Image Compression Project Report

Participants	
Created By	
Type	Ad Hoc
Created	@November 29, 2022 9:25 AM
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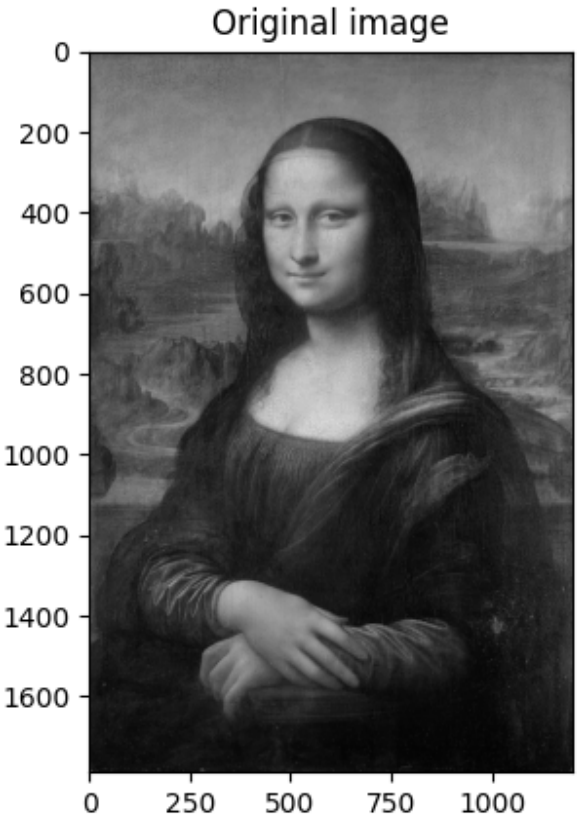
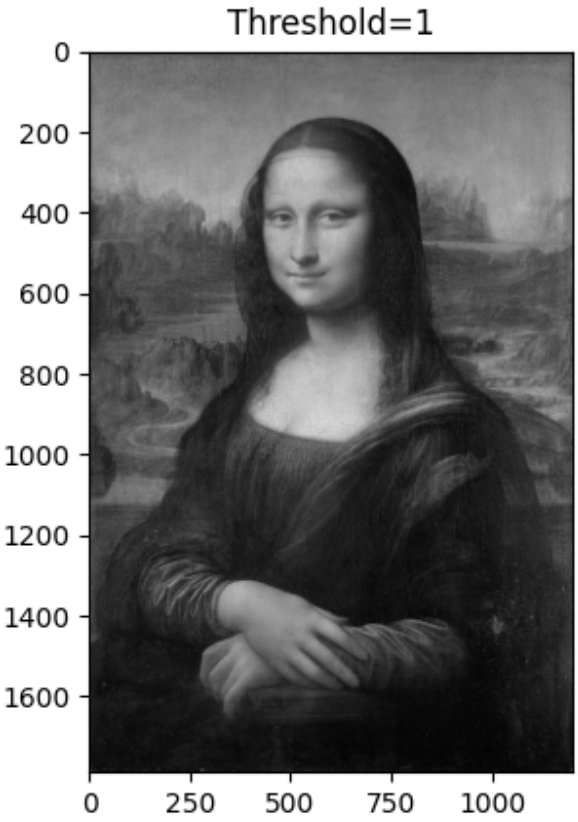
Goal

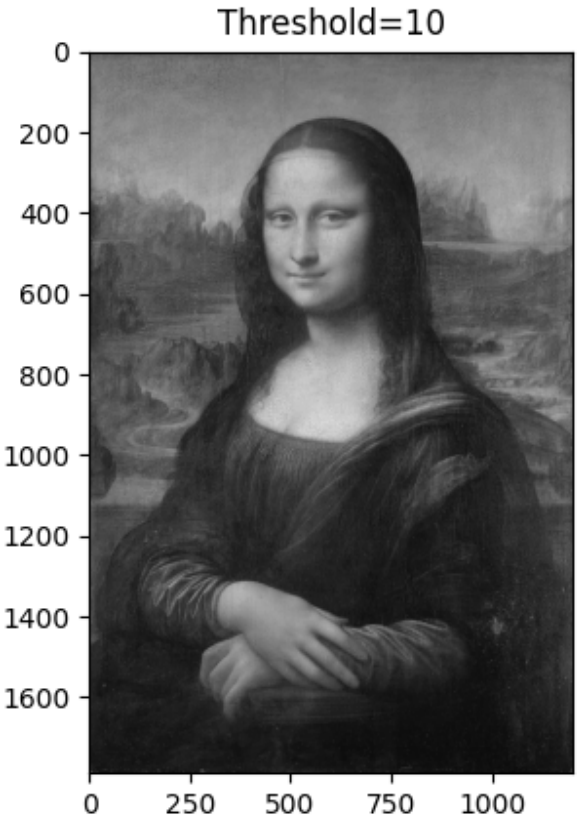
- To achieve Image compression (JPEG) using DFT

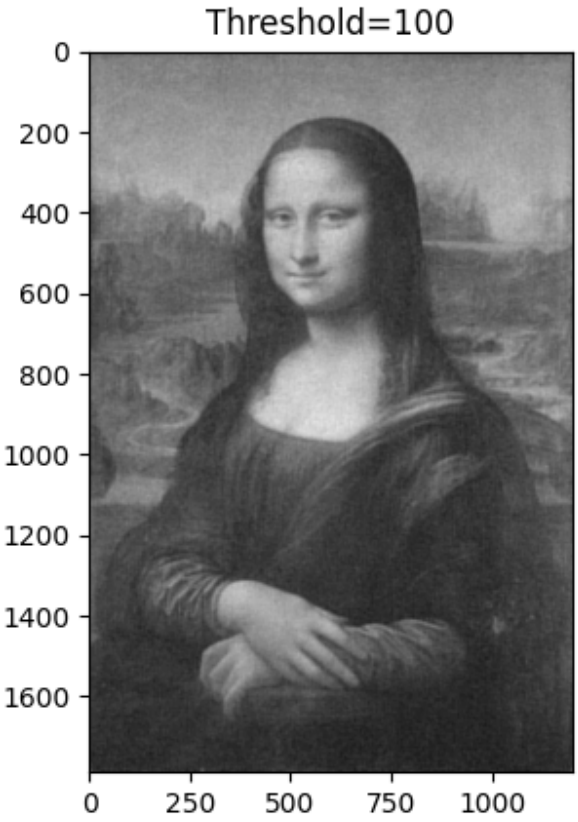
Images

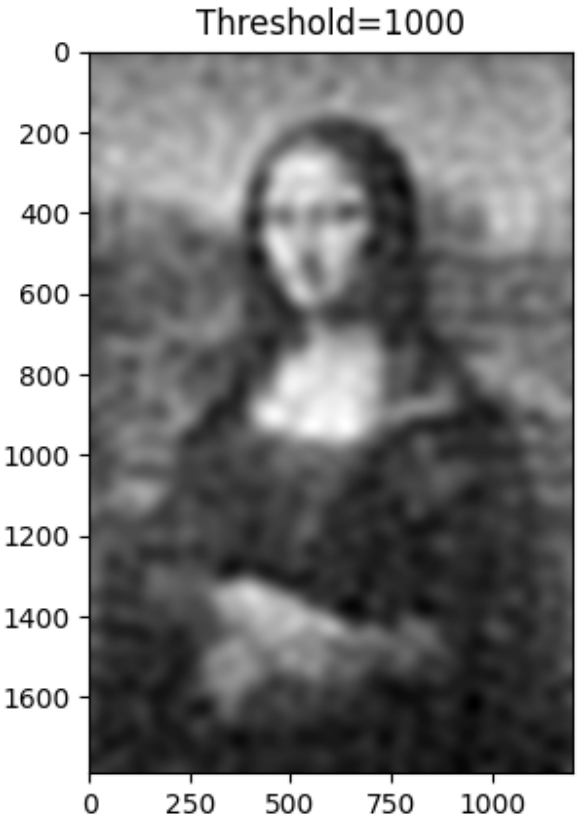
For different threshold values:

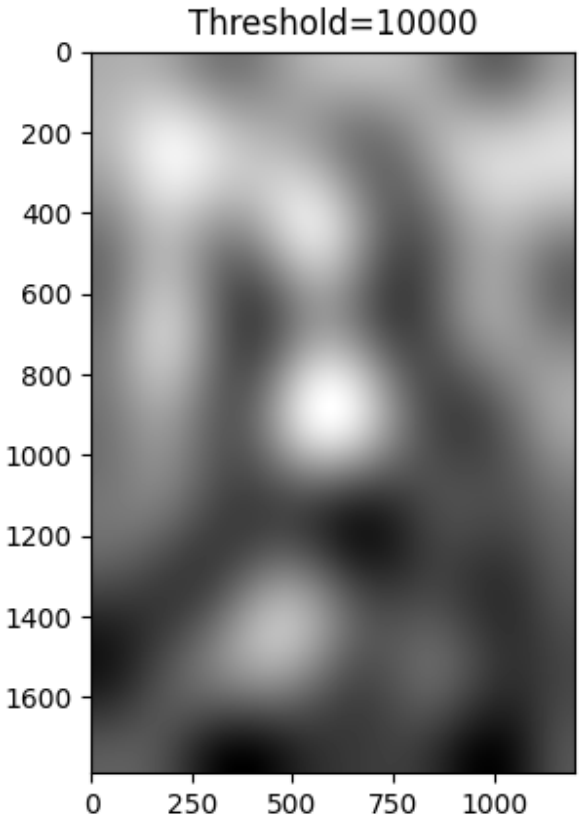

Original image
0
200
400
600
800
1000
1200
1400
1600
0
250
500
750
1000


Threshold=1
0
200
400
600
800
1000
1200
1400
1600
0
250
500
750
1000


Threshold=10
0
200
400
600
800
1000
1200
1400
1600
0
250
500
750
1000


Threshold=100
0
200
400
600
800
1000
1200
1400
1600
0
250
500
750
1000


Threshold=1000
0
200
400
600
800
1000
1200
1400
1600
0
250
500
750
1000



Inference

- Our method is a little different from the standard JPEG compression in the sense that we round off and consider values of DCT coefficients for integer multiples of threshold only.
- Finally, we managed to compress a “Mona Lisa” image whose original size was 853892 bytes using DCT into a “Compressed Mona Lisa” image whose size is 103515 bytes. The threshold was 8 in this case.
- Even though we eliminated almost 7/8th of the data, we found almost no difference in the image quality between the original and the compressed versions, except the original image had more contrast areas.
- We then compared this result to different thresholds like 10, 100,1000,10000,100000,1000000 and found that the compression and we created

a variable named “thresh” that can be manipulated to achieve desired compression to image quality ratio/tradeoff.

- We optimized the threshold variable to achieve maximum size compression with minimal human perceivable loss in image quality, and that value came out to be 8.0.
- On threshold value=1000, we start to see significant distortions.
- On threshold value 1000000, we get a black image, signifying that all coefficients were floored to zero