Hacettepe University

Computer Engineering Department

BBM415 – Fundamentals of Image Processing Lab.

Assignment 3 Report

Using Image Pyramid for Image Blending

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In this problem, we need to blend two images (or one image with different locations) using image pyramids. We use mask and blend second image part which corresponds to mask's brighter part.

First of all, I created gaussian pyramid for both images. Then using this gaussian pyramid, I created laplacian pyramid to blend two images.

I also created the gaussian pyramid for mask, which will be used in blending two laplacian pyramids.

After that, I blended each level of laplacian pyramids using region mask from the same level. I used the formula given to us.

Blended Laplacian = Partially Used Image * Gaussian of Mask + Image Applied On * (1 – Gaussian of Mask)

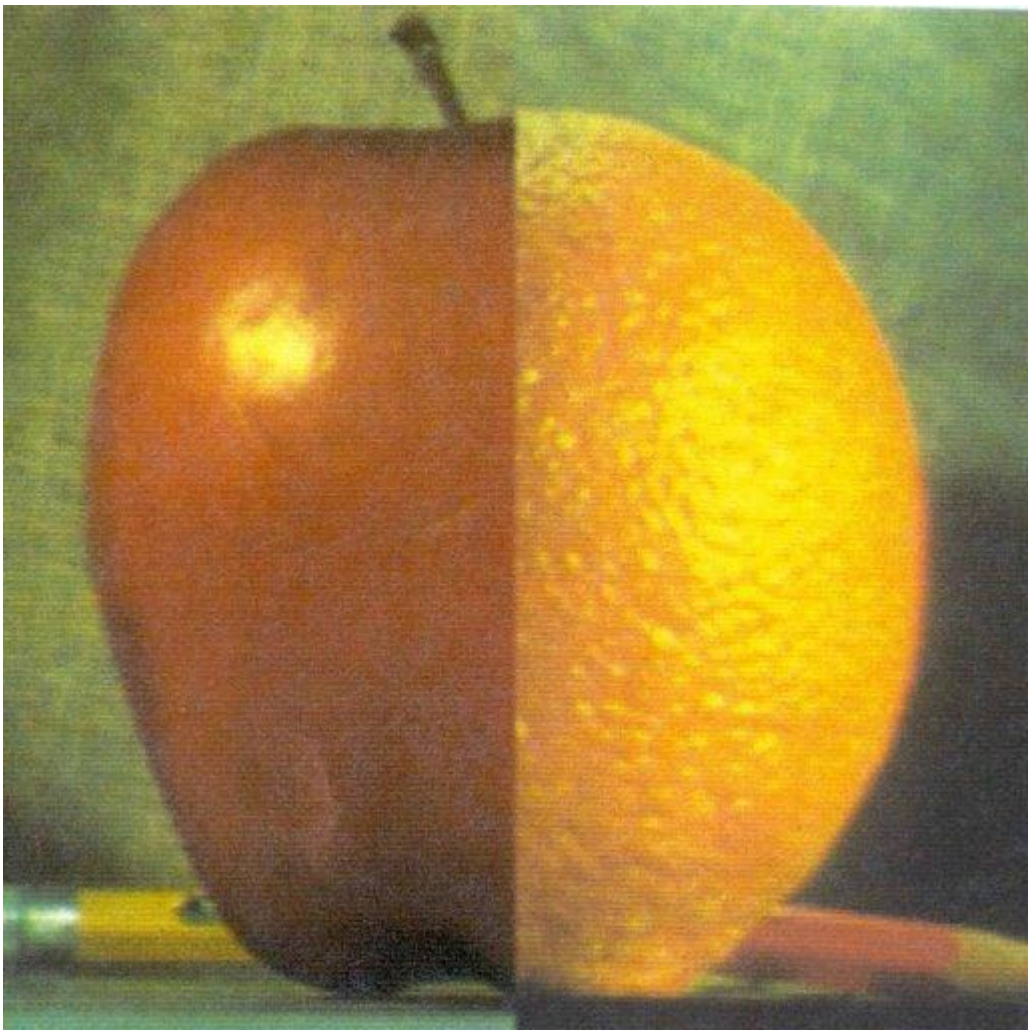
Finally, I reconstructed image with blended laplacian. I add upsampled laplacian to next level's laplacian (sizes are equal). This goes on every level of blended laplacian. In the end, I get fully blended image.

