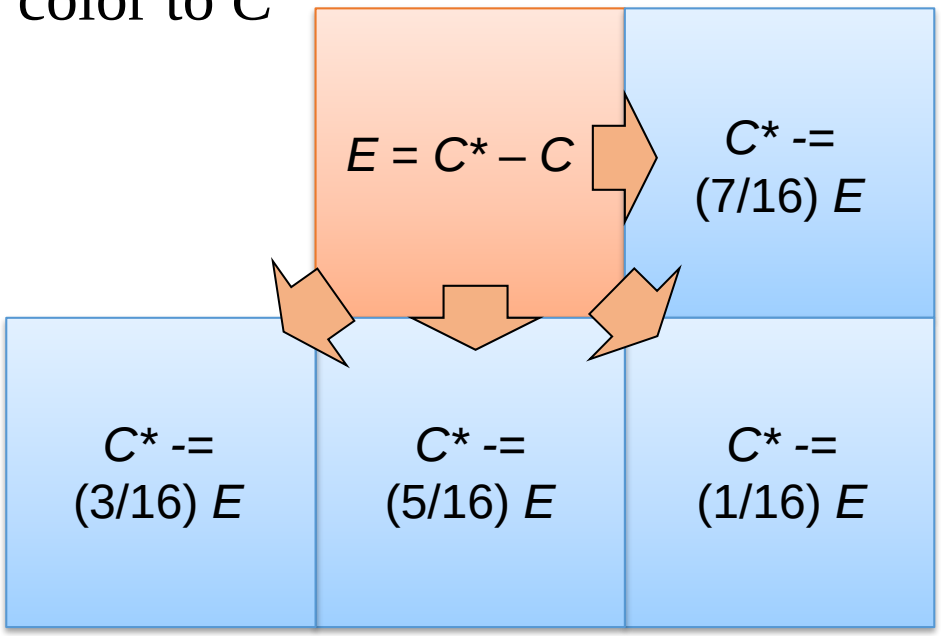
Error Diffusion



Floyd-Steinberg Algorithm

- Each pixel color $C(x,y)$ has an approximation $C^*(x,y)$
- Initialize $C^*(x,y) = \text{approx}(C(x,y))$ for all pixels
  - approx(C) returns closest palette color to C
- Approximation error: $E = C^* - C$
  - positive E: C^* too bright
  - negative E: C^* too dim
- Counteract error by changing brightness of unprocessed neighboring pixels



Dithered Images

Lego Mosaics