

Take-home questions

1. Write down a 3x3 filter that returns a positive value if the average value of the 4-adjacent neighbors is less than the center and a negative value otherwise
2. Write down a filter that will compute the gradient in the x-direction:

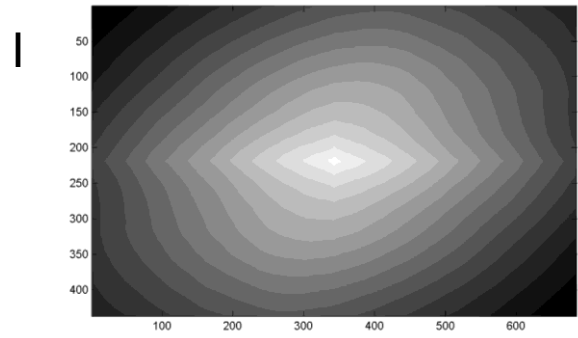
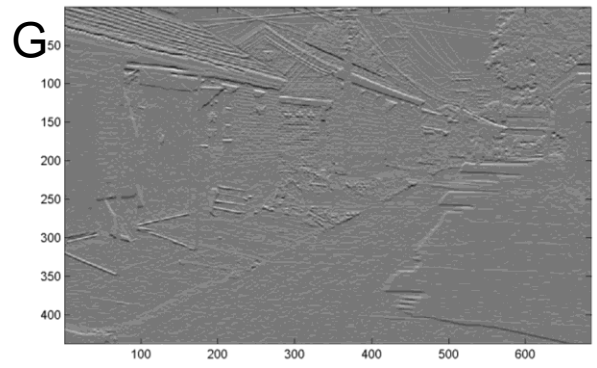
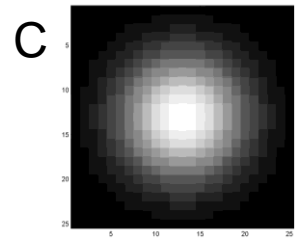
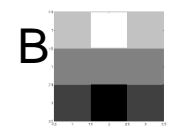
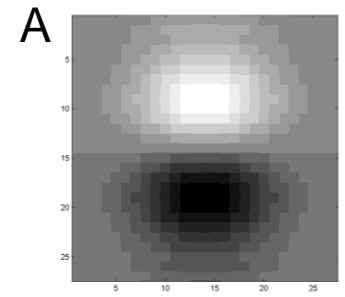
$$\text{grad}_x(y, x) = \text{im}(y, x+1) - \text{im}(y, x) \quad \text{for each } x, y$$