As I've been using Google Colab, GUI functions like selectROI didn't work for me. I had to make my own masks with code or by hand. I add each mask as image and their codes (except that I drew it by hand).

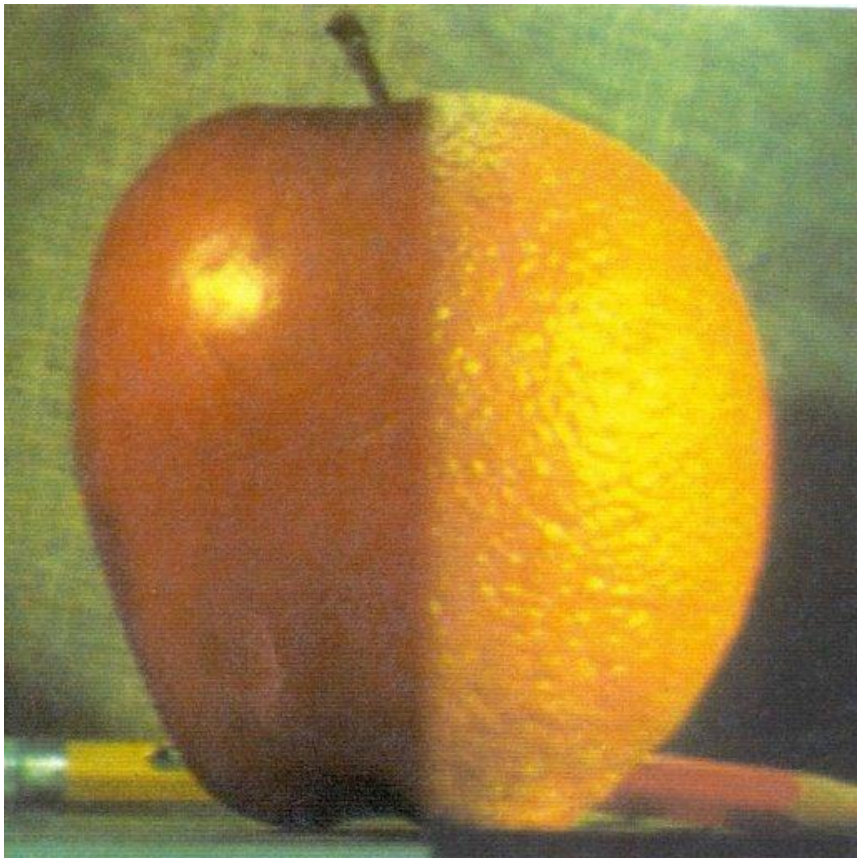
Also, I had to do my mask's brighter part as (1, 1, 1) (RGB). When I tried (255, 255, 255), my output was unnecessarily bright and luminous.

We can clearly see that, when number of pyramid levels goes higher, the transition between blended part and normal image is getting smoother.

