HOMEWORK 2 ERROR CONCEALMENT IN IMAGES

STUDENT REPORT

PREPARED BY: VOLKAN OZTURK 2019400033

Image 1: (cat.png)

N=2:

Original image	Transmitted image	Corrupted image	Recovered image
			

N=3:

Original image	Transmitted image	Corrupted image	Recovered image
			

N=4:

Original image	Transmitted image	Corrupted image	Recovered image




N=5:

Original image	Transmitted image	Corrupted image	Recovered image




RMSE TABLE FOR CAT.PNG

CAT	RMSE1*	RMSE2*	RMSE3*
N=2	1.5653	22.9848	37.4346
N=3	3.2015	23.1460	18.5688
N=4	6.2896	23.7477	10.1153
N=5	12.5151	26.0008	6.5855

RMSE1: Between original image & Transmitted image.
RMSE2: Between original image & Corrupted image.
RMSE3: Between original image & Recovered image.

RMSE STATISTICS OF THE CAT.PNG

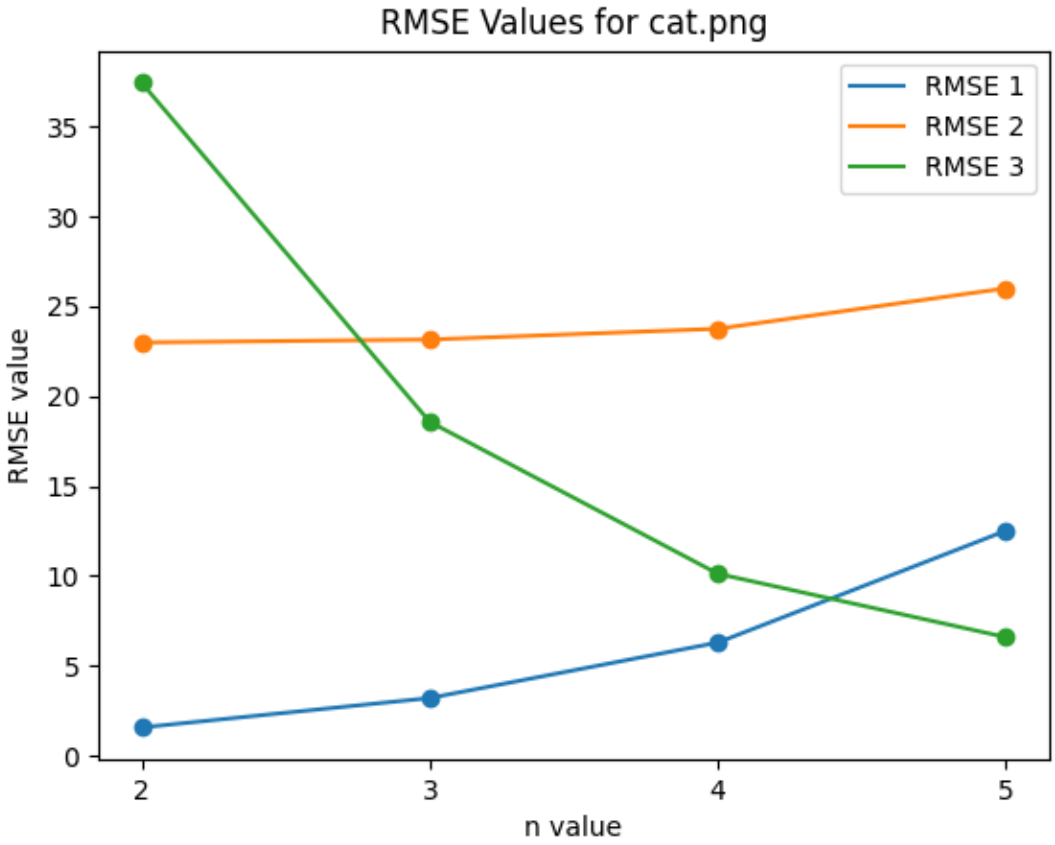


Image 2: (dog.png)

N=2:

Original image	Transmitted image	Corrupted image	Recovered image

N=3:

Original image	Transmitted image	Corrupted image	Recovered image
			

N=4:

Original image	Transmitted image	Corrupted image	Recovered image
			

N=5:

Original image	Transmitted image	Corrupted image	Recovered image
			

RMSE TABLE FOR DOG.PNG

DOG	RMSE1*	RMSE2*	RMSE3*
N=2	1.3603	32.7159	49.9611
N=3	2.8127	32.8030	24.9647
N=4	5.7467	33.1605	13.1039
N=5	11.6397	34.5591	8.0754

RMSE STATISTICS OF THE DOG.PNG

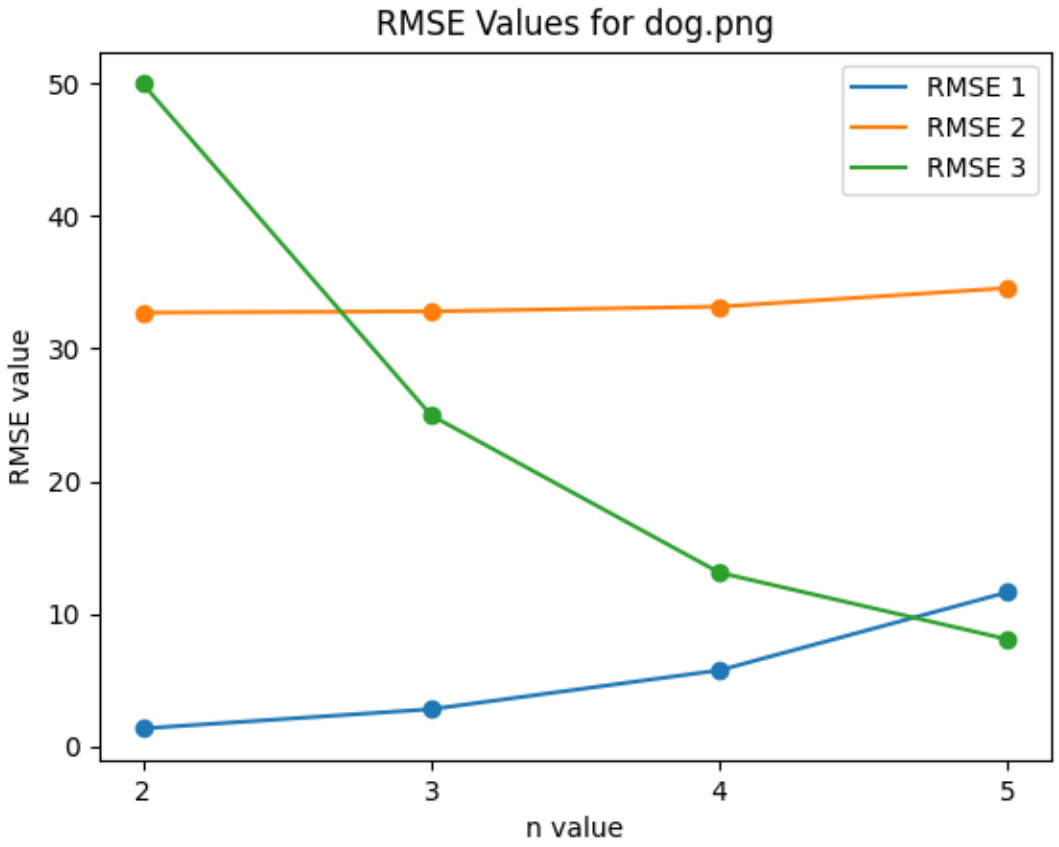


Image 3: (otter.png)

N=2:

Original image	Transmitted image	Corrupted image	Recovered image




N=3:

Original image	Transmitted image	Corrupted image	Recovered image




N=4

Original image	Transmitted image	Corrupted image	Recovered image




N=5:

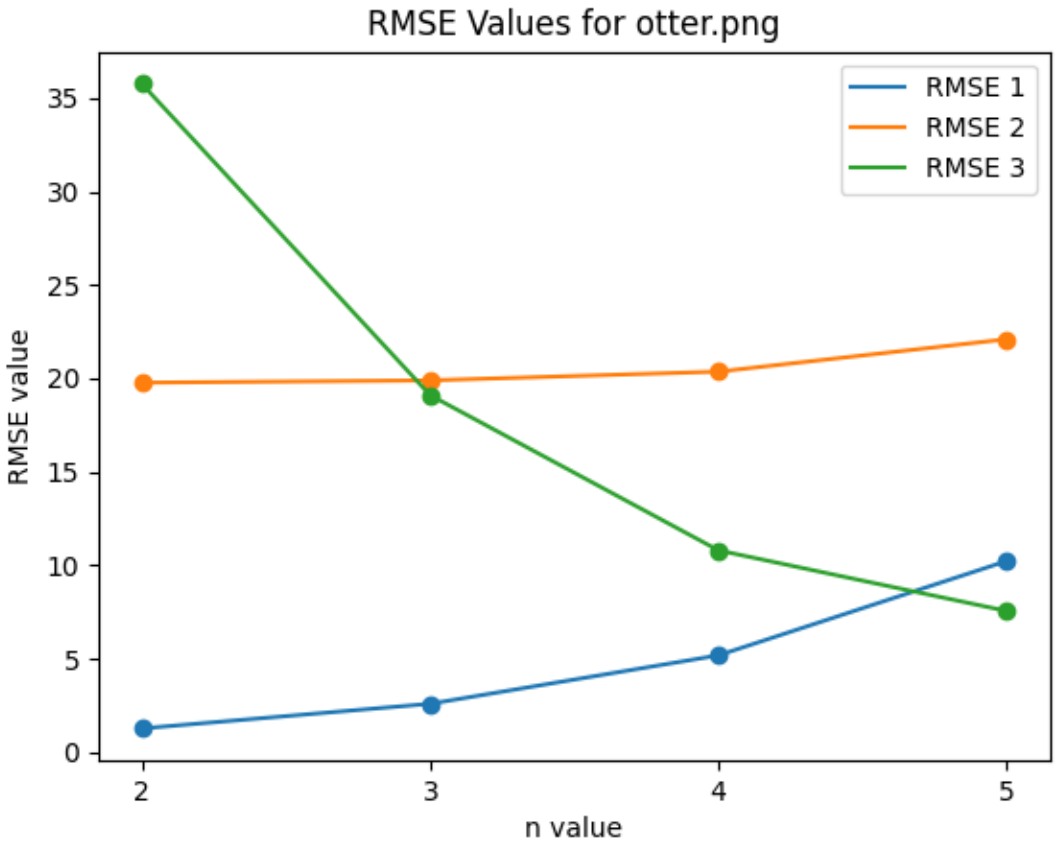
Original image	Transmitted image	Corrupted image	Recovered image




RMSE TABLE FOR OTTER.PNG

OTTER	RMSE1*	RMSE2*	RMSE3*
N=2	1.2632	19.7753	35.7770
N=3	2.5832	19.8959	19.1056
N=4	5.1778	20.3657	10.7960
N=5	10.2307	22.1014	7.5487

RMSE STATISTICS OF THE OTTER.PNG



SHORT ANALYSIS OF THE REPORT

1) Difference between original image and the transmitted image. (RMSE 1):

   RMSE 1 increases as n increases because; we sacrifice n many least significant bits of the original image to store the hidden image.

2) Difference between original image and the corrupted image. (RMSE 2):

   RMSE 2 increases as n increases because; the difference between transmitted image and the corrupted image is that we have 30 rows corrupted. So, same reasoning applies from RMSE 1. Also, we have additional error caused by this corruption, and this makes RMSE 2 values much higher than RMSE 1 values. (The increase with respect to n is not as significant as RMSE1 because, the corruption of 30 row (which exists in all versions regardless from n) is the main cause of the RMSE value.)

3) Difference between original image and the recovered image. (RMSE 3):

   RMSE 3 decreases as n increases because; we had stored n many most significant bits as hidden, thus as n increases, our precision increases also.