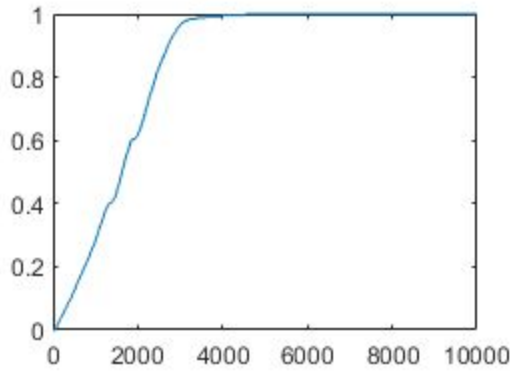
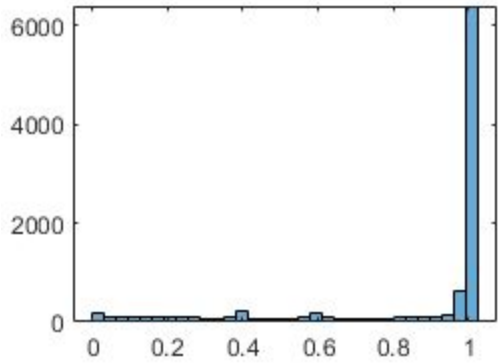
Homework1 Report

Part 0 Getting Started

a. Sort all the intensities in A, put the result in a single 10000-dimensional vector x, and plot the values in x.



b. Display a figure showing a histogram of A's intensities with 32 bins



c. Create and display a new binary image with the same size as A, which is white wherever the intensity in A is greater than a threshold t, and black everywhere else.

d. Generate a new image (matrix), which has the same size as A, but with A's mean intensity value subtracted from each pixel. Set any negative values to 0

e. Let y be the vector: y = [1: 8]. Use the reshape command to form a new matrix s whose first column is [1, 2, 3, 4]', and whose second column is [5, 6, 7, 8]'.

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y = [1:8];
s = reshape(y, [4, 2]);
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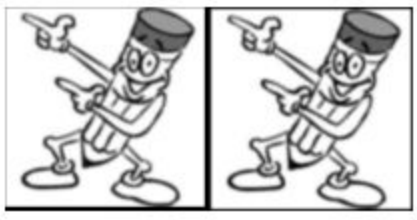
f. Create a vector [1, 3, 5 …, 99]. Extract the corresponding pixel from the image in its two dimensions, i.e., subsample the original image to its half size.

g. Use fspecial to create a Gaussian Filter and then apply the imfilter function to the image with the created Gaussian Filter, by doing so you should see a blurred image. Change three combinations of parameters of the Gaussian Filter and compare the results.

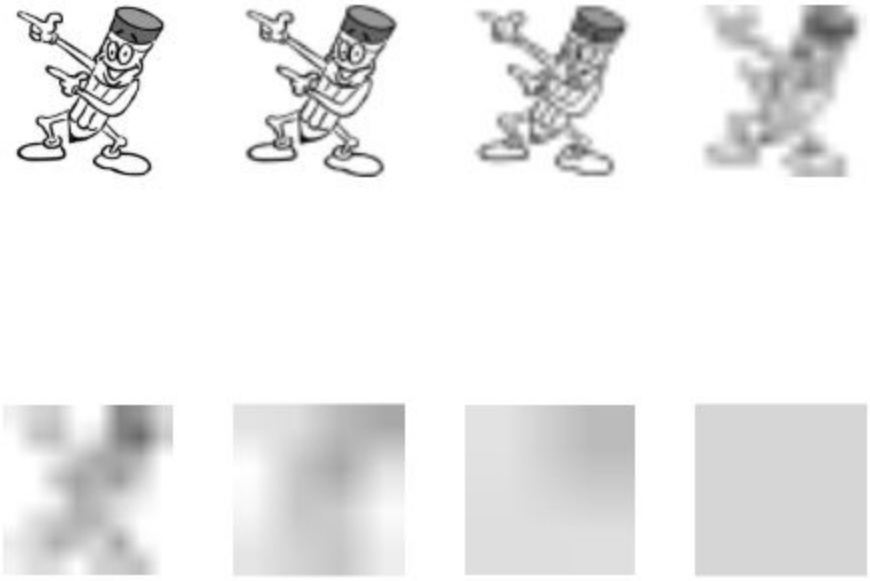
h. Apply the conv2 instead of imfilter function to the same process (for one Gaussian Filter), do you see any changes? Why?
The left side is the image which is processed by imfilter, the right side is the image which is processed by conv2.



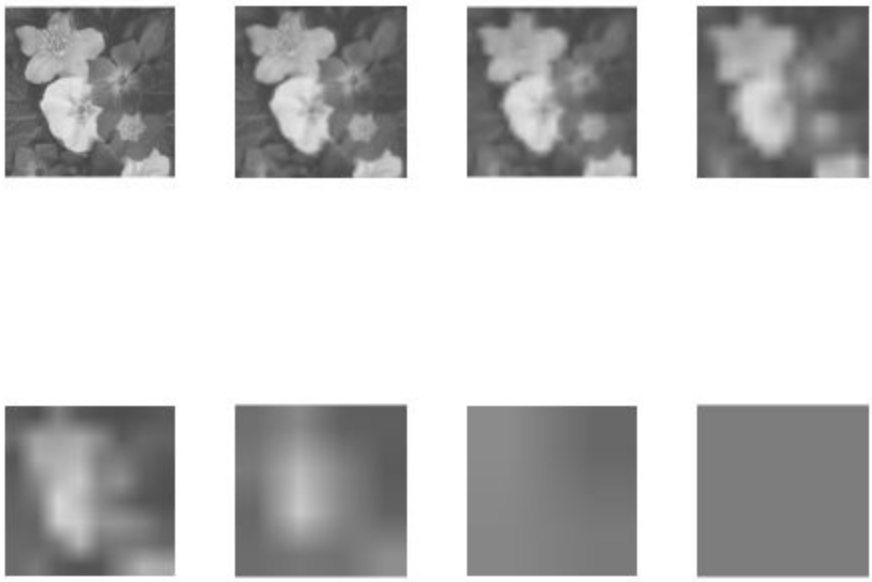
Answer: There is no change between the imfilter function and the conv2 function, because they use the same filter with the same value.

Part 1 Gaussian Pyramid

CARTOON

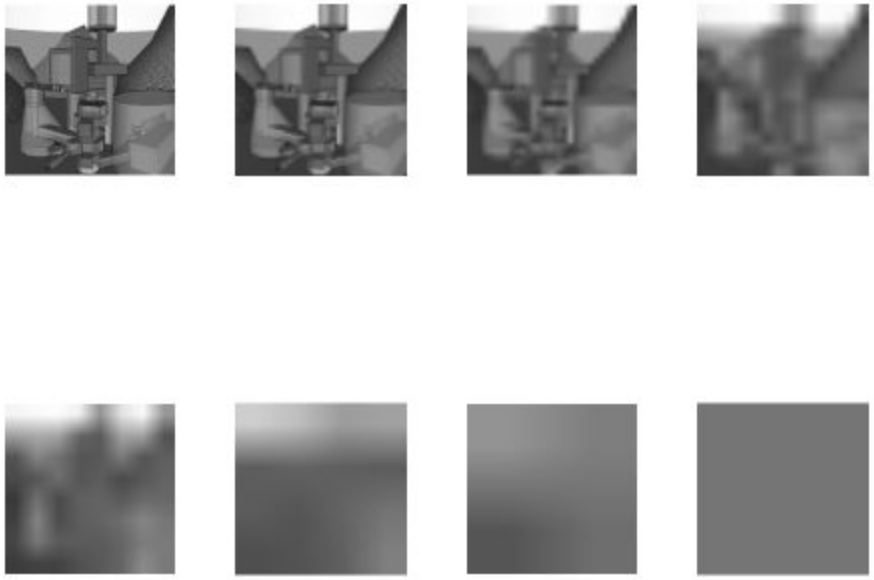


Flowergray

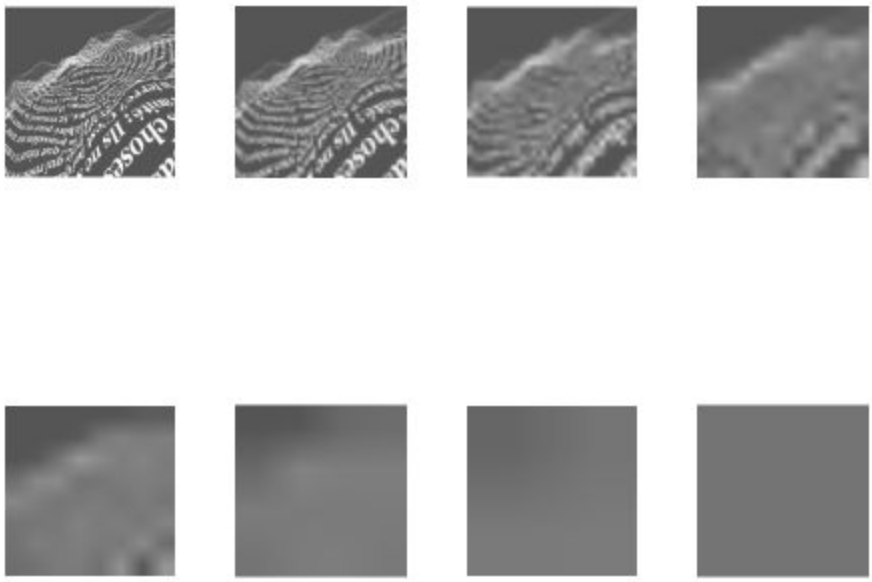


Kitty

Polarcities

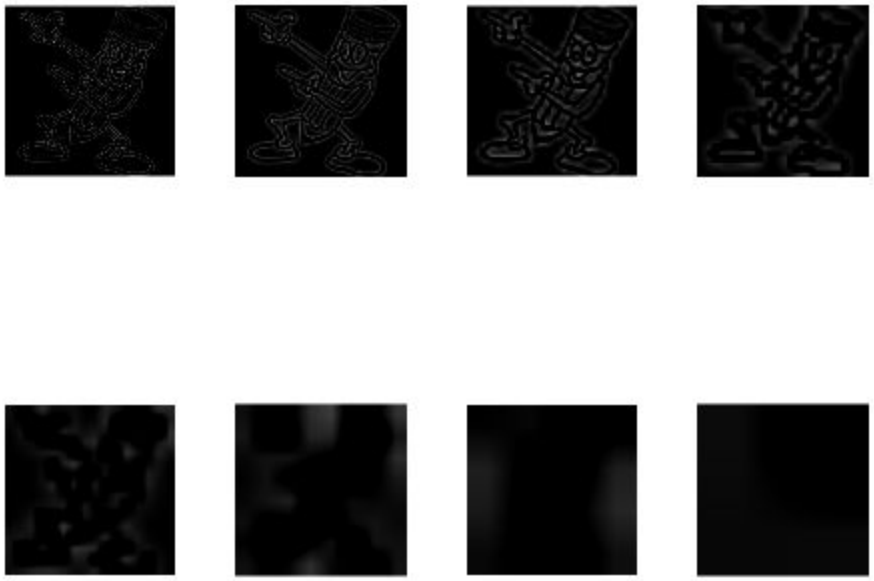


Text

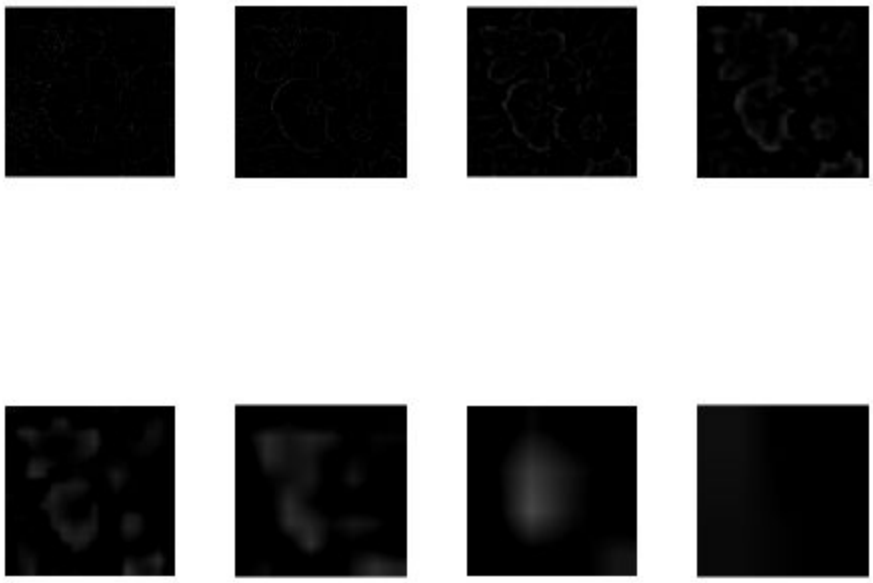


Part 2 Laplacian Pyramid

CARTOON

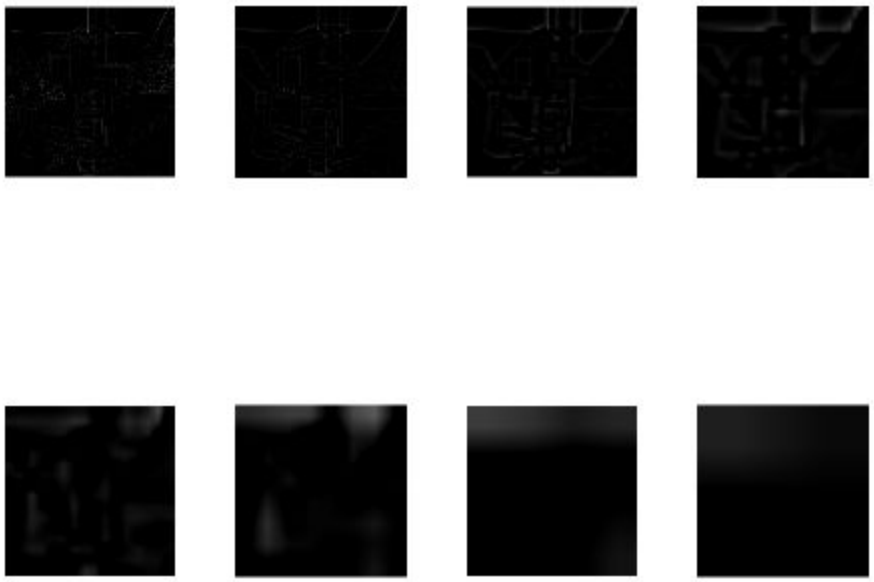


Flowergray

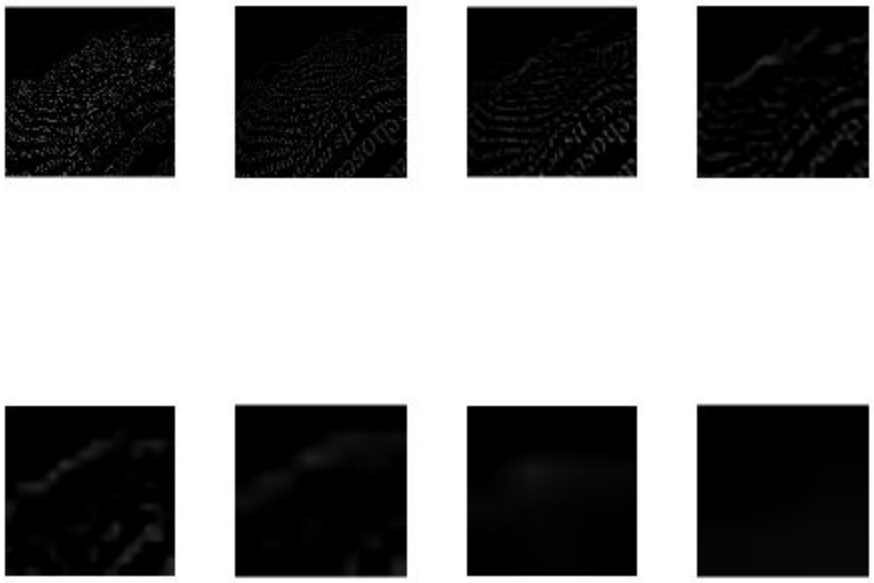


Kitty

Polarcities

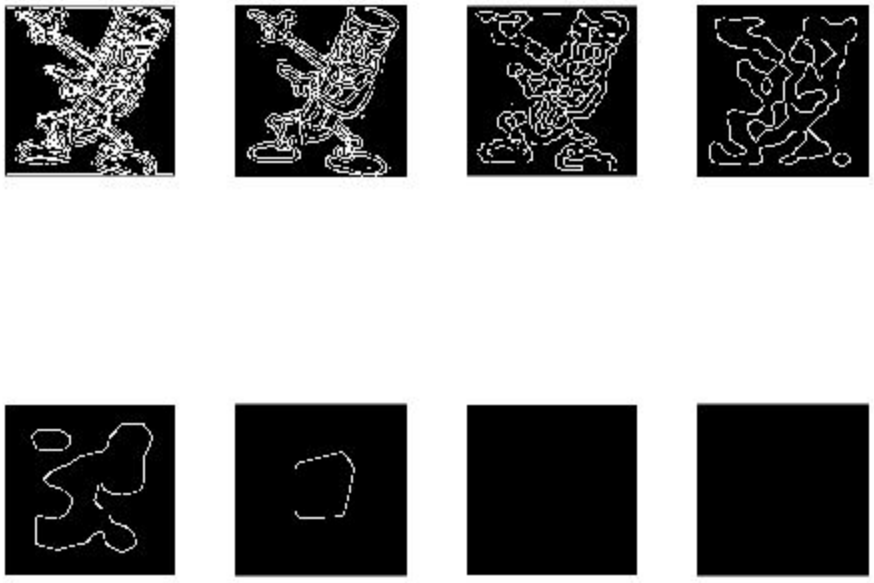


Text

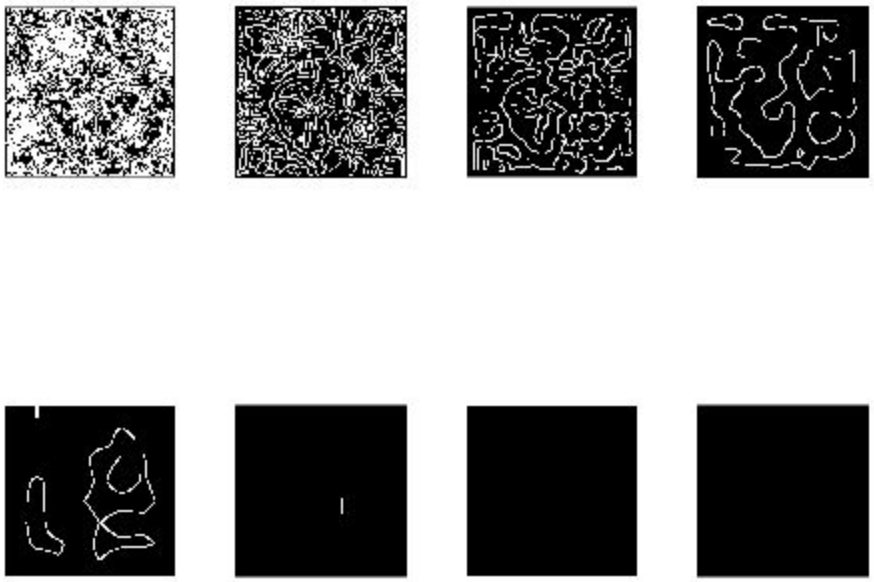


Part 3 Multi-Scale Edge Detection

CARTOON



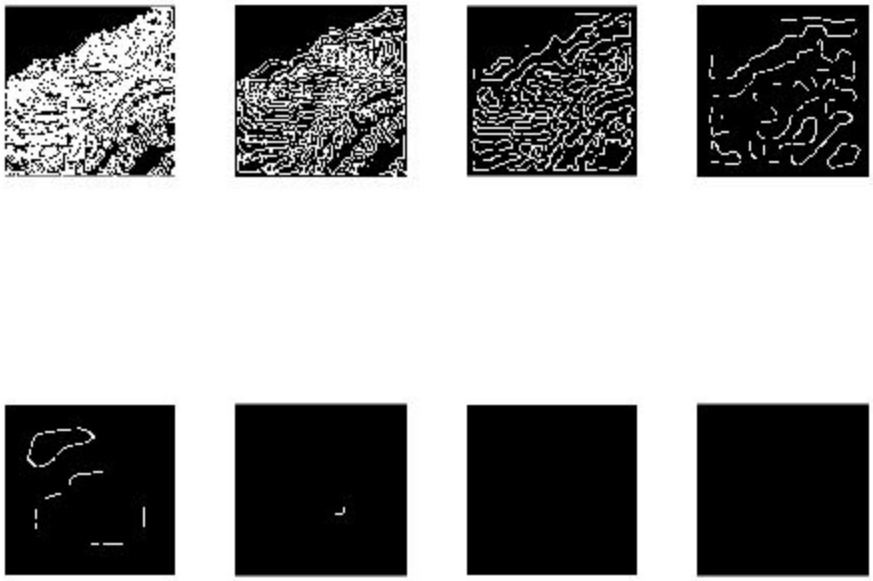
Flowergray



Kitty

Polarcities

Text



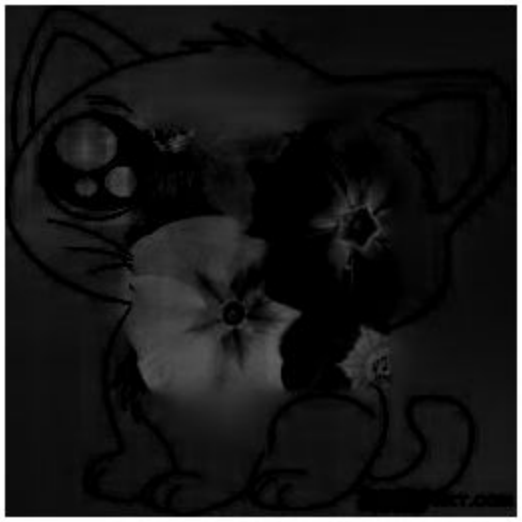
Part 4 Multi-Resolution Spline

Pair 1

1. Original Image

2. Masks

3. Result

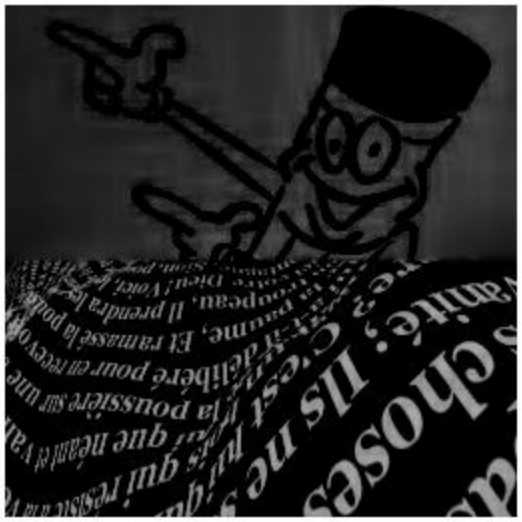


Pair 2

1. Original Image

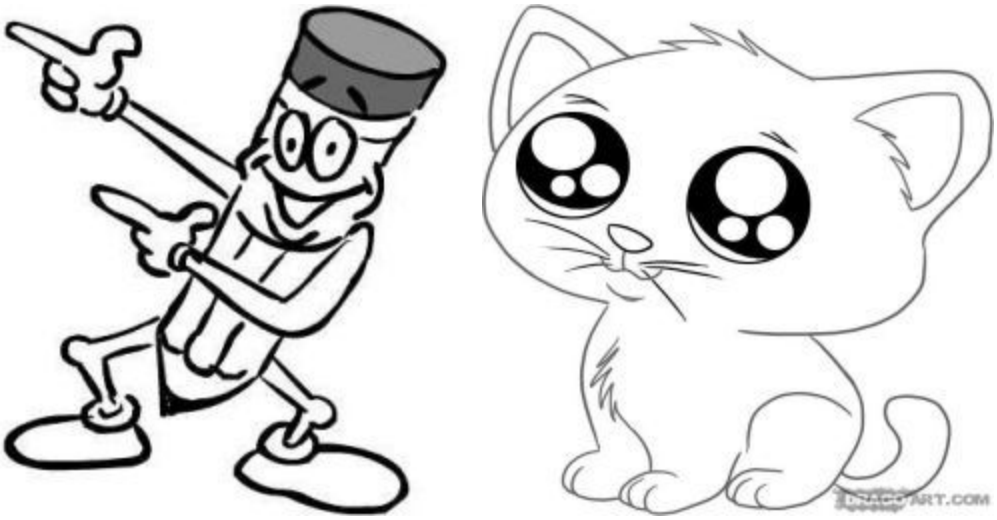
2. Mask

3. Result



Pair 3

1. Original Image



2. Mask

3. Result Image

Team Contribution

Kun Han:

- Student ID: 90607203
- Role: Main Program design and implementation, testing

Ziyuan Cui:

- Student ID: 47335412
- Role: function design and implementation, report