

DSAA ASSIGNMENT 3

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Roll No.: **201501090**
CSE

2.

for (45,420),

outputimage =

196	202	195	192	126	76	55	42
195	198	197	189	133	78	57	51
199	200	199	194	149	83	54	43
193	201	193	195	157	80	52	55
200	195	202	197	149	71	49	60
192	204	201	197	139	65	59	45
191	193	198	192	127	67	60	58
193	192	199	190	127	72	74	62

outputDCT =

287.7500	248.6693	-12.8347	-81.3074	3.5000	38.6439	-5.5076	-29.6091
4.1718	3.0647	1.7974	5.1075	2.3008	-5.3716	-4.8122	0.6541
-15.3957	-0.9591	14.9121	-6.4836	-11.9804	10.2532	7.2552	-11.1191
0.2433	2.9303	2.2072	-4.6059	-3.9145	2.5832	-0.1947	-5.6933
1.0000	-0.8022	-1.4022	2.9298	3.7500	-0.3188	-0.7722	1.5154
-1.1389	-1.9458	-1.2578	0.7296	0.3654	-2.7581	-4.3026	-2.6733
5.2947	3.6561	-1.2448	-0.8679	-0.1789	-2.2374	-2.4121	-0.3939
1.1684	1.8005	1.2375	0.4751	2.2638	5.2466	5.1065	2.2993

quantisedDCT =

9	11	-1	-3	0	0	0	0
0	0	0	0	0	0	0	0
-1	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0

reconstructed =

183.0081	195.9551	200.1918	179.4677	143.9191	119.3683	118.1930	127.3132
185.6869	198.6339	202.8706	182.1465	146.5979	122.0471	120.8718	129.9920
189.4752	202.4222	206.6589	185.9349	150.3863	125.8354	124.6602	133.7803
192.1540	205.1010	209.3377	188.6137	153.0651	128.5142	127.3390	136.4591
192.1540	205.1010	209.3377	188.6137	153.0651	128.5142	127.3390	136.4591
189.4752	202.4222	206.6589	185.9349	150.3863	125.8354	124.6602	133.7803
185.6869	198.6339	202.8706	182.1465	146.5979	122.0471	120.8718	129.9920

183.0081 195.9551 200.1918 179.4677 143.9191 119.3683 118.1930 127.3132

error =

331.6851

for (298,427):

outputimage =

188 194 186 173 164 169 180 187
186 173 153 158 172 195 204 211
177 164 176 186 207 210 216 216
178 179 197 197 196 205 201 206
158 179 173 186 183 184 194 187
171 158 177 180 185 179 178 182
176 174 183 177 174 180 176 181
183 184 170 180 177 172 182 174

outputDCT =

446.6250 -49.0223 12.6057 1.4379 1.3750 3.5618 0.0552 0.0240
25.7629 -22.1644 25.4454 4.5105 -3.1688 -3.2109 2.3184 -0.7493
-28.8857 35.1789 28.5323 2.0974 -1.6816 -1.7996 -4.7808 -2.4104
-34.1907 25.2713 -0.5697 -14.2621 -3.6621 -1.2602 1.1090 -0.7632
3.8750 26.8691 -5.9664 -15.5617 -9.3750 -1.0841 -11.4644 -5.8650
18.2917 15.1930 -12.4891 -13.5383 -2.0626 1.4619 14.5360 4.1699
5.0646 0.1480 -13.7808 -0.1134 8.6792 3.3819 -0.2823 8.4648
-1.4562 -4.0275 -4.8551 -2.6877 -4.2698 -1.9194 -8.6680 -0.5353

quantisedDCT =

14 -2 1 0 0 0 0 0
1 -1 1 0 0 0 0 0
-1 1 1 0 0 0 0 0
-1 1 0 0 0 0 0 0
0 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0

