Method	Jacobi	Gauss-Seidel	SOR	Conjugate Gradient
CPU time	0.677497	0.632951	0.038075	0.033445
Total number of iterations	150946	101060	2537	1484

Table 5-1: Image size 16X16 with SOR ran with optimal omega

Method	Jacobi	Gauss-Seidel	SOR	Conjugate Gradient
CPU time	1.897991	1.311630	0.152513	0.171098
Total number of iterations	144813	67322	3721	3733

Table 5-2: Image size 32X32 with SOR ran with optimal omega

Method	Jacobi	Gauss-Seidel	SOR	Conjugate Gradient
CPU time	7.095674	2.96529	1.063965	1.768527
Total number of iterations	126452	30240	4241	7642

Table 5-3: Image size 64X64 with SOR ran with optimal omega

Finding optimal omega values:

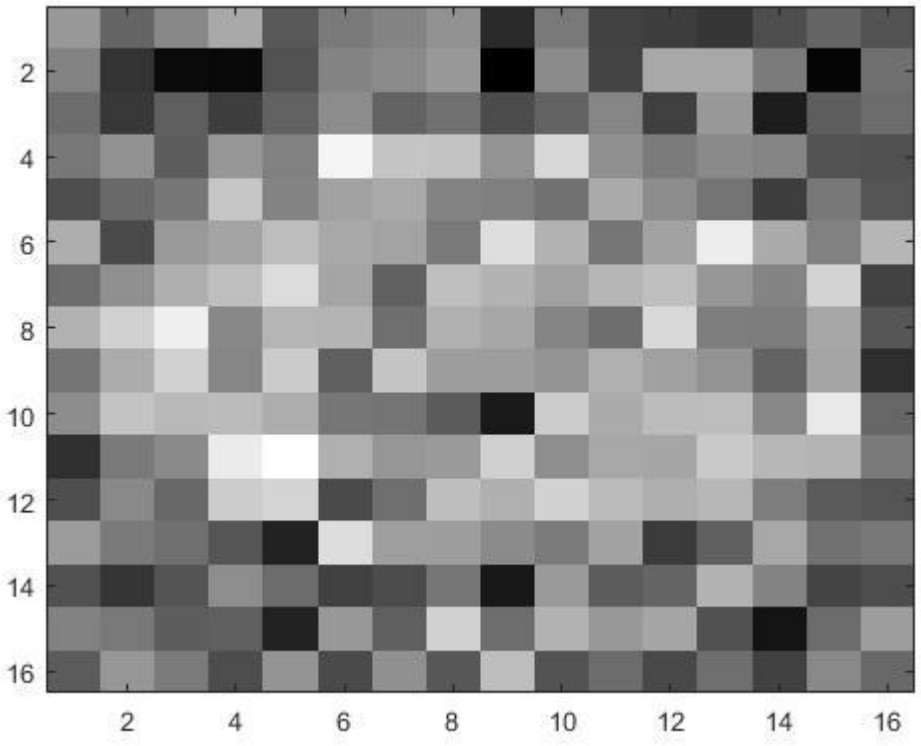
The range explored for finding optimal omega values were:

Image Size	Range	Value Selected
16X16	1:0.005:2	1.97 with 2537 iterations
32X32	1:0.005:2	1.98 with 3721 iterations
64X64	1:0.005:2	1.98 with 4241 iterations

