Exercise 1

The solution to the first exercise is given by the following image. We see that in the equalized

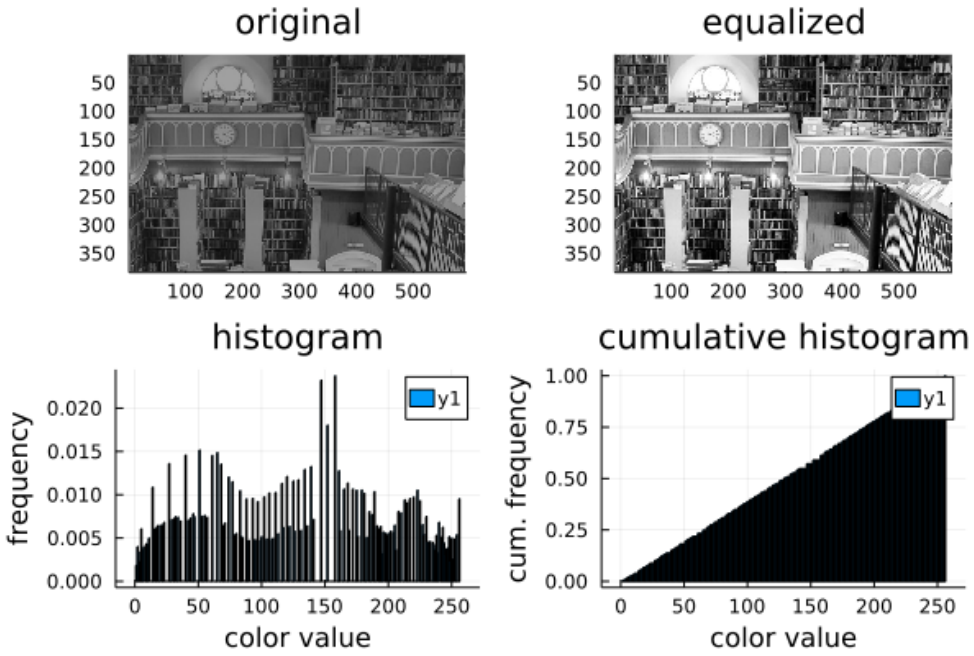


image the histogram is now fully spread out until the max value of 255. Furthermore we see that the contrast is higher.

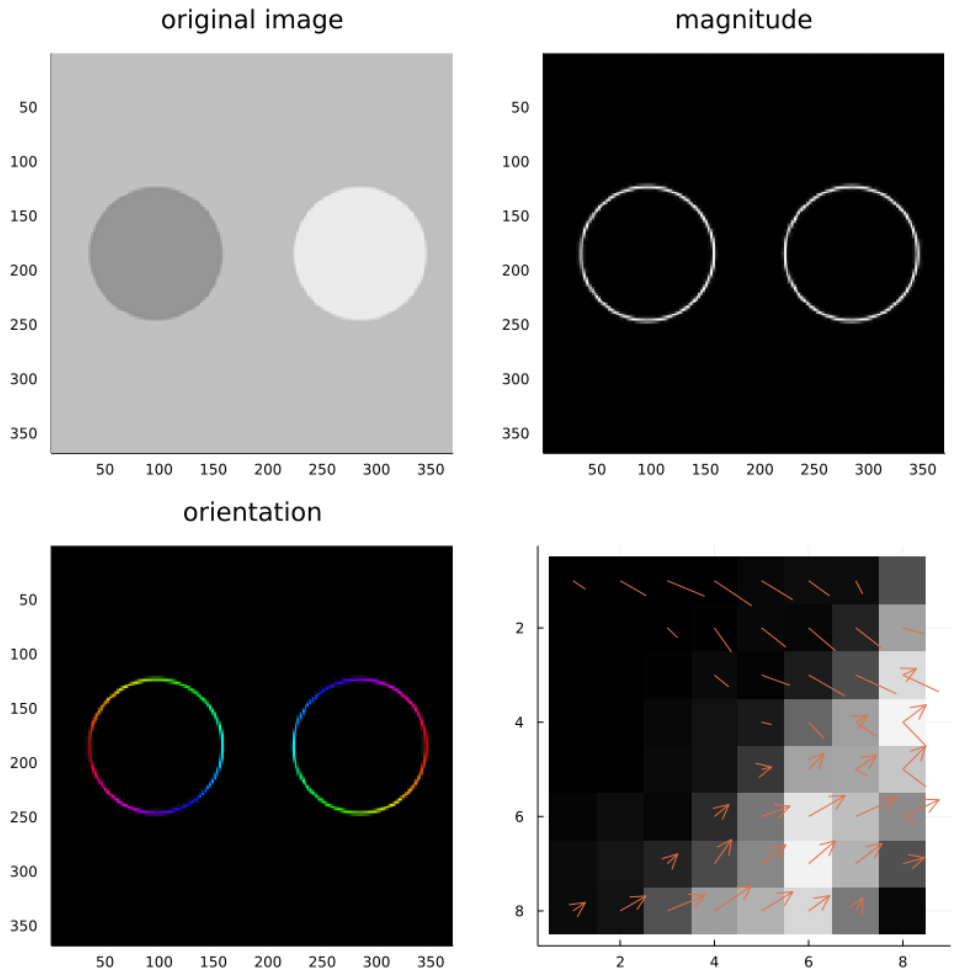
Exercise 2

The solution to exercise 2 is given by the following table.

v_i	(I_x, I_y)	$\|\|\nabla I(v_i)\|\|$	θ_i
v_1	$(-255, 255)$	360.624	$\frac{3}{4}\pi$
v_2	$(765, 255)$	806.381	0.322
v_3	$(-255, -295)$	360.624	$-\frac{3}{4}\pi$
v_4	$(-255, -765)$	806.381	-1.893
v_5	$(-1024, 0)$	1024	π
v_6	$(765, -765)$	1081.873	$-\frac{1}{4}\pi$

Exercise 3

The solution for the exercise 3 are given by the following. We see that the gradients get correctly identified, as well as the rotation.


original image
magnitude
orientation
50
100
150
200
250
300
350
2
4
6
8