reconstructed =

201.9602 191.2579 175.6573 163.4372 160.6325 167.6704 179.3047 187.8604
177.7340 173.9577 169.8936 170.2806 177.9734 191.8008 206.7442 216.4083
166.9939 169.0694 173.9281 182.2781 193.8719 206.9444 218.4818 225.2798
177.1808 180.3049 185.4932 191.1297 195.7721 198.7137 200.0907 200.5197
179.0615 181.9039 185.9310 188.7971 188.8410 186.0558 182.0907 179.2818
168.2763 171.0761 175.4483 179.5940 182.0809 182.5303 181.6752 180.7787

```
171.0317 171.5702 172.7475 174.6421 177.1478 179.8831 182.2493 183.6286
186.8632 183.9453 179.5066 175.5703 173.6887 174.1482 175.9259 177.4036
```

error =

```
55.9534
```

ans =

```
1
```

for (230,30):

outputimage =

```
187 185 182 187 183 186 184 184
187 185 182 187 181 185 181 182
183 185 192 183 194 186 178 189
186 184 185 191 179 186 183 181
183 184 187 178 190 182 181 187
188 181 182 189 184 184 185 181
181 181 180 185 186 185 183 184
182 185 187 184 187 181 185 186
```

outputDCT =

```
459.1250  2.1864 -4.2647 -0.2507  4.6250 -1.3702  2.4430 -0.5847
 2.5832  4.1411  1.0057  1.1200 -0.2897 -0.2234  2.9370 -4.3226
-0.6553 -1.6590  1.5884  0.7154 -0.1469  1.3229 -3.4383 -2.2307
-3.0942 -0.6409  2.6488  5.2795  1.3822  4.8957 -2.6588 -2.4412
 0.3750  0.5310  2.6083 -2.3712 -2.6250  0.3442 -1.2157  1.0196
 0.2241 -1.6090 -2.4108  1.2012  0.0109  3.6724 -0.0564 -4.9516
 5.2775  0.4957 -1.6883 -1.5126  1.2785 -1.7092  1.4116  4.4922
 1.3750 -4.5171 -0.9893 -1.9659  0.9710 -12.8298  3.0179  9.4070
```

quantisedDCT =

```
14  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0
```

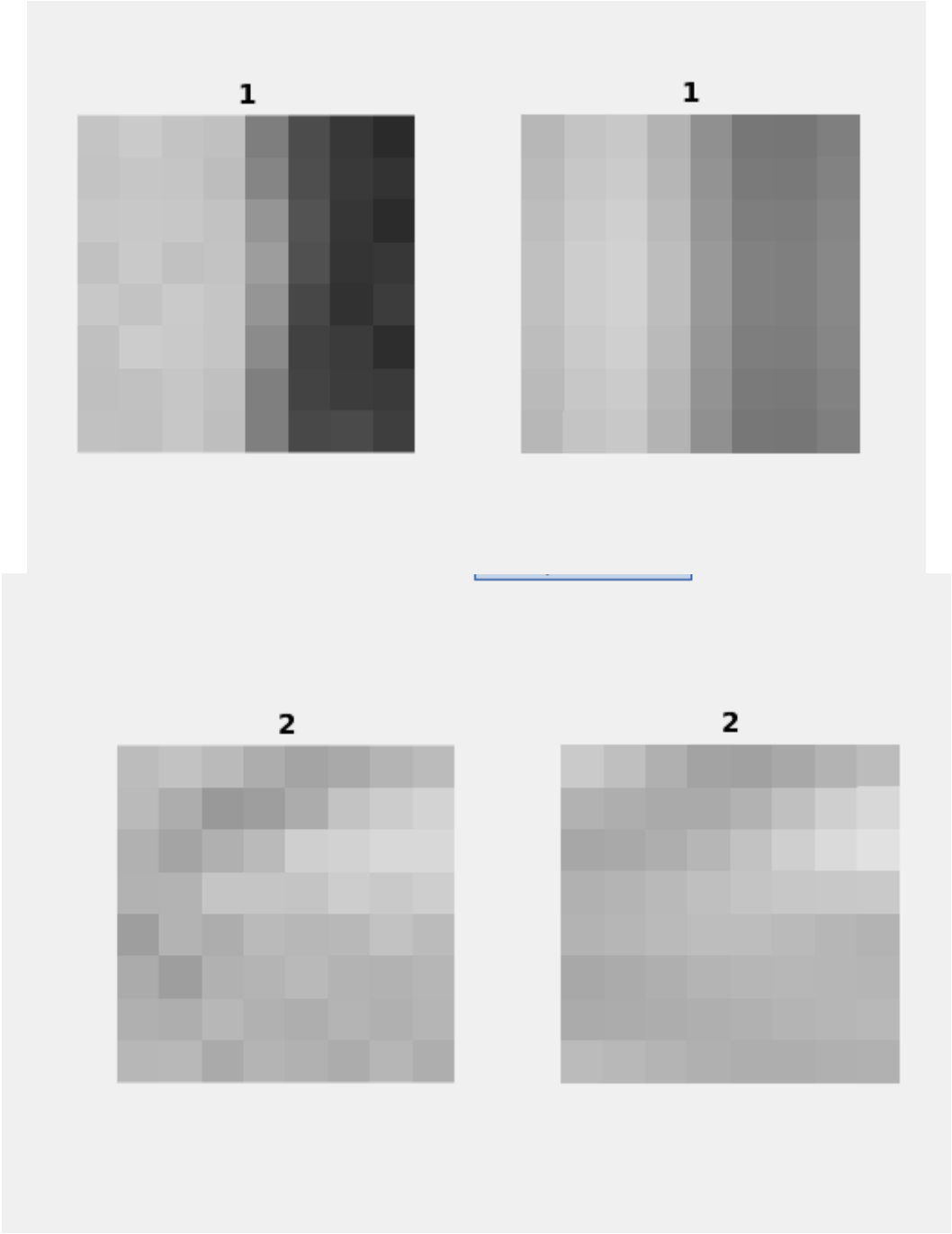
reconstructed =

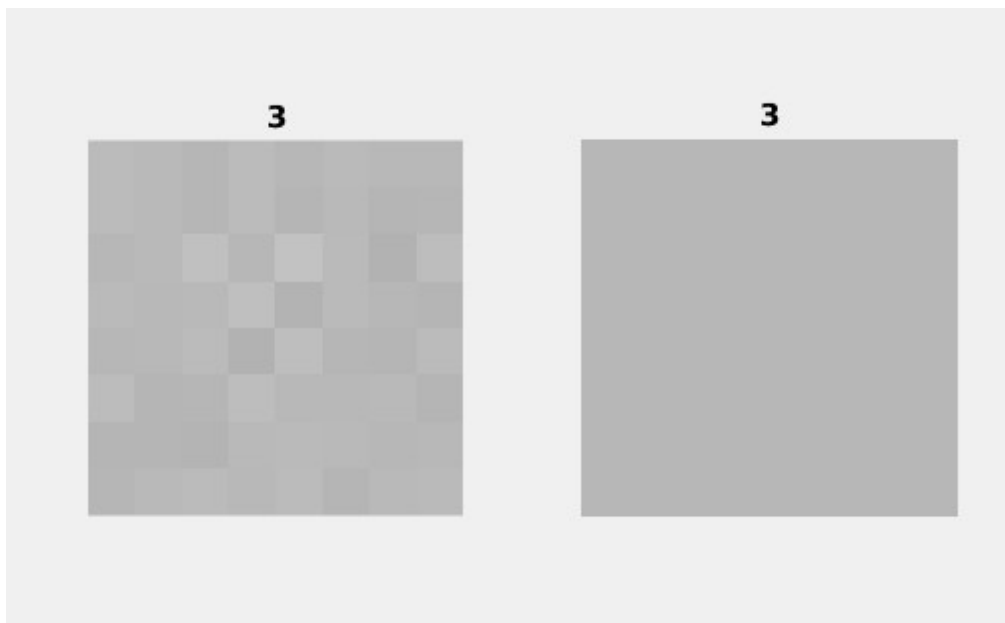
183.0000 183.0000 183.0000 183.0000 183.0000 183.0000 183.0000 183.0000
183.0000 183.0000 183.0000 183.0000 183.0000 183.0000 183.0000 183.0000
183.0000 183.0000 183.0000 183.0000 183.0000 183.0000 183.0000 183.0000
183.0000 183.0000 183.0000 183.0000 183.0000 183.0000 183.0000 183.0000
183.0000 183.0000 183.0000 183.0000 183.0000 183.0000 183.0000 183.0000
183.0000 183.0000 183.0000 183.0000 183.0000 183.0000 183.0000 183.0000
183.0000 183.0000 183.0000 183.0000 183.0000 183.0000 183.0000 183.0000
183.0000 183.0000 183.0000 183.0000 183.0000 183.0000 183.0000 183.0000

error =

27.5500

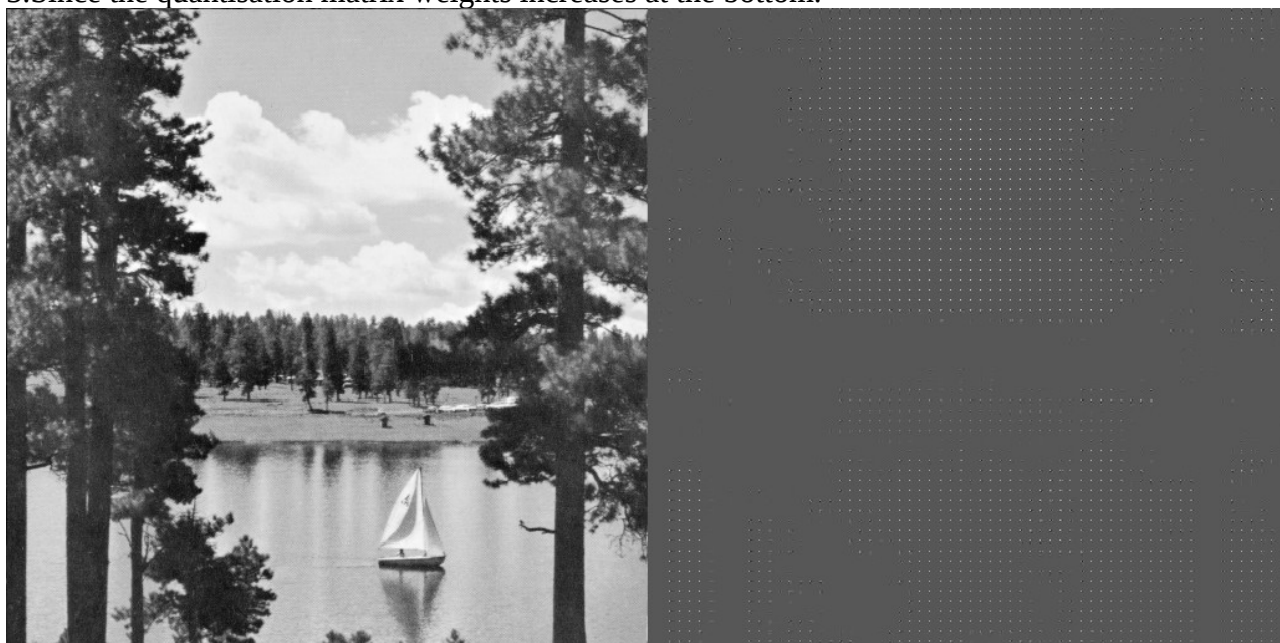
images are





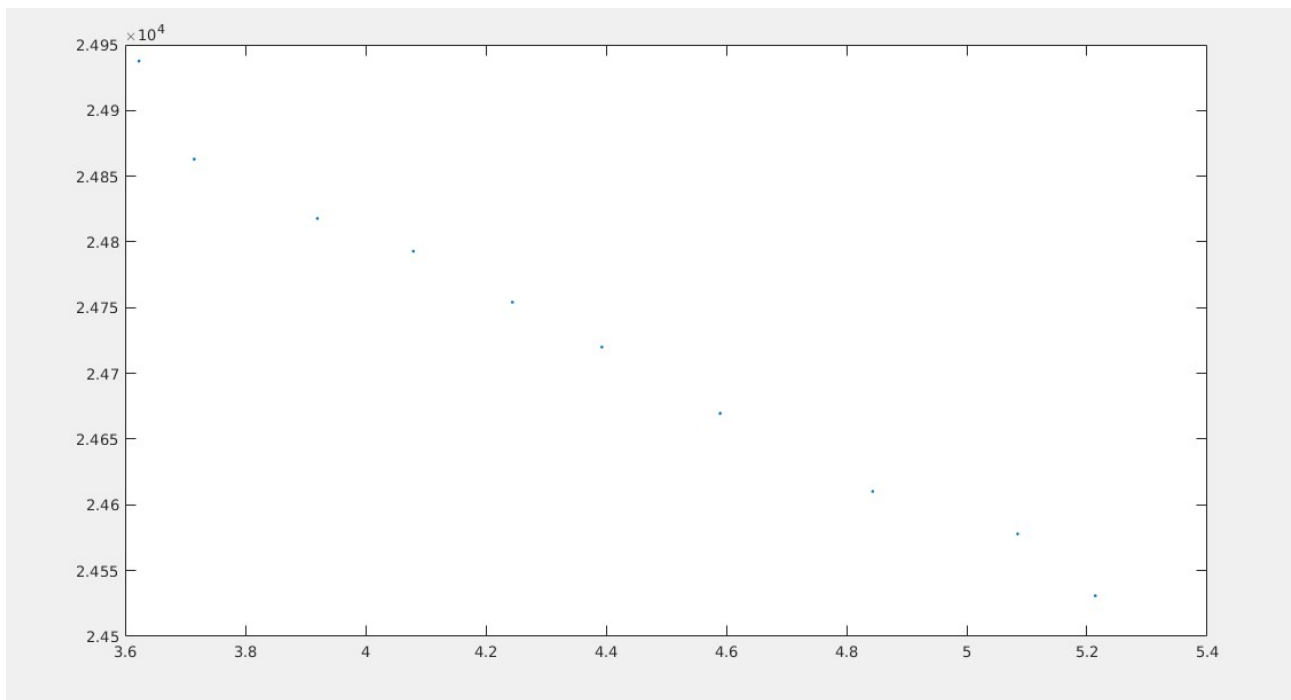
because of lossy compression. the block has lesser color variation the original image as can be seen clearly in images

3. Since the quantisation matrix weights increases at the bottom.



We notice dots whenever there is a difference in color. On dequantization followed by iDCT, we will get tge original image back.

5.



The plot shows higher entripty initially, which gradually reduces with c s increase.. and increase in rmse

4.



c=9



c=8



c=7



c=6



c=4



c=3





rmseerror =

1.0e+04 *

2.4531 2.4578 2.4610 2.4670 2.4720 2.4754 2.4793 2.4818 2.4863 2.4938

entro =

5.2137 5.0846 4.8435 4.5899 4.3931 4.2442 4.0795 3.9199 3.7150 3.6232

read for individual figure from left to right.

The highest value of c so that the distortions of the reconstructed image are just perceptible is $c=4$. Secondly, for $c=10$, image has lost a lot details, and looks just as a paint.