Take-home questions

3. Fill in the blanks:

- a) $_ = D * B$
- b) $A = _ * _$
- c) $F = D * _$
- d) $_ = D * D$

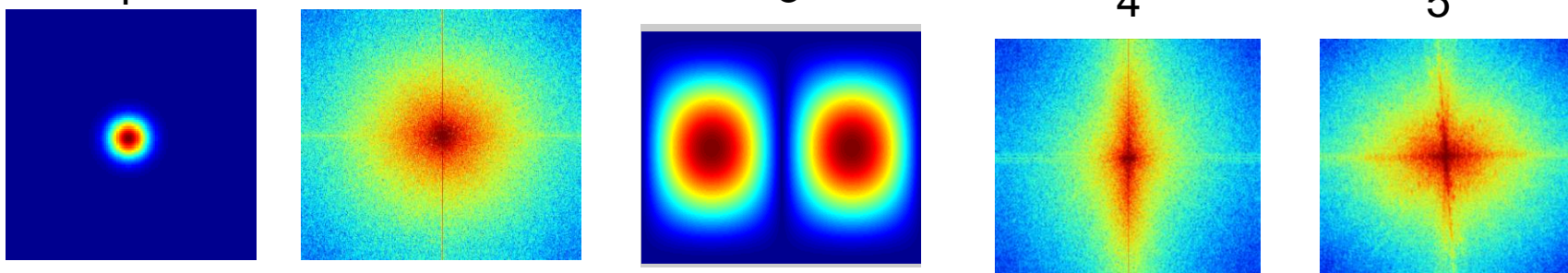
Filtering Operator



Take-home question



1. Match the spatial domain image to the Fourier magnitude image

1 2 3 4 5

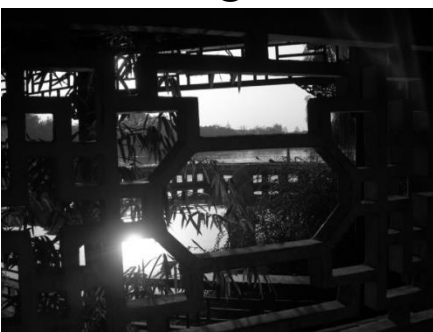


B

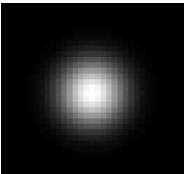
A


C



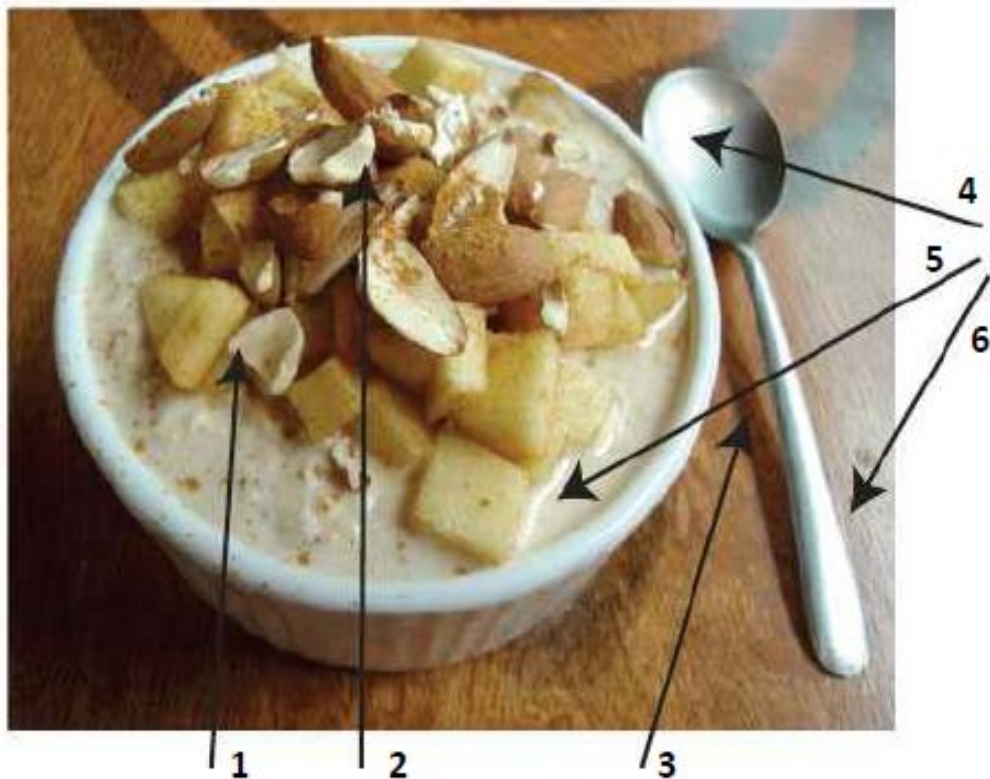
D



E



Take-home questions



- A. For each of the arrows in the above image, name the reasons the pixel near the end of the arrow has its brightness value and explain very briefly. The arrow pointing to milk is pointing to the thin bright line at the edge of the piece of apple; the arrow pointing to the spoon handle is pointing to the bright area on the handle.

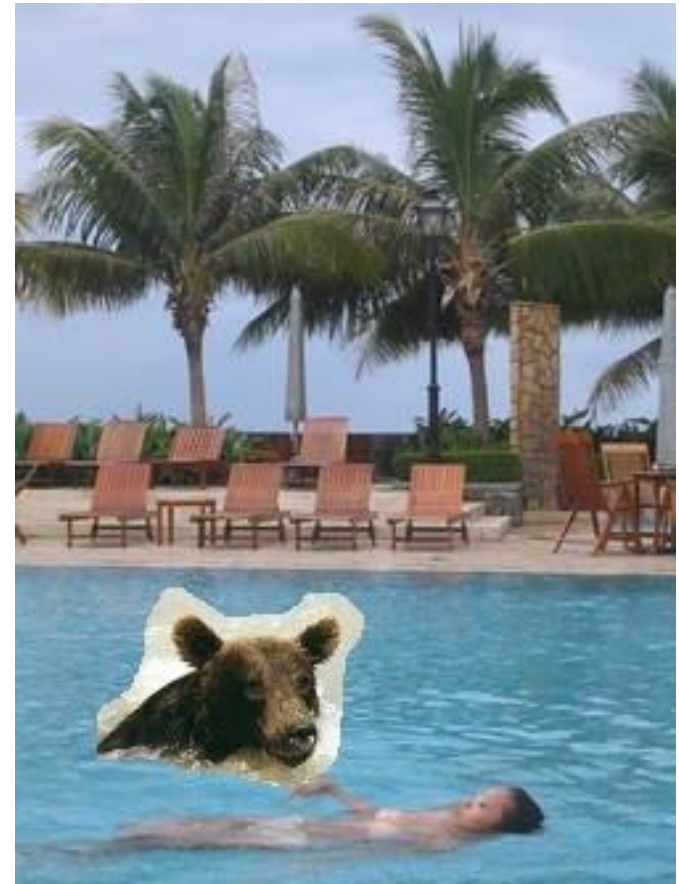
Possible factors: albedo, shadows, texture, specularities, curvature, lighting direction

Take-home questions

1. What would be the result in “Intelligent Scissors” if all of the edge costs were set to 1?
2. How could you change boundary costs for graph cuts to work better for objects with many thin parts?

Take-home questions

- 1) I am trying to blend this bear into this pool.
What problems will I have if I use:
 - a) Alpha compositing with feathering
 - b) Laplacian pyramid blending
 - c) Poisson editing?