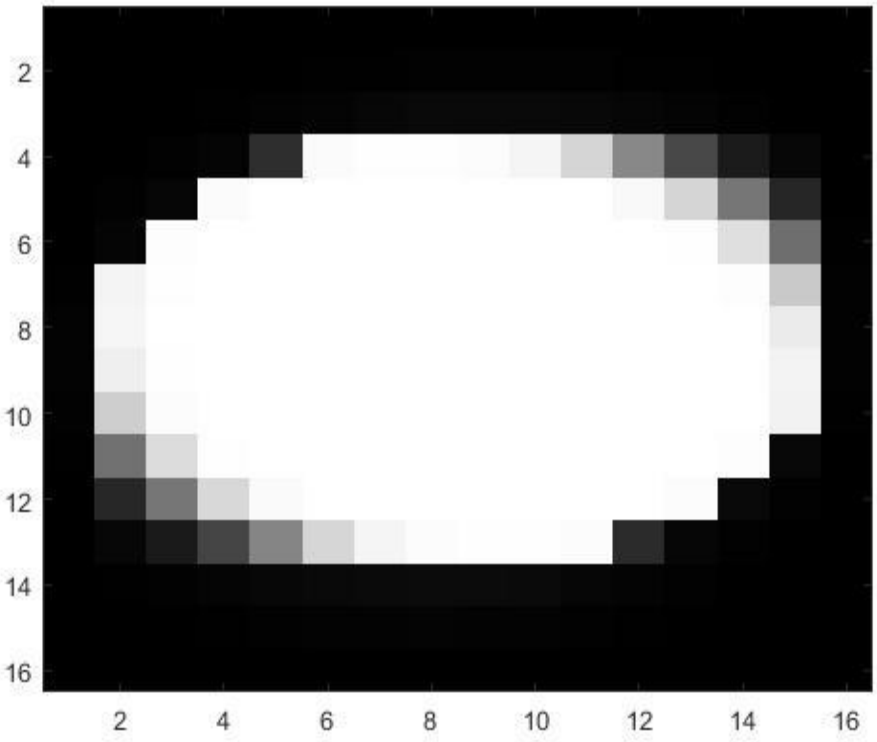
Denoised images

16 X 16

Noisy image:

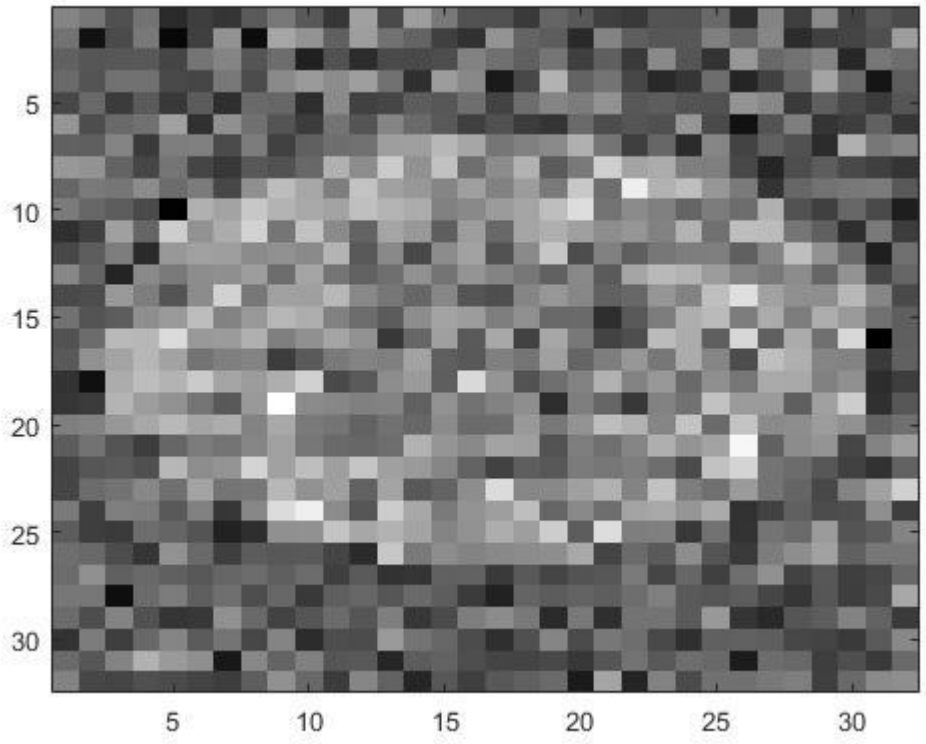


Denoised image:

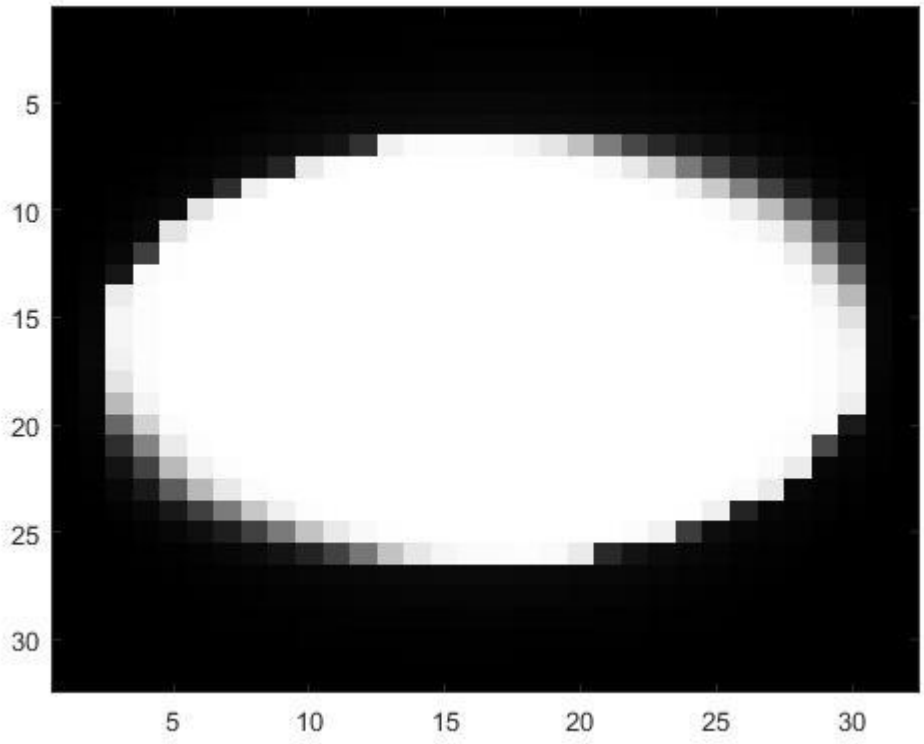


32X32

Noisy image:

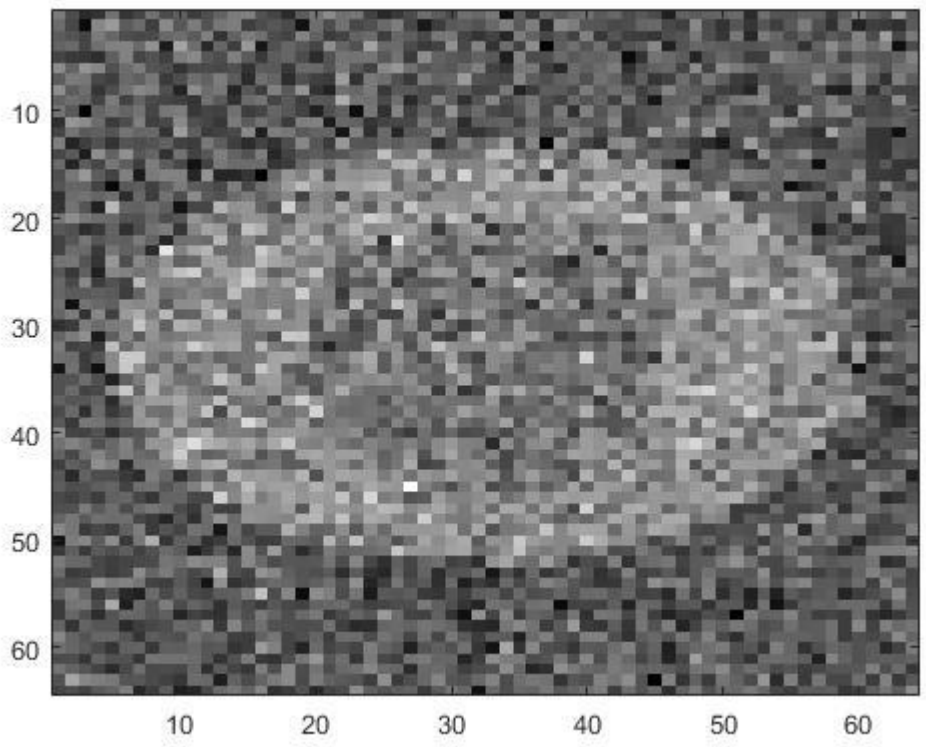


Denoised Image:

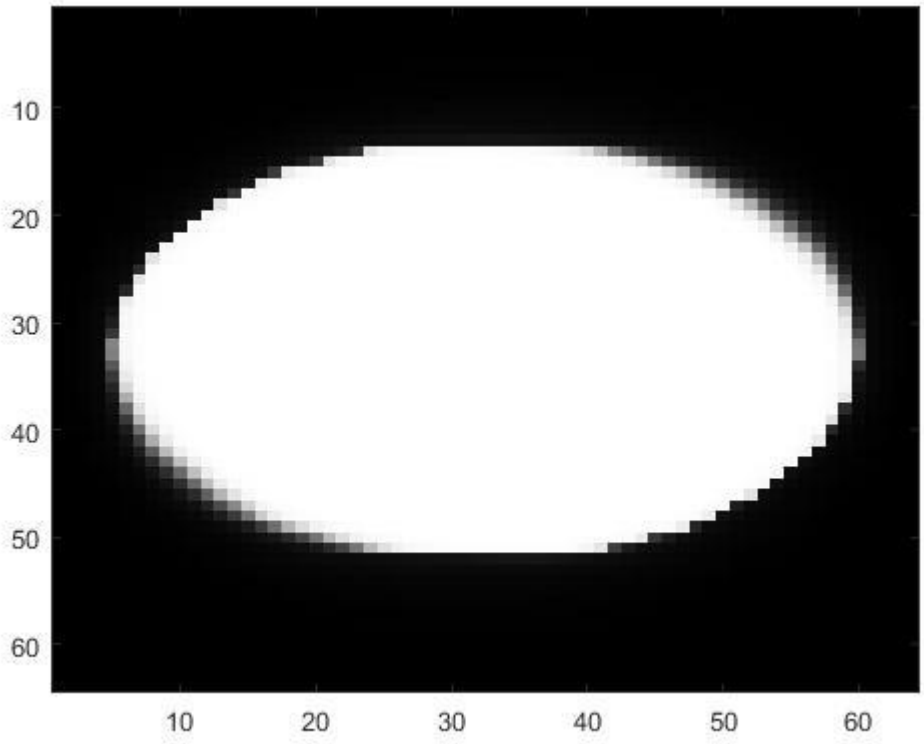


64X64

Noisy image:



Denoised Image:



Comments:

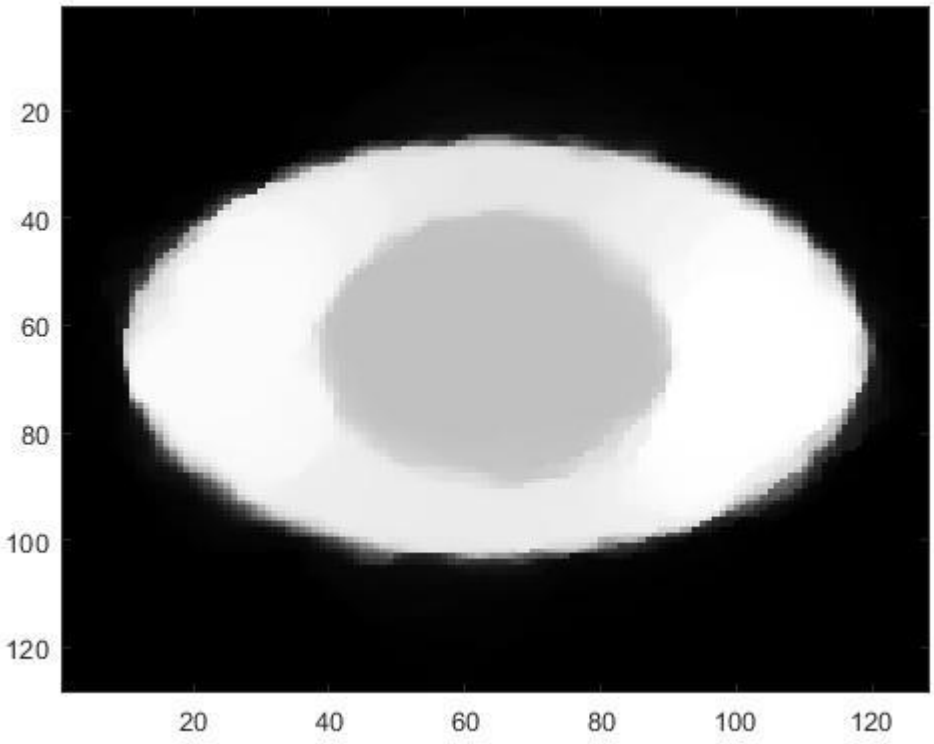
For a 16X16 image, Jacobi method takes the most amount of iterations then GS, SOR and the least is by the CG method.

For a 32X32 and 64X64 image, we observe Jacobi < GS < CG < SOR in terms of iterations.

In terms of CPU time, SOR performed best for larger size images while Jacobi performs the worst. SOR also performs lesser iterations than GS as expected since it is based on the omega tuning parameter and similar to GS.

128X128

Denoised image:


20
40
60
80
100
120
20
40
60
80
100
120