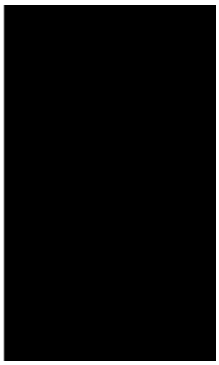
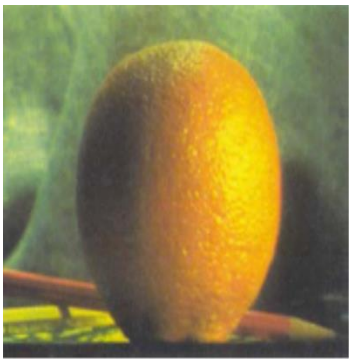
Homework 1

Laplacian Blending

Deadline: 5/29 11:59 pm **10 points**

In the first homework, you will work on Laplacian Blending. You have an image of an orange, apple and a mask.

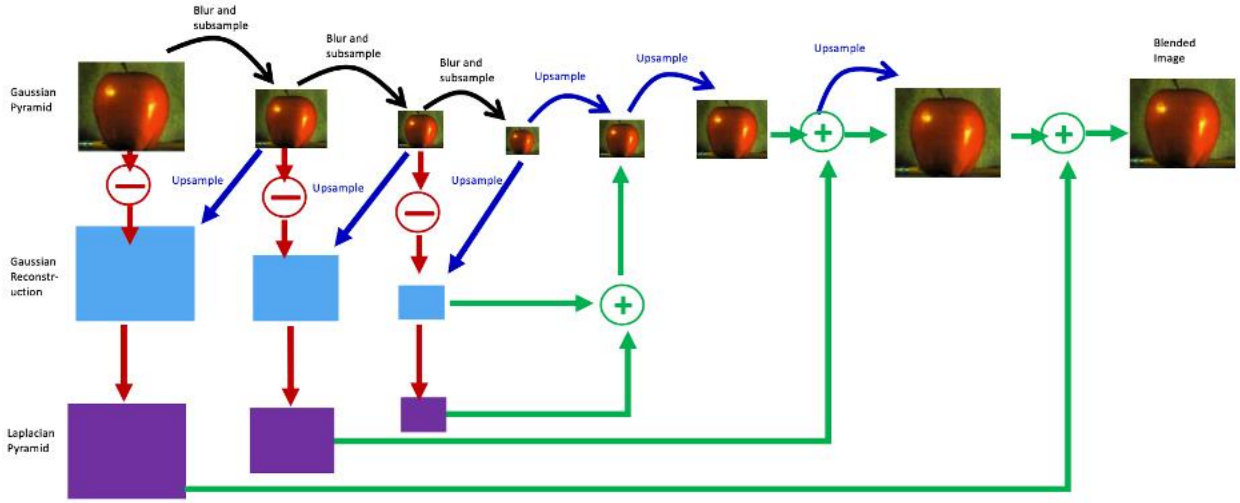
Combinig them just using the original image will be terrible.

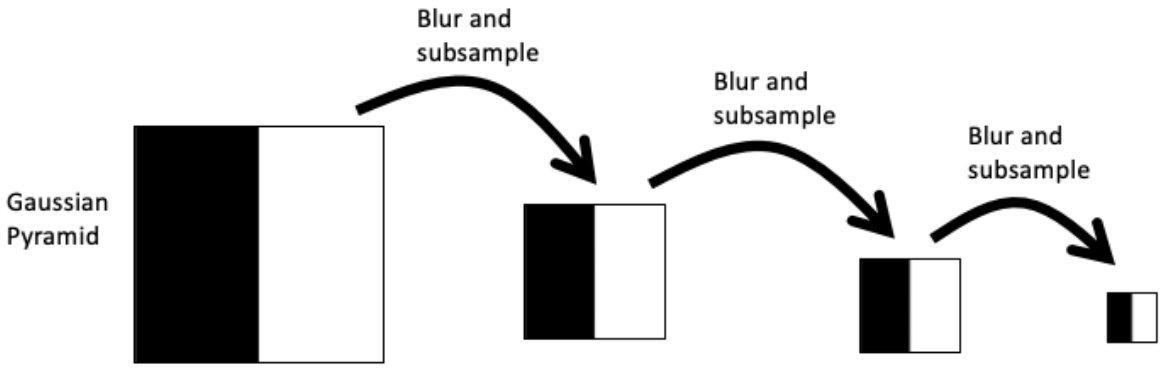
Unblended image

Using Laplacian Pyramid will have a much better output

Apple image | Orange Image | Blended apple and orange. What a fruit!

For both of the images, we must build a Laplacian pyramid and we have to build a Gaussian pyramid of the mask.