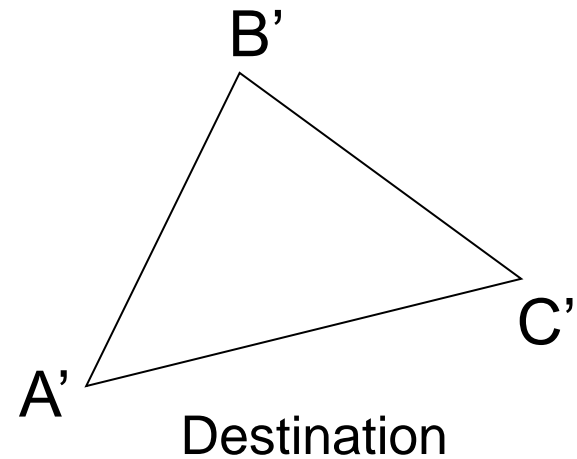
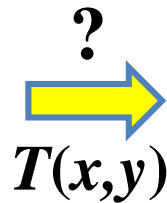
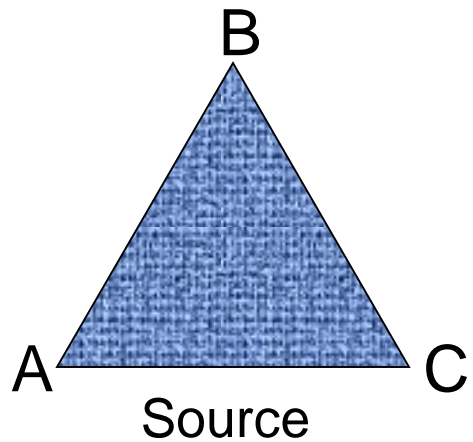


Take-home questions

- 2) How would you make a sharpening filter using gradient domain processing? What are the constraints on the gradients and the intensities?

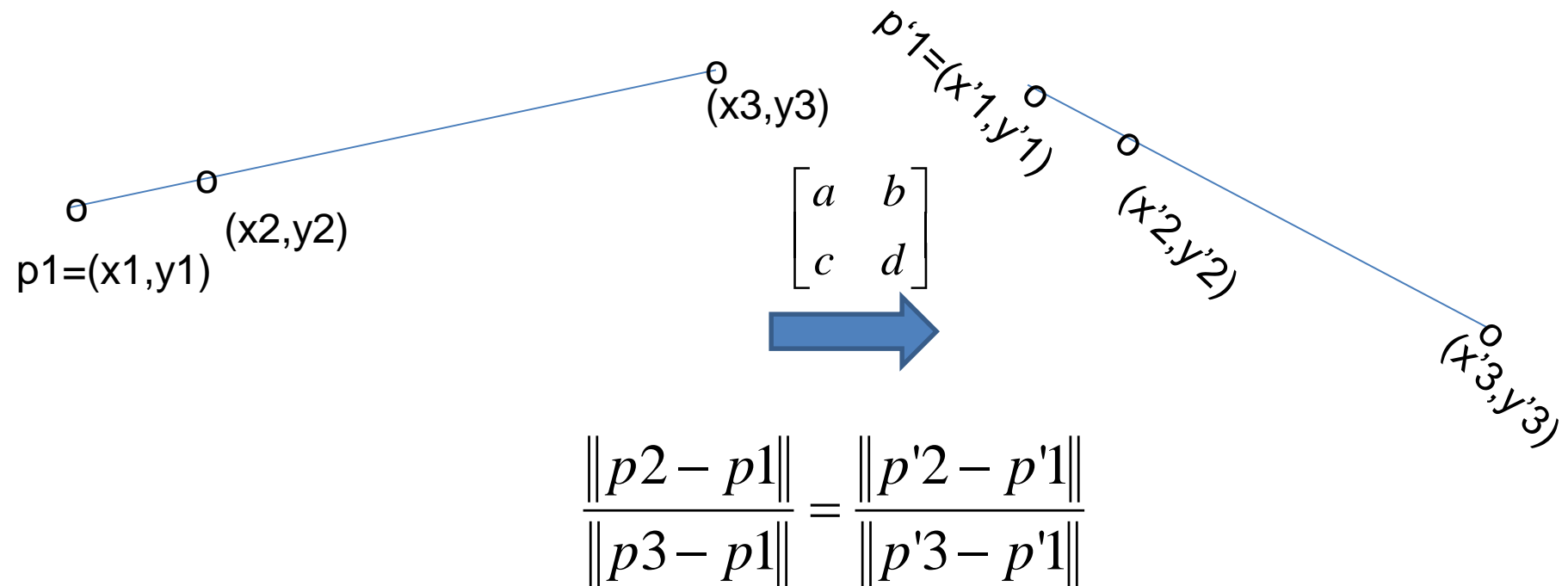
Take-home Question

1) Suppose we have two triangles: ABC and $A'B'C'$. What transformation will map A to A' , B to B' , and C to C' ? How can we get the parameters?



Take-home Question

2) Show that distance ratios along a line are preserved under 2d linear transformations.



Hint: Write down x_2 in terms of x_1 and x_3 , given that the three points are co-linear