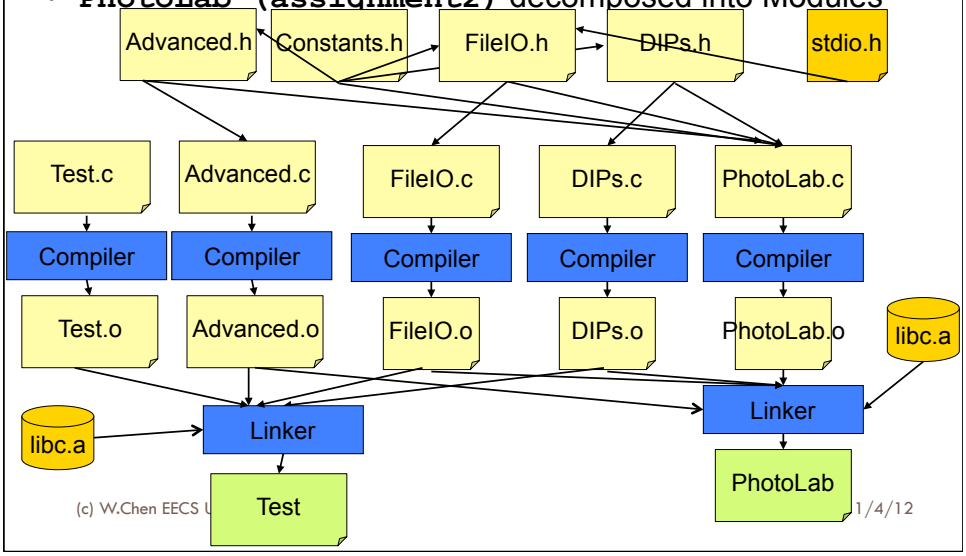
EECS22 LAB WEEK5

11/4/12

Weiwei Chen

PhotoLab Modules

- **`PhotoLab (assignment2)`** decomposed into Modules



Posterization

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- To posterize the image, we are going to change the least n, n ∈ {1,2,3,...8} significant bits of the color intensity values so as to change the tone of the pixels.
  - the nth least significant bit to be 0
  - the least n -1 bits to be all 1
  - Example: posterize the least 5 significant bits of 84
    - $(84)_{10} = (01010100)_2$

Posterization

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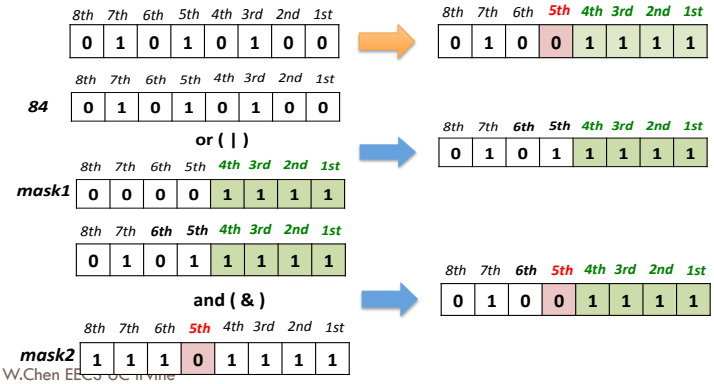
- Posterize the least 5 significant bits of 84
  - $(84)_{10} = (01010100)_2$
  - Set the 5th least significant bit to be 0
  - Set the least 4 significant bits to be 1



Posterization

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- How to design the masks for n-bit posterization?

DIP Operations

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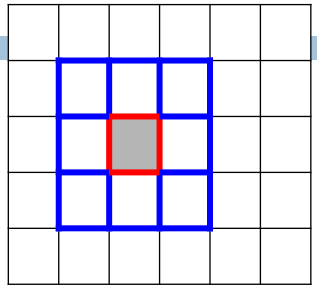
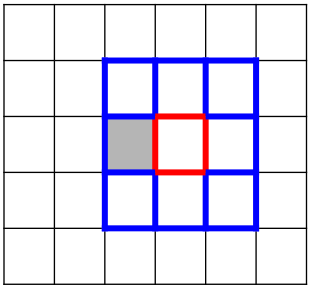
- Blur
  - A pixel has 8 neighbors
  - Get the average values of the three channels of the current pixel and its 8 neighbors'.
  - Set the pixel's color components to the average values respectively.
  - In order not to contaminate the original value of the picture, use temporary arrays for computation and copy the result back to the original arrays.





DIP Operations

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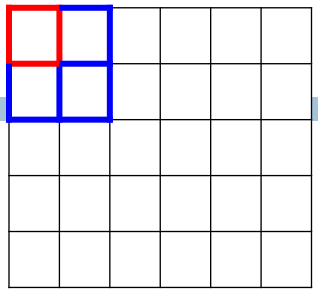
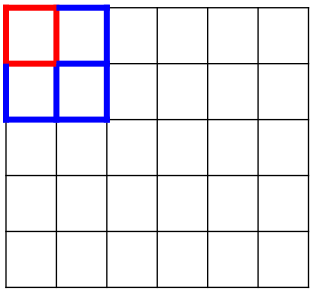
- Blur
  - Pixels on the corners and the edges.
  - Have fewer neighbors
  - Handle separately
  - Ignore pixels on the edges





Edge Detection

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- Color of two pixels C1=(R1, G1, B1), C2=(R2, G2, B2)
- Color Difference

$$D(C1,C2) = \sqrt{(R1-R2)^2+(B1-B2)^2+(G1-G2)^2}$$

- Compare pixel P and P_{right}, P and P_{bottom}
- If difference exceeds the threshold K, set P to be white (255, 255, 255); otherwise set P to be black(0, 0, 0)