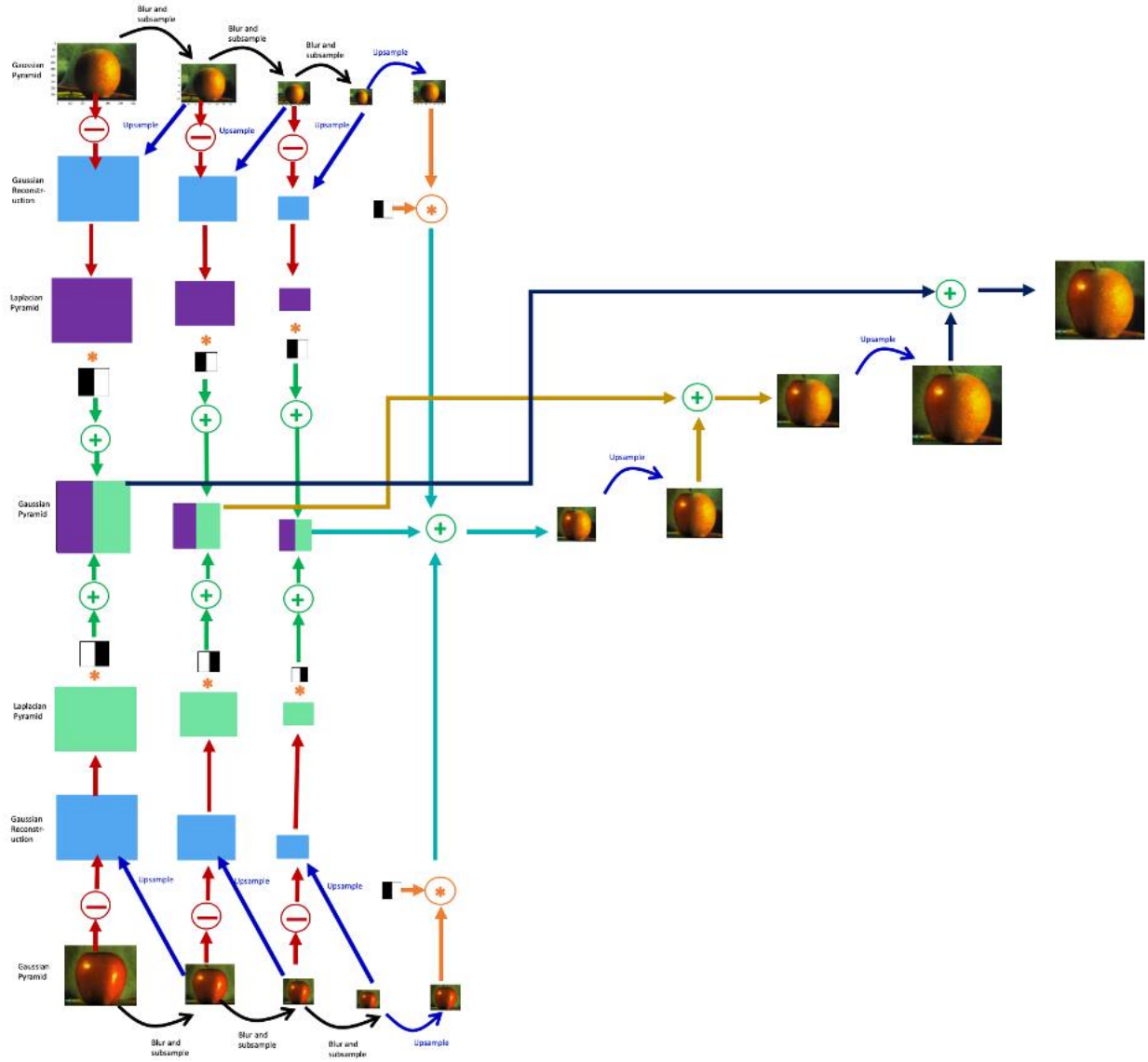
The Gaussian pyramid makes the masks smooth.

Use the below formula to combine the Laplacian pyramid in each scale.

$$Combined\ Laplacian_k = Mask_k * LaplacianA_k + (1 - Mask_k) * LaplacianB_k$$

Here is the complete algorithm:

1. Build Laplacian pyramids LA and LB from images A and B
2. Build a Gaussian pyramid GR from selected region R *(mask that says which pixels come from left and which from right)*
3. Form a combined pyramid LS from LA and LB using nodes of GR as weights:
   - *LS(i,j) = GR(I,j,)*LA(I,j) + (1-GR(I,j))*LB(I,j)*
4. Collapse the LS pyramid to get the final blended image



Reference: mzaho98

What to send:

1) Your code
2) A report that consists of the output of your code and your code with comments and give description any time your think is necessary to make it clear.

- You should use python programming language.
- You should implement the Laplacian yourself and cannot use a built-in method for that.