DFT Assignment: Q4

November 15, 2020

1 Observations

1.1 Ideal Low Pass Filter

1.1.1 $D = 40$

- Ringing is present in the final filtered image.
- The image is blurred due to absence of significant higher frequency components from the image.

1.1.2 $D = 80$

- Ringing is present in the final filtered image but it is much less as compared to the D=40 case.
- The image is much less blurred as the significant higher frequency components absent in D=40 case are now preserved in the image.

1.2 Gaussian Low Pass Filter

1.2.1 $\sigma = 40$

- Ringing can not be seen in the filtered image.
- The image is blurred but the necessary frequency components have been preserved so the amount of blurring is apt.

1.2.2 $\sigma = 80$

- Ringing can not be seen in the filtered image.
- The image appears to be much sharper than the $\sigma = 40$ case as more higher frequency components are preserved.

2 Image Outputs

2.1 Ideal Low Pass Filter

2.1.1 $D = 40$

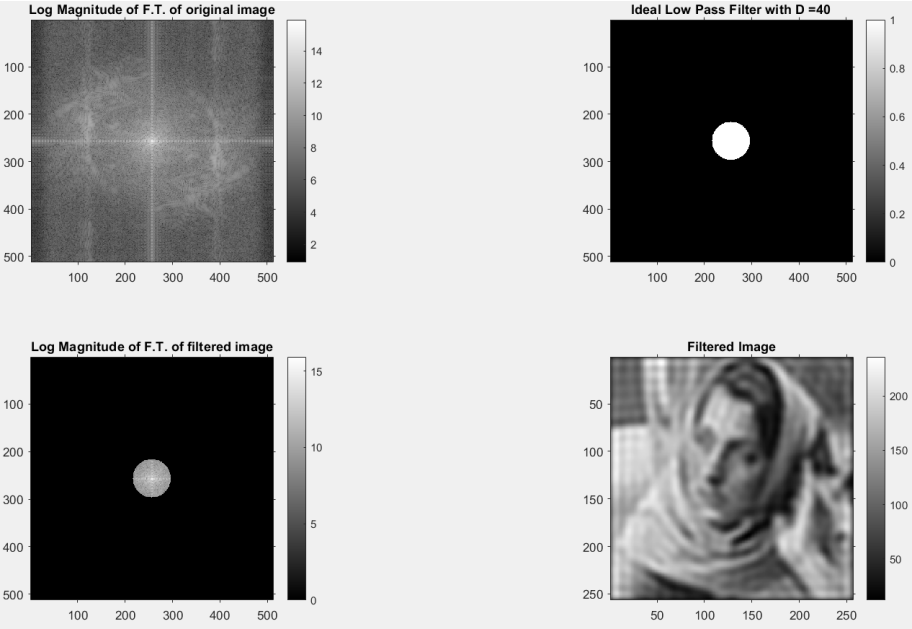

Figure 1: Ideal LPF Output when $D = 40$

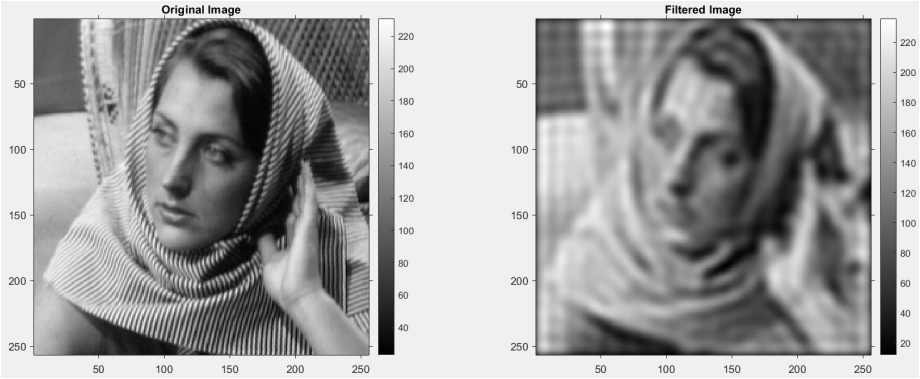

Figure 2: Comparison with original

2.1.2 $D = 80$