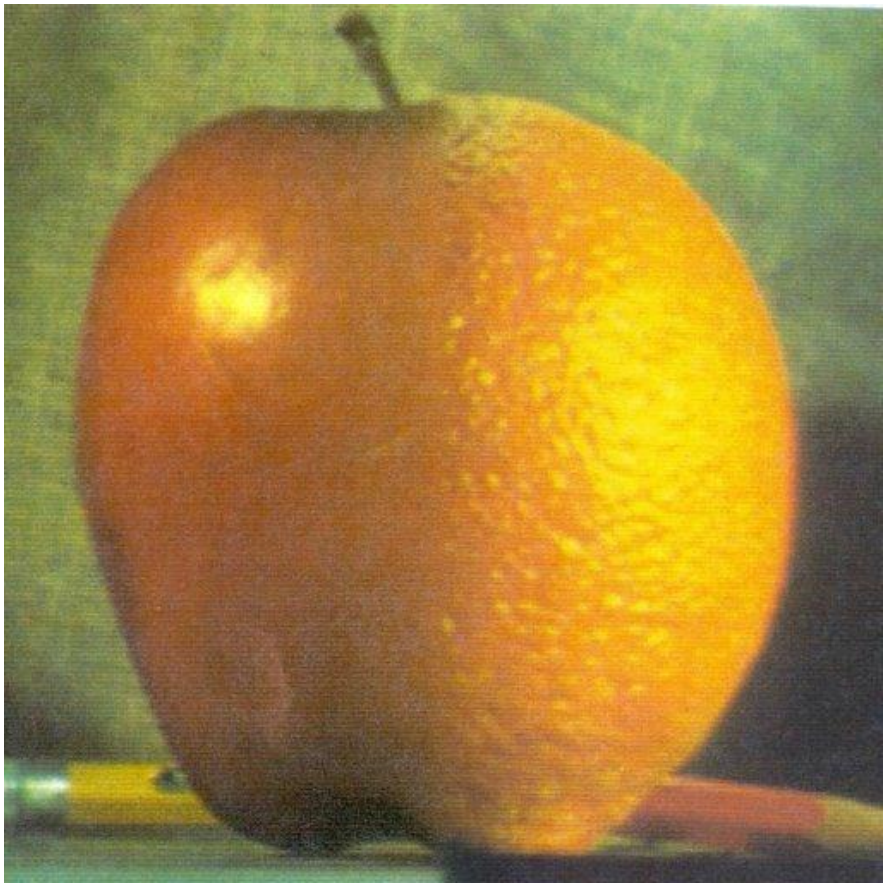
Number of pyramid levels 1:



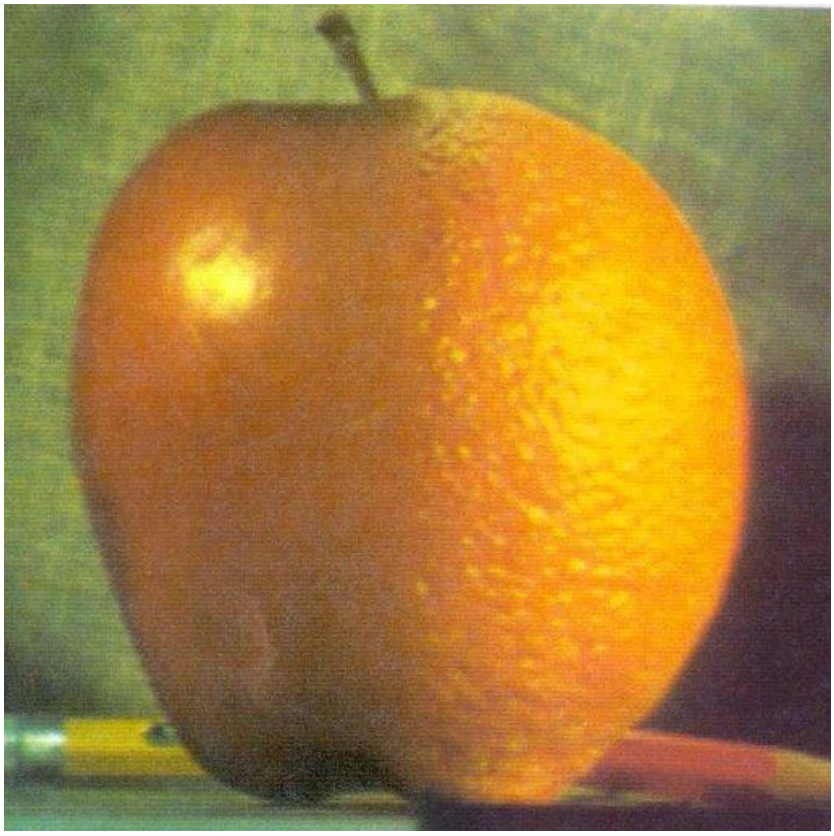
Number of pyramid levels 3:



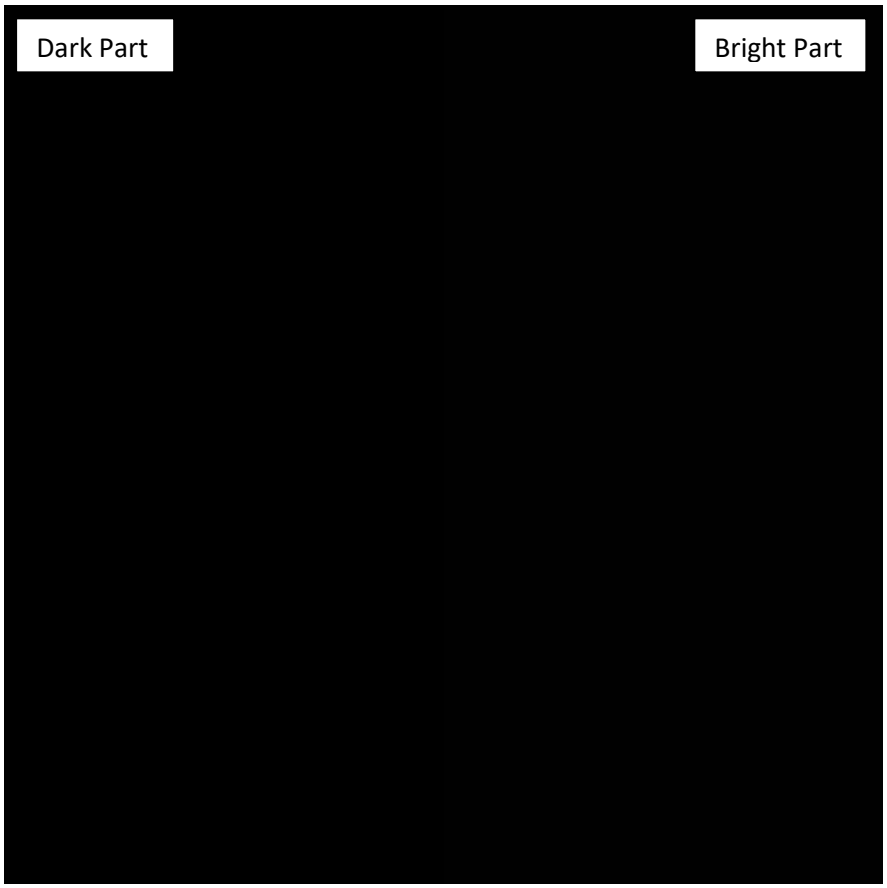
Number of pyramid levels 7:



Number of pyramid levels 15:



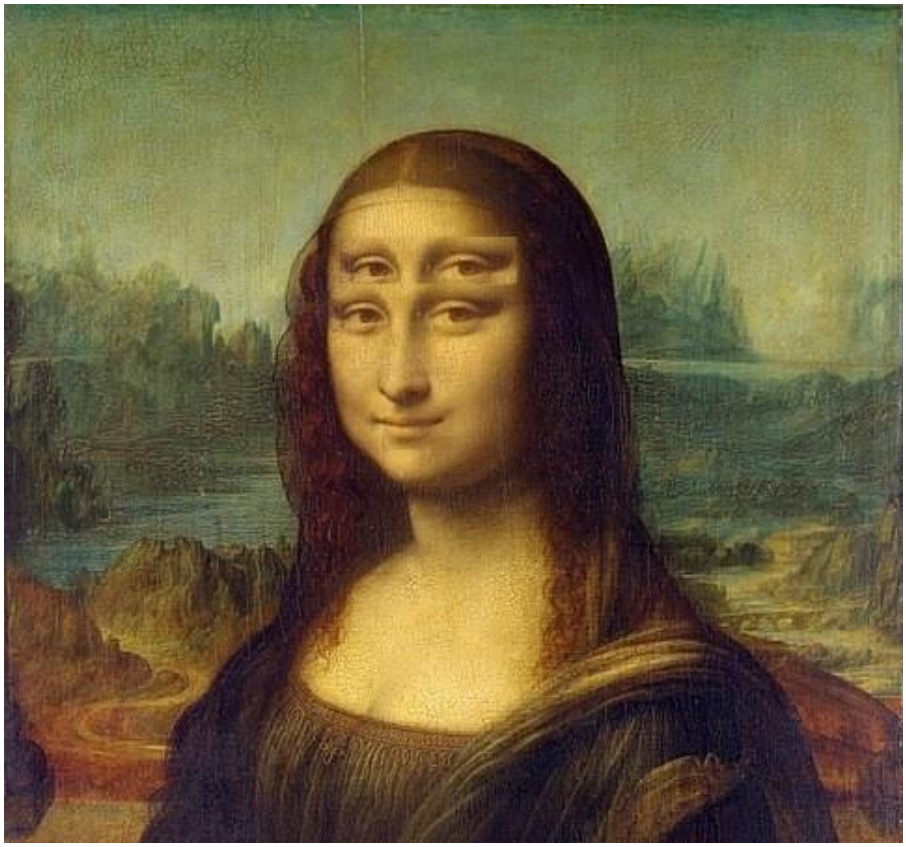
Mask of image:



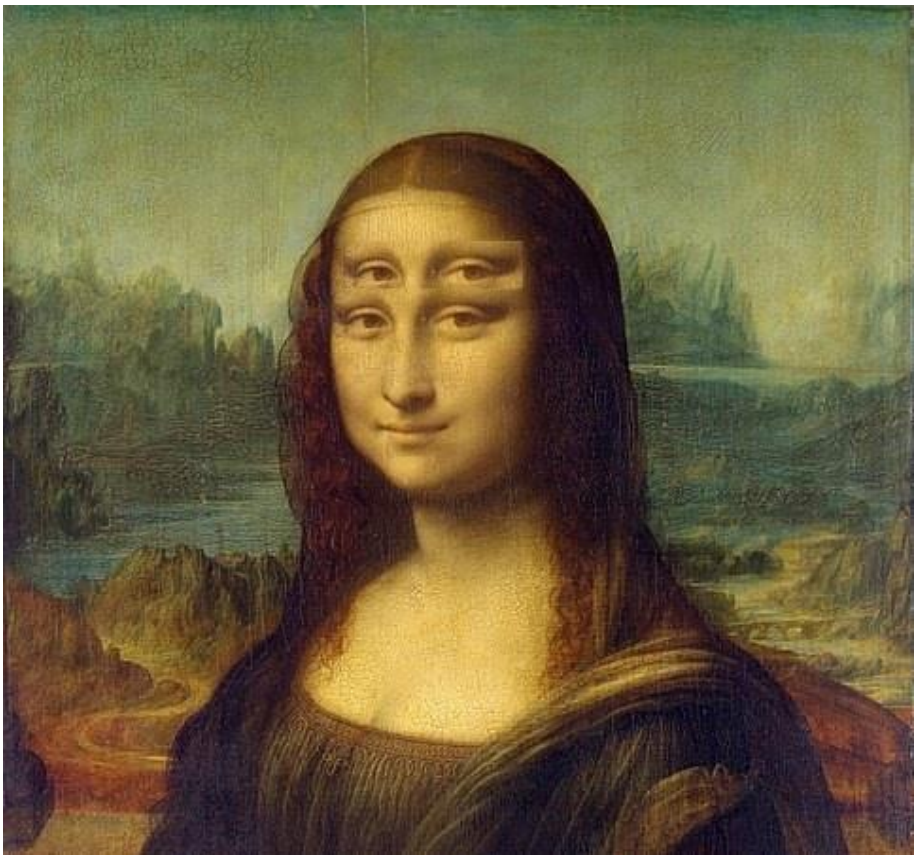
Dark Part

Bright Part

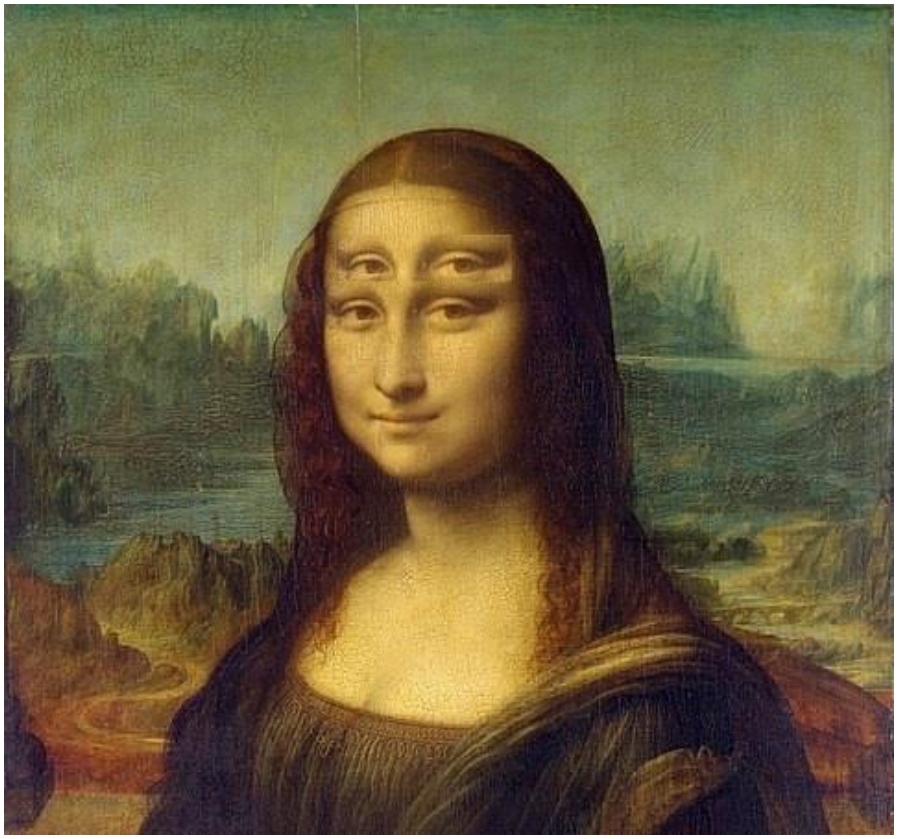
Number of pyramid levels 1:



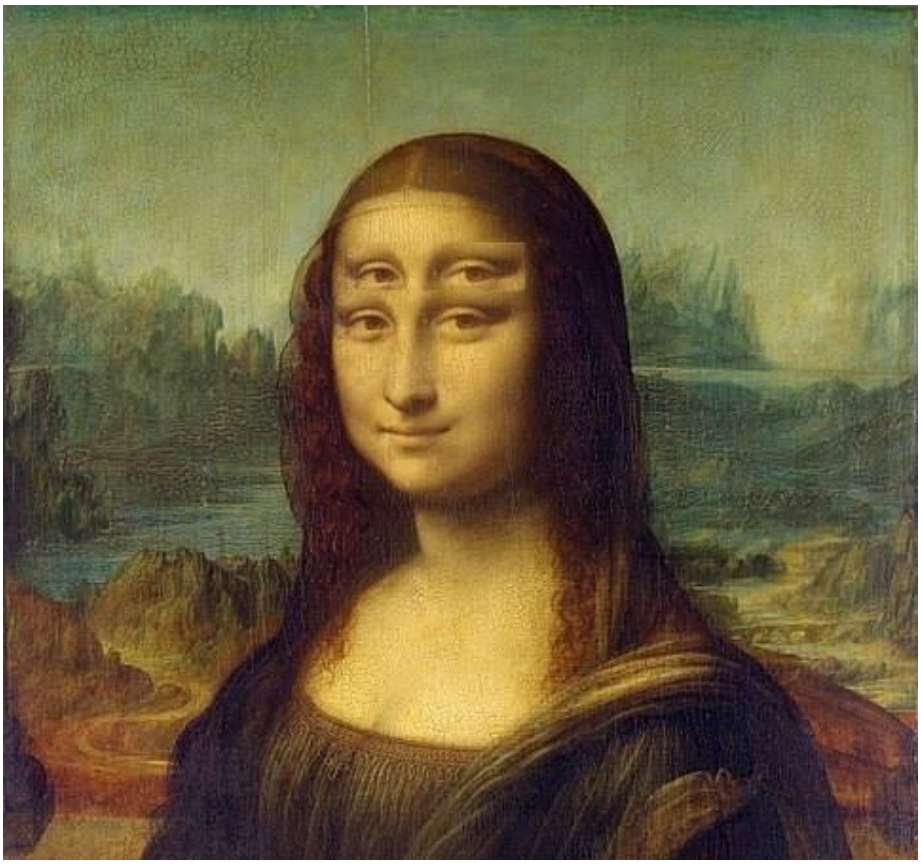
Number of pyramid levels 3:

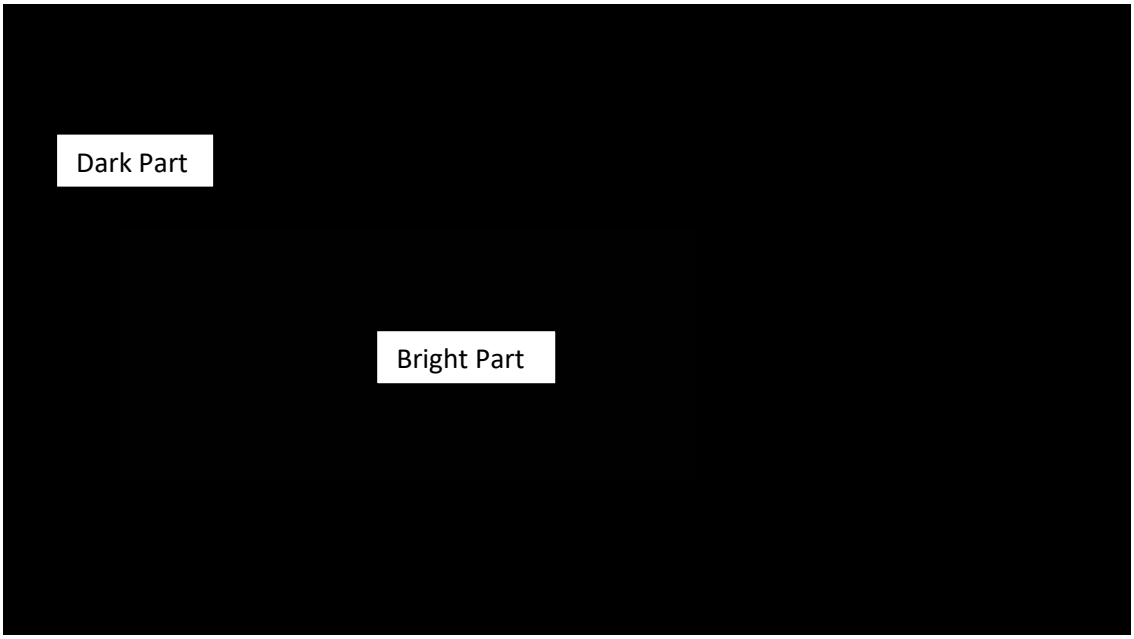


Number of pyramid levels 7:



Number of pyramid levels 15:



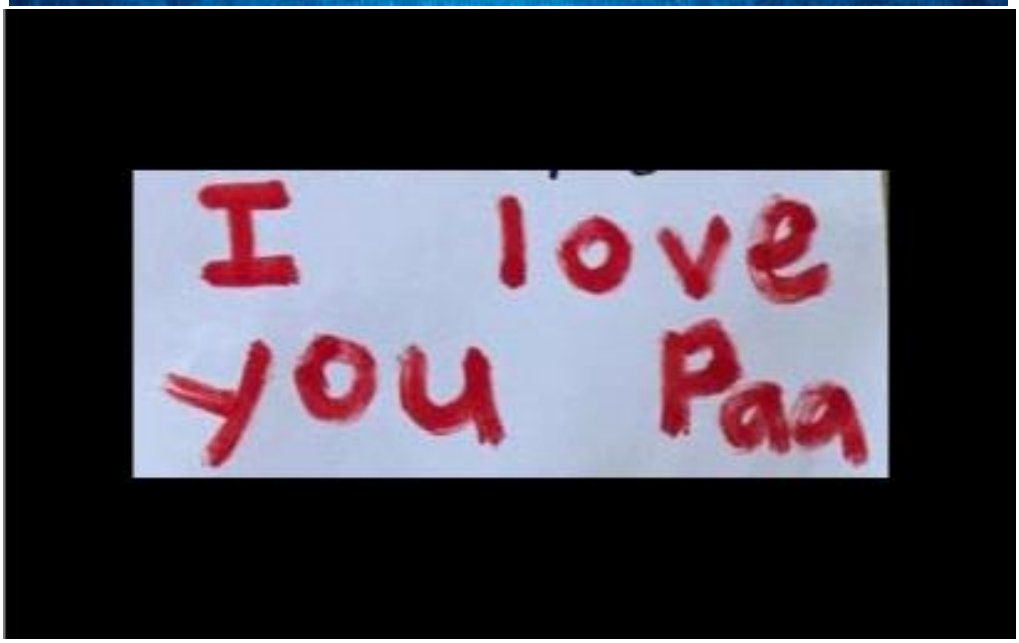

Dark Part
Bright Part

Number of pyramid levels 1:

Number of pyramid levels 3:

Number of pyramid levels 7:

Number of pyramid levels 15: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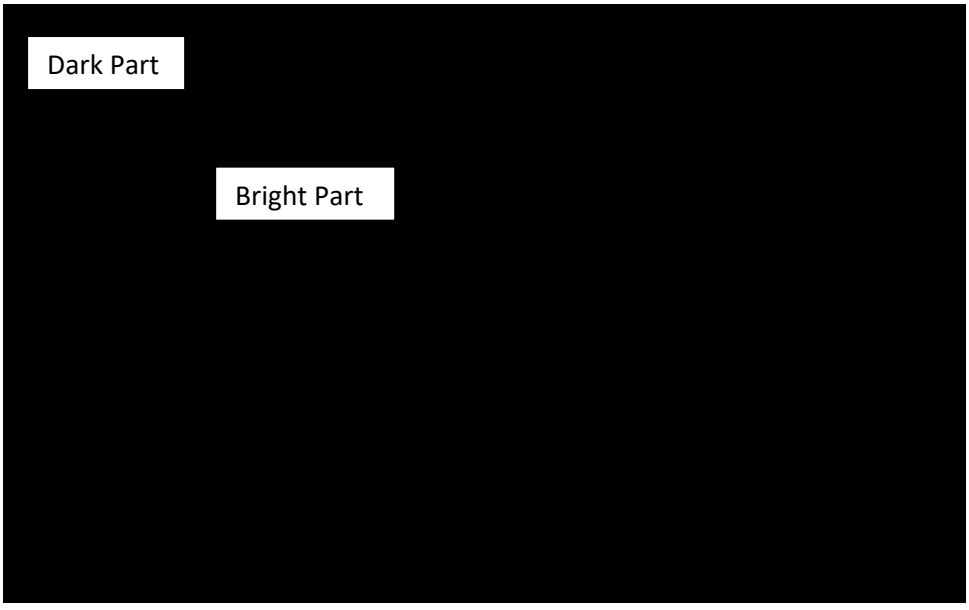
Dark Part
Bright Part

Number of pyramid levels 1:

Number of pyramid levels 3:

Number of pyramid levels 7:

Number of pyramid levels 15:

Dark Part

Bright Part

Number of pyramid levels 1:

Number of pyramid levels 7:

Number of pyramid levels 15:

Number of pyramids 50: