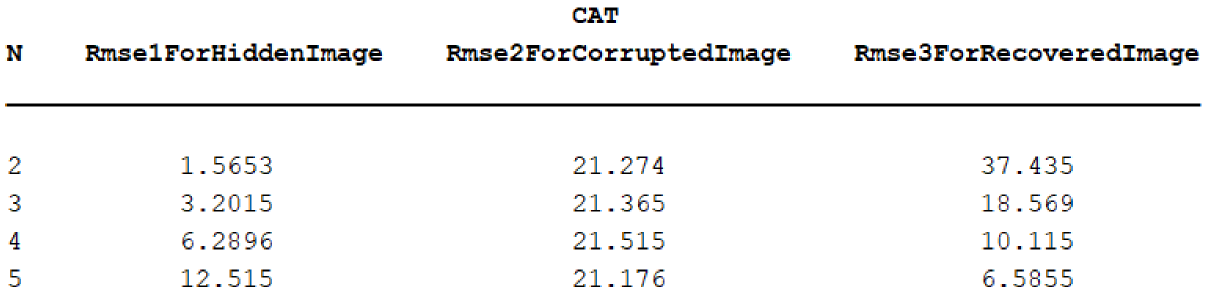
HOMEWORK 2 REPORT

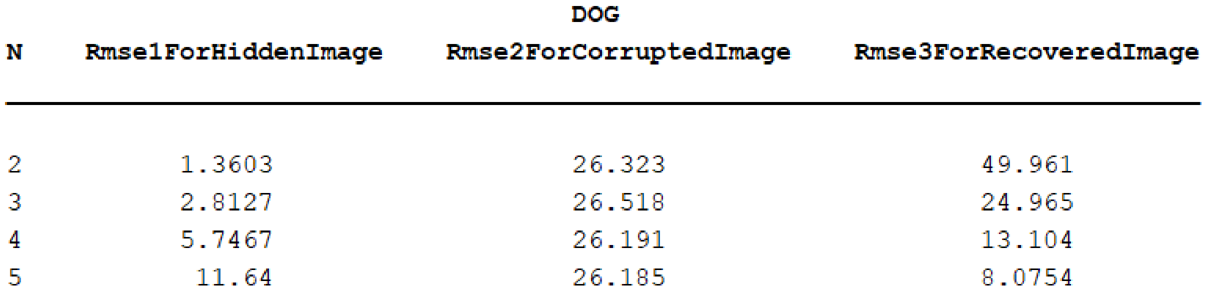
TABLES

Below are the tables per image. The sequence for columns is as given in the documentation, from left to right being mentioned in the 3,4,5th bullet points in documentation.



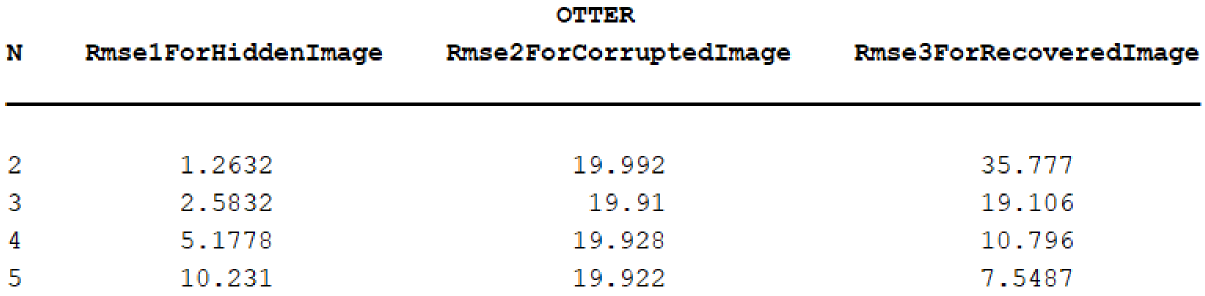
```
                                        CAT
 N     Rmse1ForHiddenImage    Rmse2ForCorruptedImage    Rmse3ForRecoveredImage
 ______________________________________________________________________________

 2           1.5653                  21.274                    37.435
 3           3.2015                  21.365                    18.569
 4           6.2896                  21.515                    10.115
 5           12.515                  21.176                    6.5855
```



```
                                        DOG
 N     Rmse1ForHiddenImage    Rmse2ForCorruptedImage    Rmse3ForRecoveredImage
 ______________________________________________________________________________

 2           1.3603                  26.323                    49.961
 3           2.8127                  26.518                    24.965
 4           5.7467                  26.191                    13.104
 5            11.64                  26.185                    8.0754
```

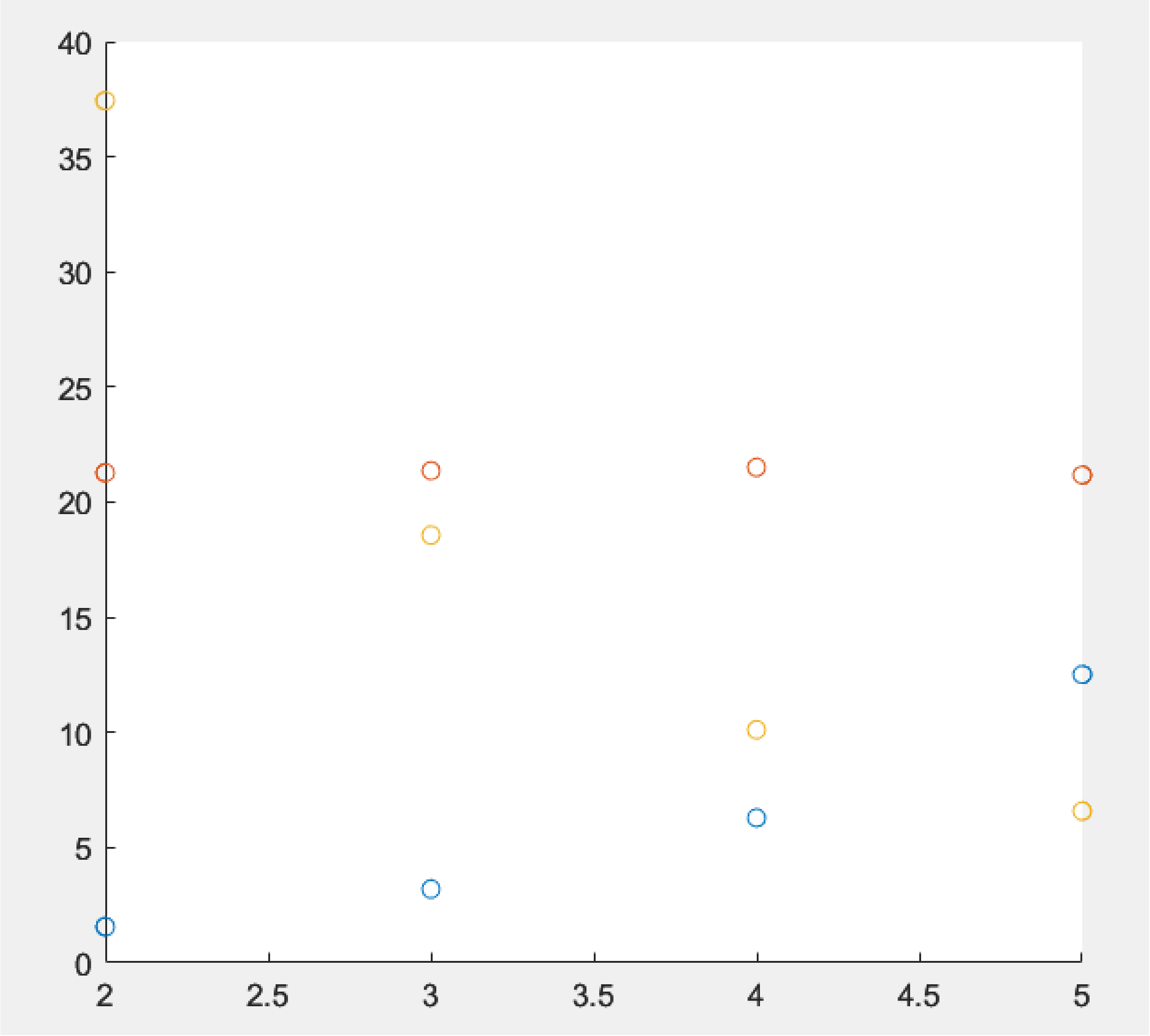


```
                                       OTTER
 N     Rmse1ForHiddenImage    Rmse2ForCorruptedImage    Rmse3ForRecoveredImage
 ______________________________________________________________________________

 2           1.2632                  19.992                    35.777
 3           2.5832                   19.91                    19.106
 4           5.1778                  19.928                    10.796
 5           10.231                  19.922                    7.5487
```

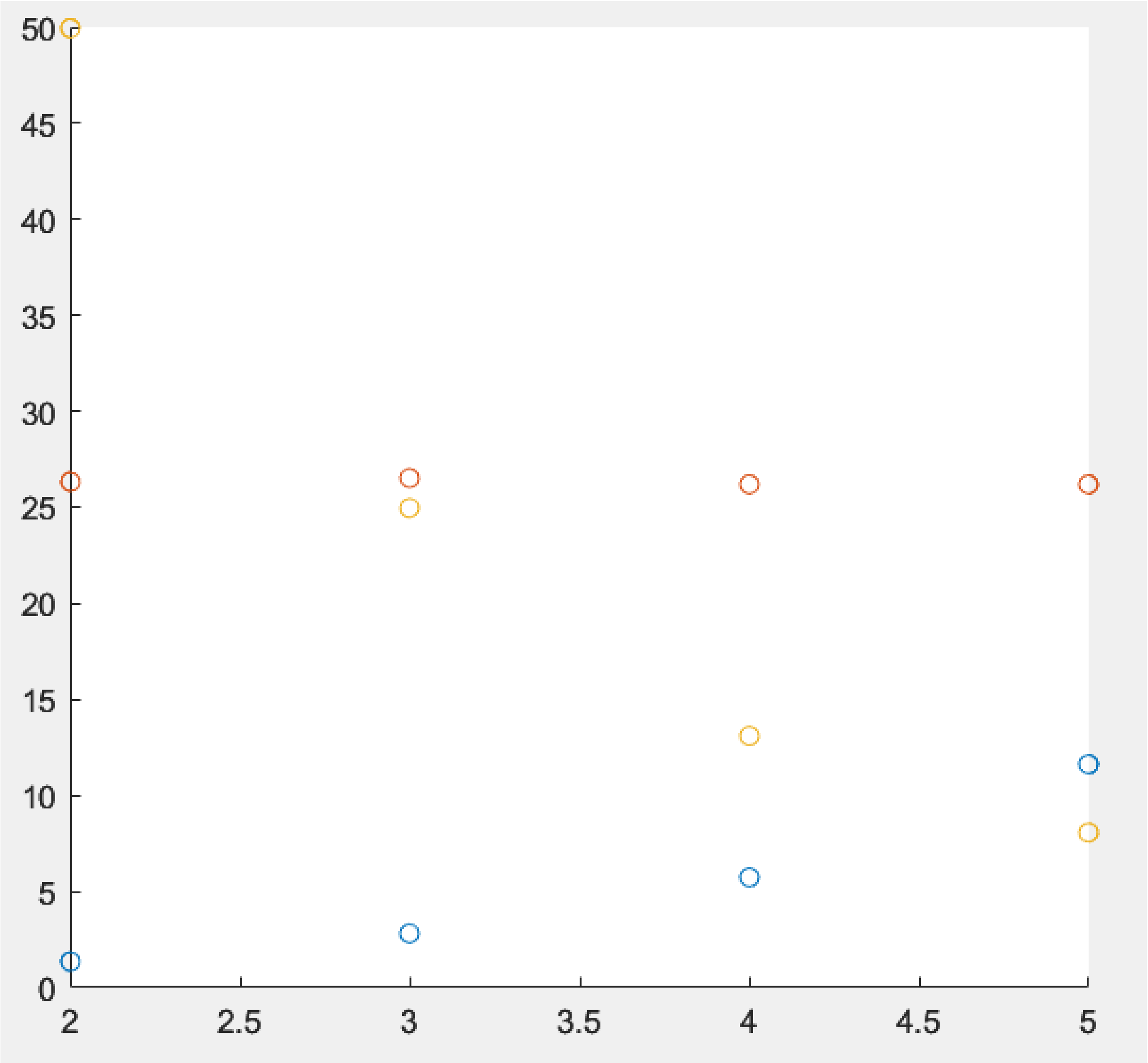
PLOTS

CAT:



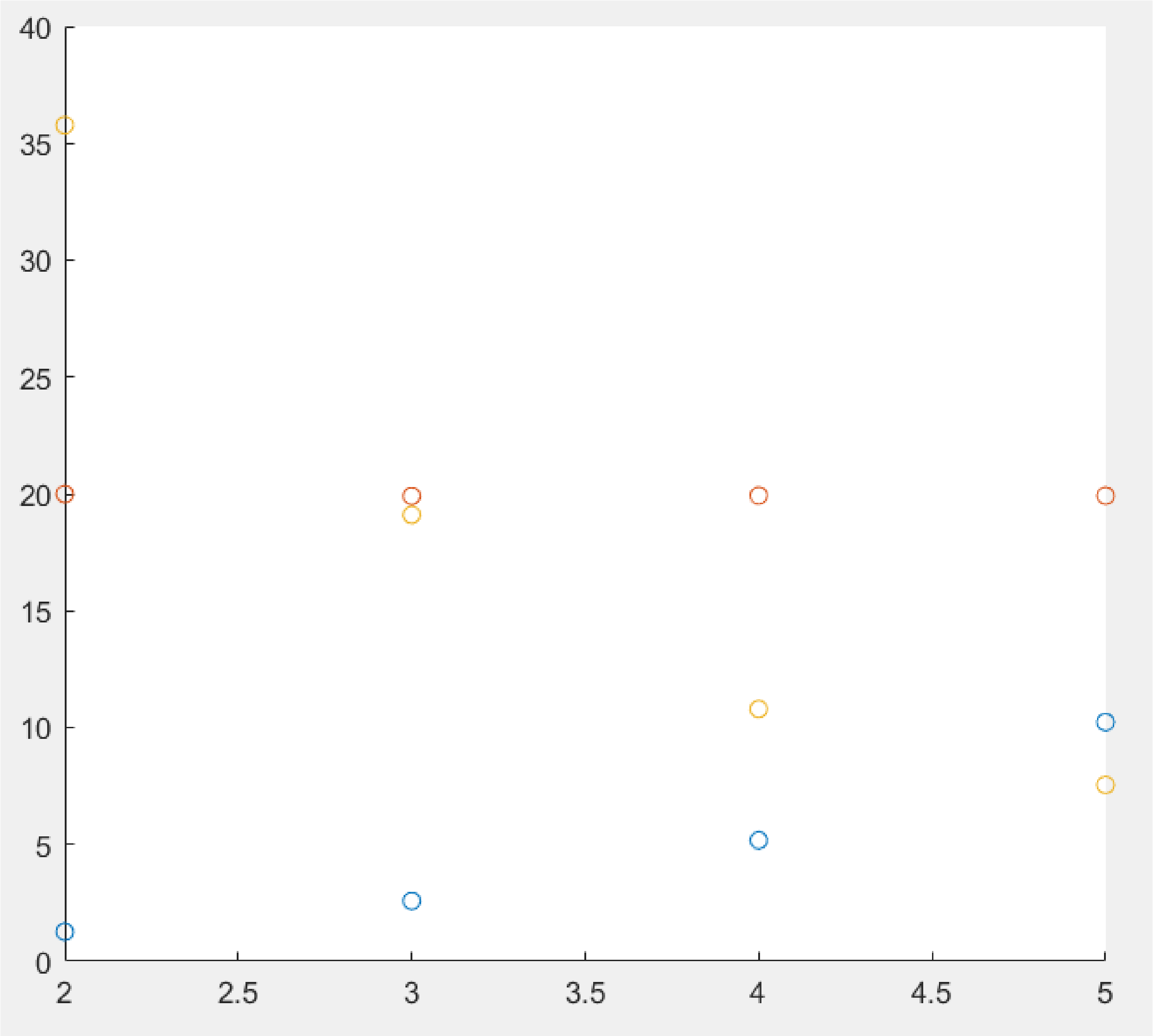
Yellow: Rmse3ForRecoveredImage Blue: Rmse1ForHiddenImage Orange: Rmse2ForCorruptedImage

DOG:



Yellow: Rmse3ForRecoveredImage   Blue: Rmse1ForHiddenImage   Orange: Rmse2ForCorruptedImage

OTTER:

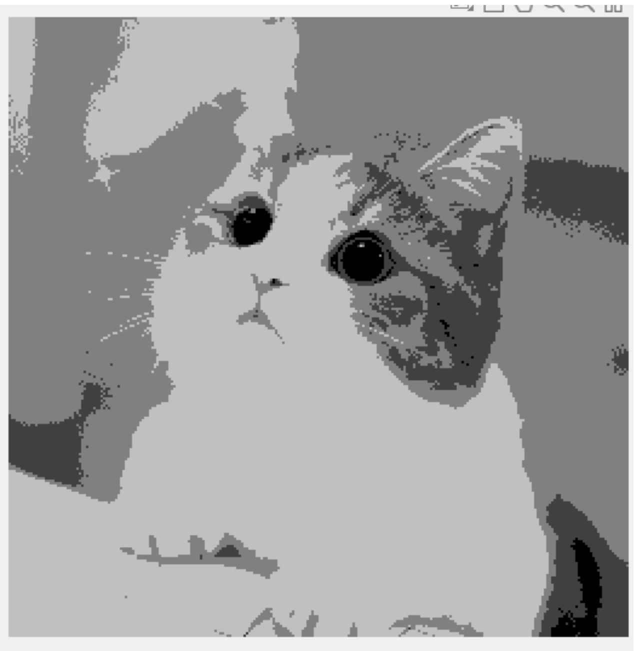


Yellow: Rmse3ForRecoveredImage Blue: Rmse1ForHiddenImage Orange: Rmse2ForCorruptedImage

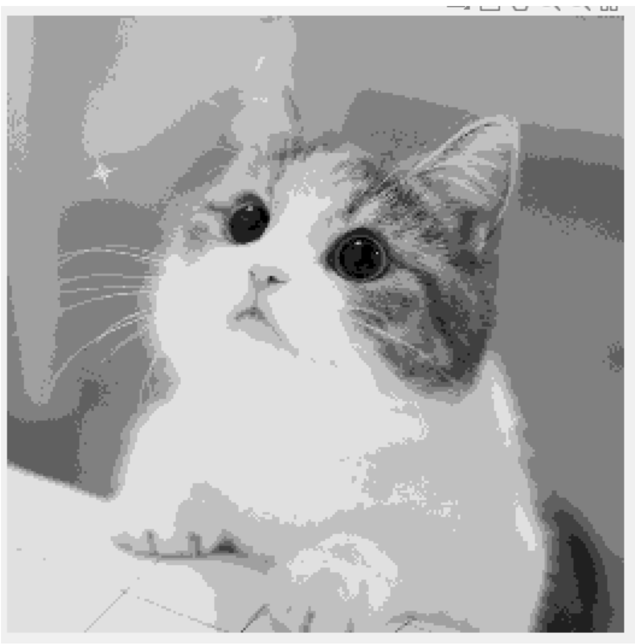
RECOVERED IMAGES

CAT:

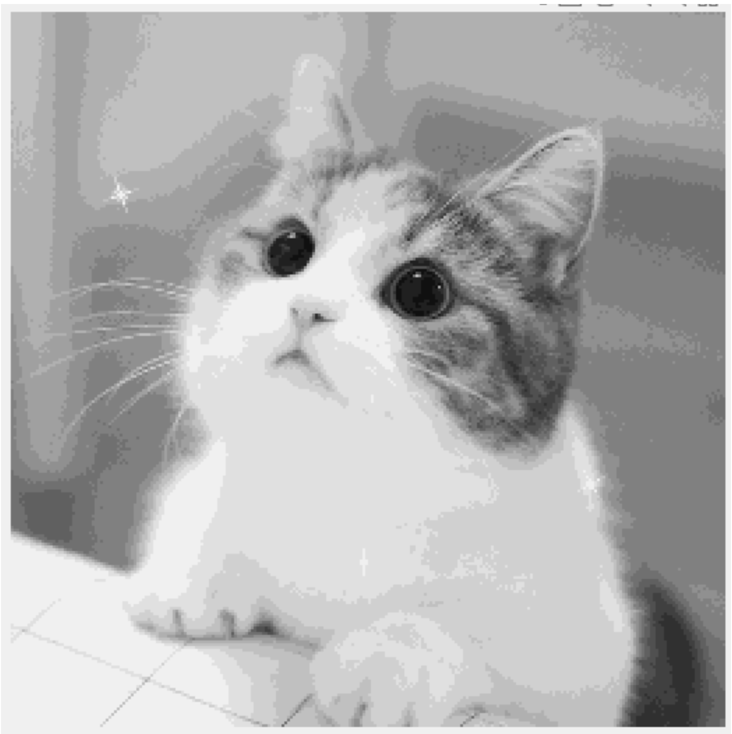
- For n = 2:



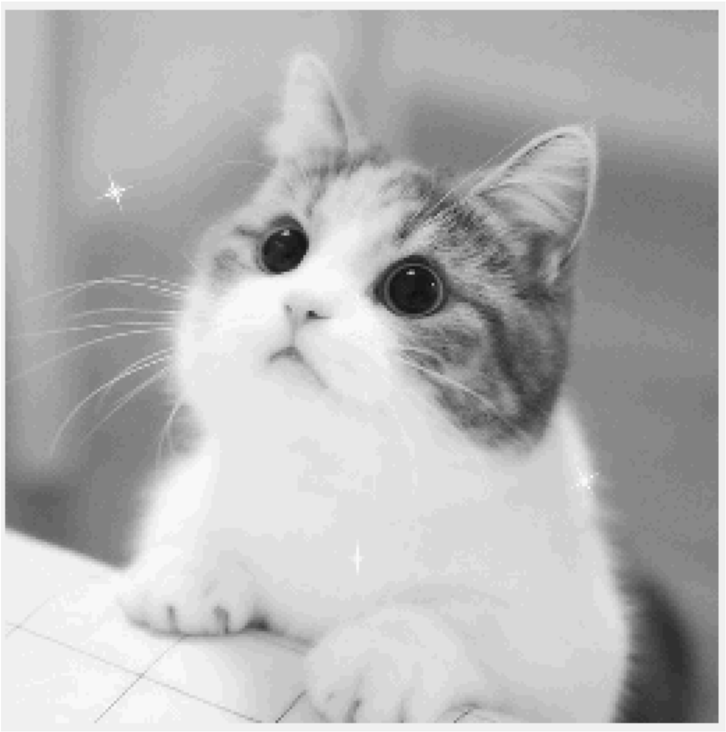
- For n = 3:



- For n = 4:

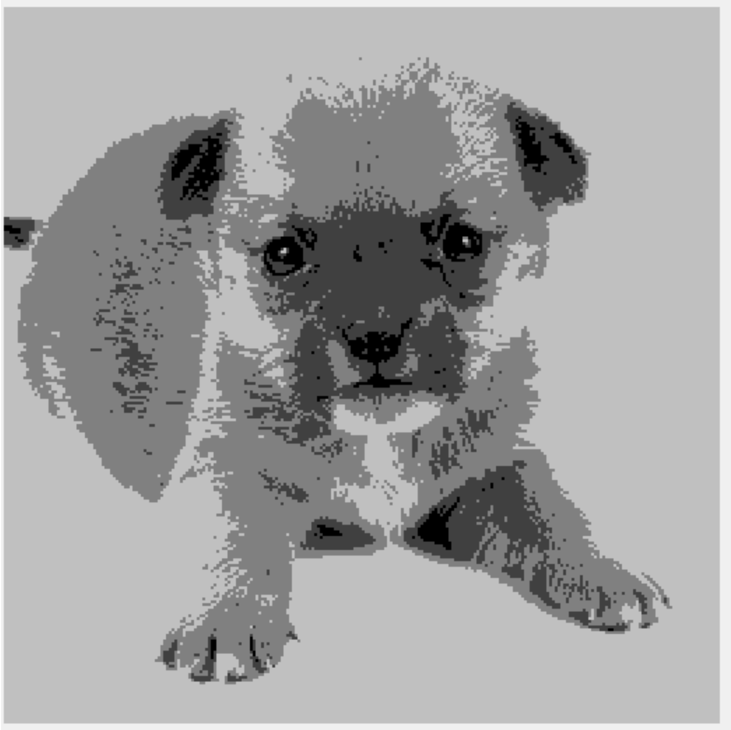


- For n = 5:

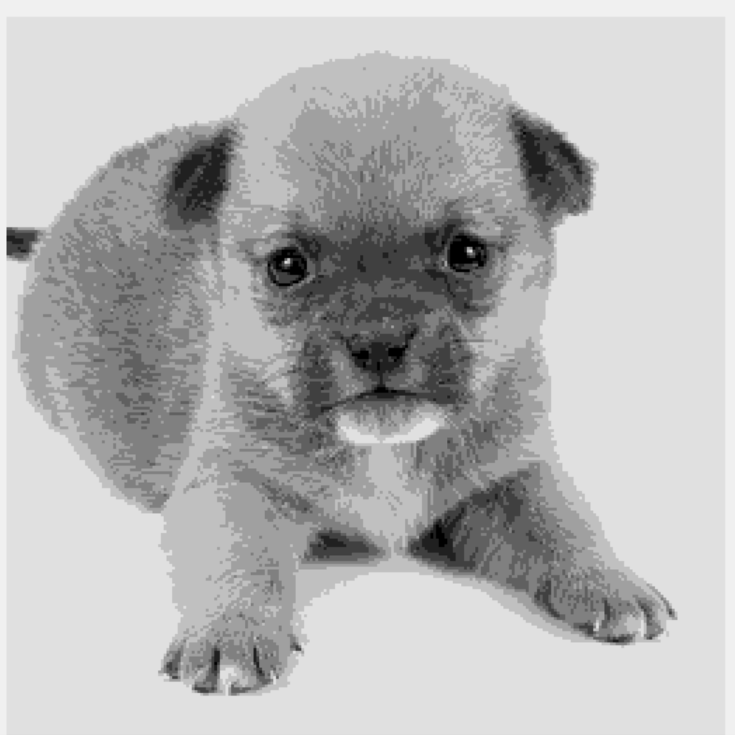


DOG:

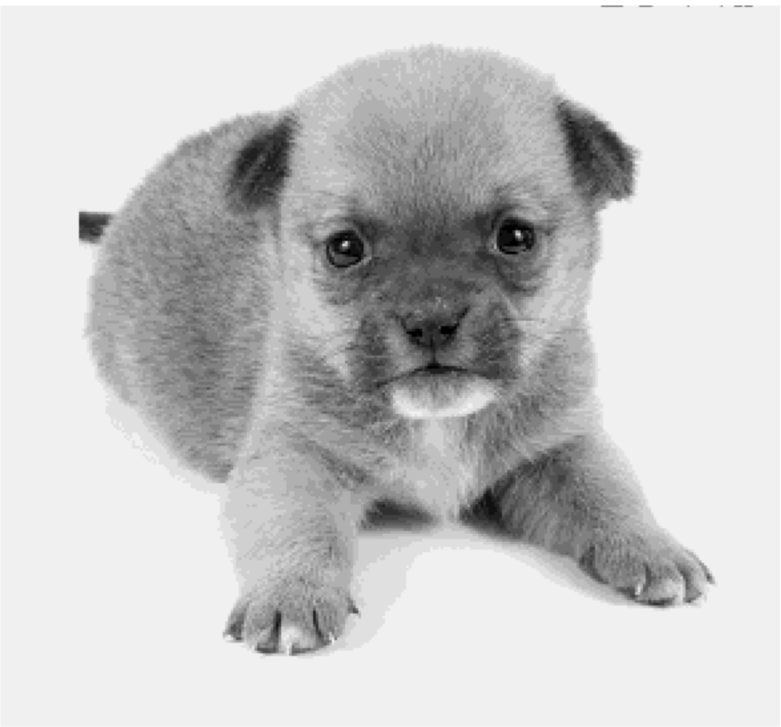
- For n = 2:



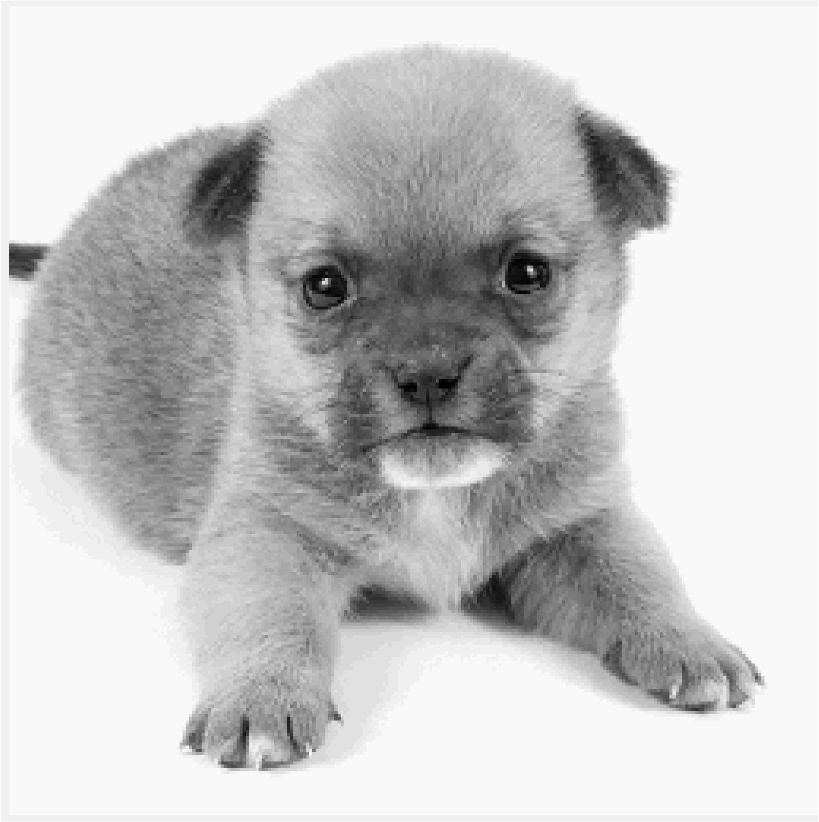
- For n = 3:



- For n = 4:

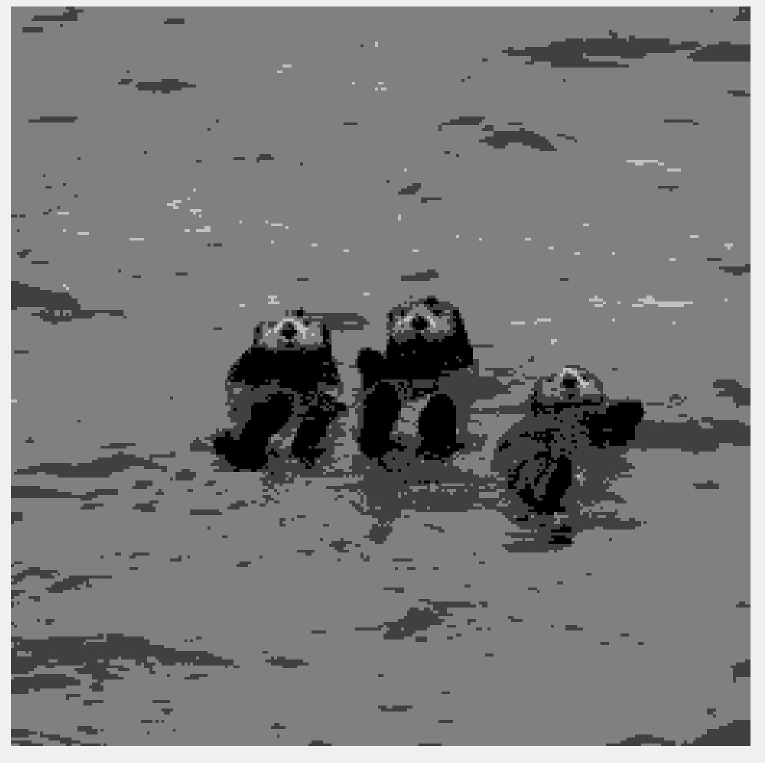


- For n = 5:

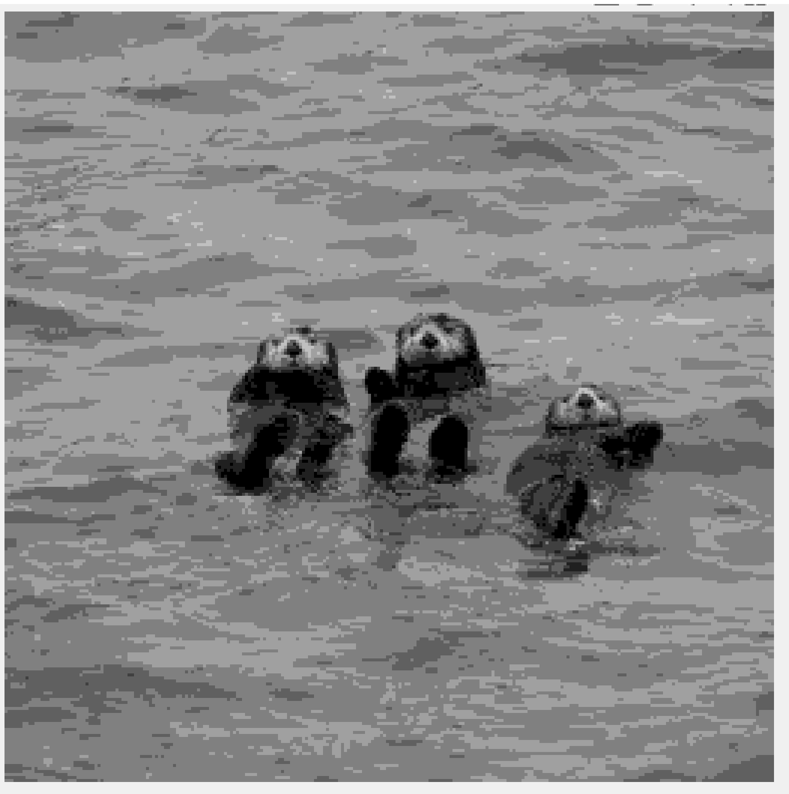


OTTER:

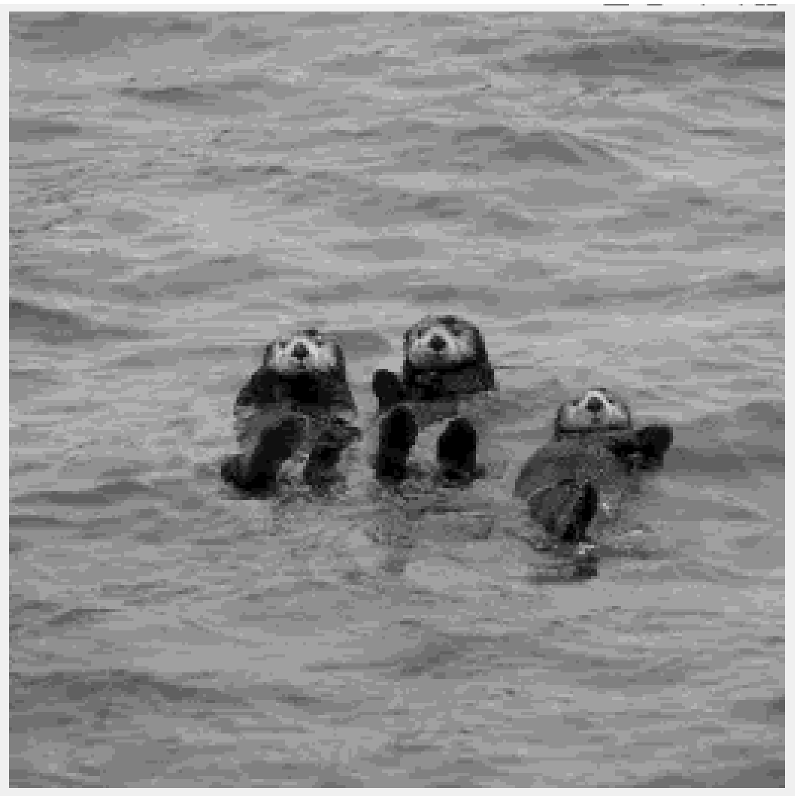
- For n = 2:



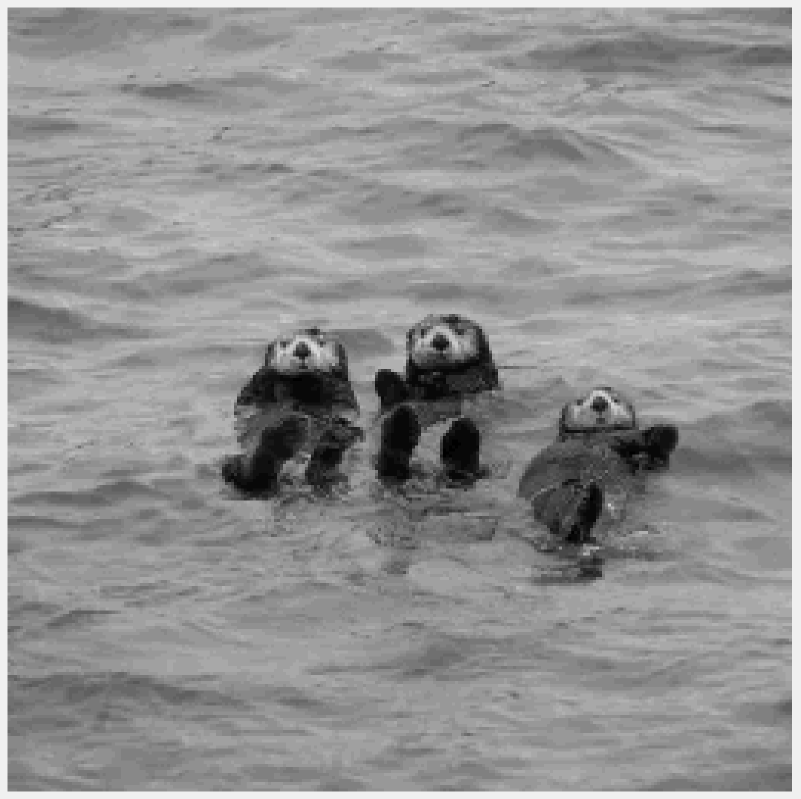
- For n = 3:



- For n = 4:



- For n = 5:



COMMENTARY ON RESULTS

Examining the plots, I see that as the RMSE values for each image group is demonstrating a linear distribution trend.

Also as n grew, the embedded recovery pictures were more visible behind the original image.

For the same values, the sign of the linear function covering the dots per n value are the same:

For corrupted image, the RMSE value follows a horizontal trend.

For the image in which the recovery image is embedded, the RMSE value follows a positive signed incline.

For the recovered image, the RMSE value follows a negative slope trend.

The numerical tables were identical except for the names of the tables. This reflects that the values are even independent from the picture itself and related to what we are doing on that image.

Apart from the outcomes I gain from the plots and tables, I saw when I was debugging first hand that information loss happens as I try to embed data. So an analogy of finite memory can be made in this special case. The quality for savior photo and hiding photo are inversely dependent and error prunity increases the quality.

The corruption RMS being close to stable is quite logical since it is only related to the corrupted subpart and doesn't vary with n. The slight changes are most probably related to floating point calculations.

The RMSE for original containing embedded recovery image and recovered image are negatively correlated. This is due to them being dependent on the bit number chosen via parameter n. If n increases, original image with embedded recovery image looses its original data more, giving it up to embedded image. At the same time, the embedded recovery image increases the data it contains. A data increase implies an increase in resolution.

Also, the darker the general tone of picture is, the more the resolution drops as n increase. This is because when darker, the lower bits contain the most significant values.
Beware that the clash of two lines, the one for RMSE3 and RMSE1, differ per picture and thus means is related to individuality of picture.