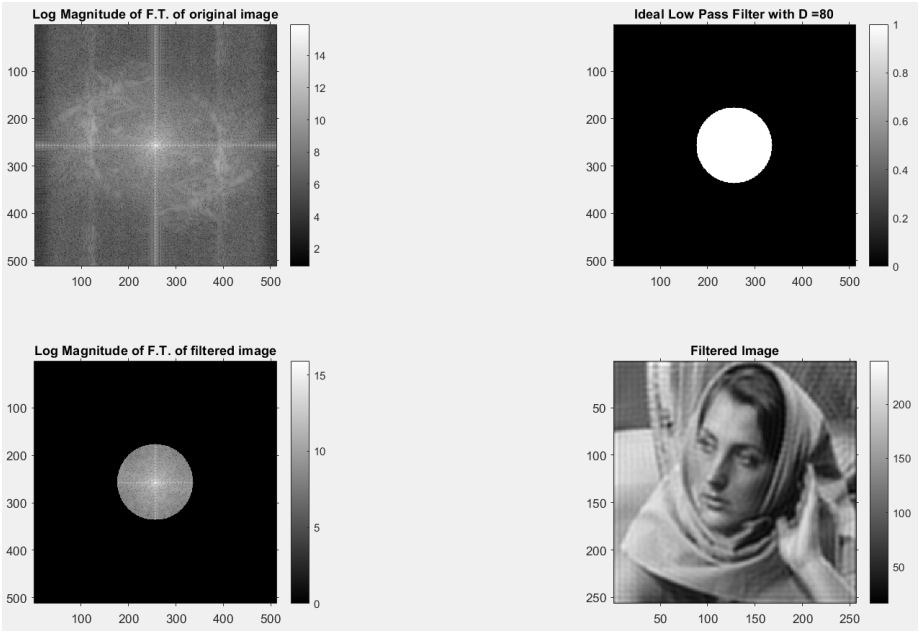

Figure 3: Ideal LPF Output when $D = 80$

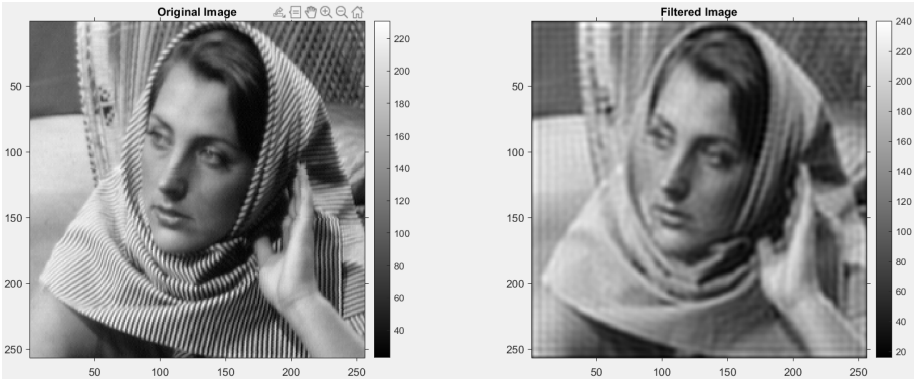

Figure 4: Comparison with original

2.2 Gaussian Low Pass Filter

2.2.1 $\sigma = 40$

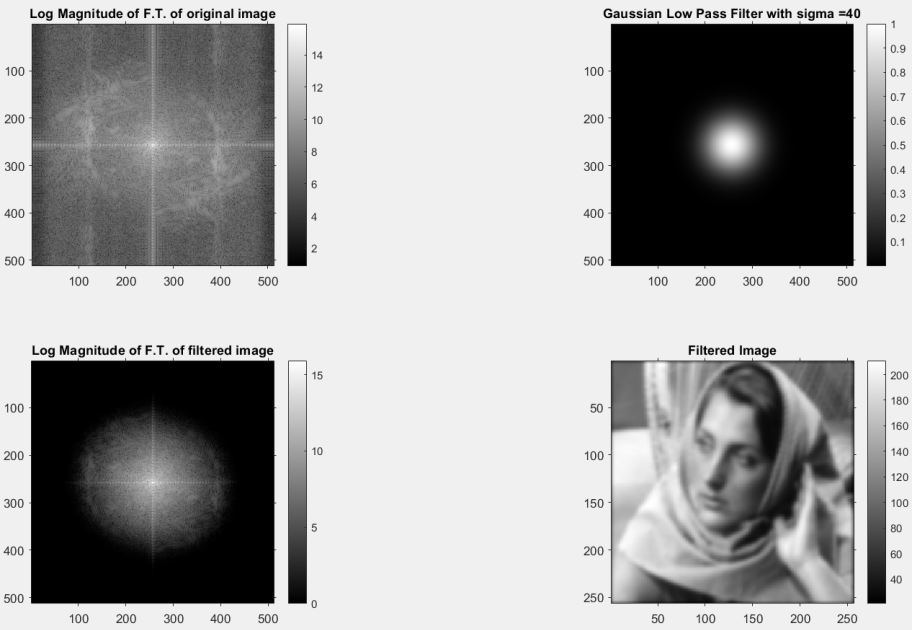

Figure 5: Gaussian LPF Output when $\sigma = 40$

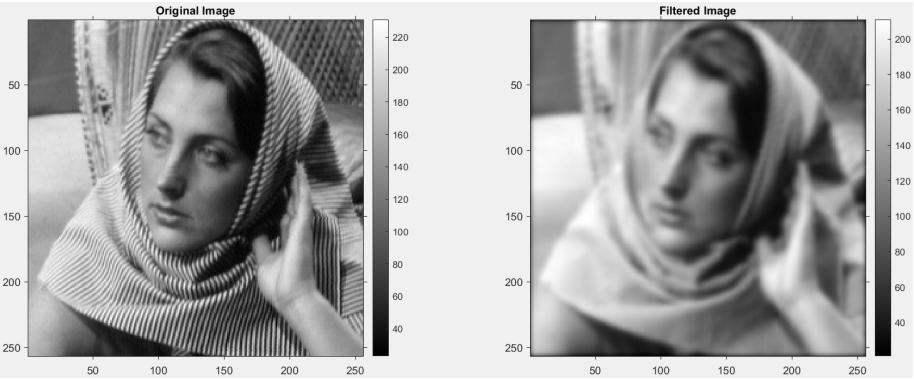

Figure 6: Comparison with original

2.2.2 $\sigma = 80$

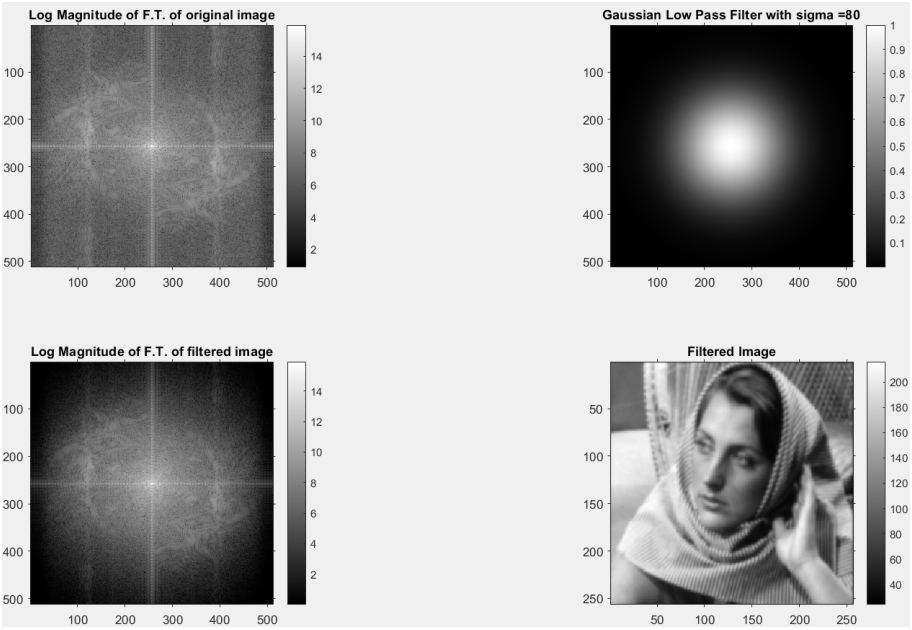

Figure 7: Gaussian LPF Output when $\sigma = 80$

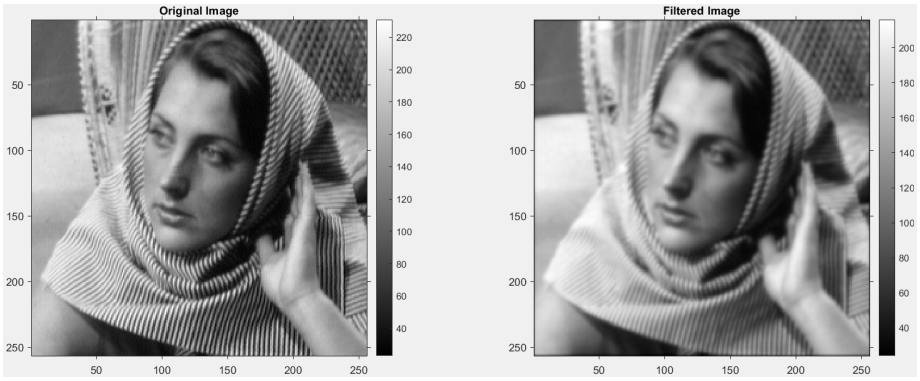

Figure 8: Comparison with original