HW 3 (100 points total, due 09:10, 11/15/21)

Problem 1 (50 points)

−1	−2	−1
0	0	0
1	2	1

Follow the steps outlined in Section 4.7 to repeat the experiment described in Example 4.15, pp. 271-273, of the textbook
for the horizontal Sobel kernel shown on the right. You may use any existing library to compute Fourier transform.

(a) Show the Fourier spectrum of the test image "keyboard" specified for this homework.
(b) Enforce odd symmetry on the kernel.
(c) Show the result of frequency-domain filtering of the test image using the horizontal Sobel kernel.
(d) Compare your result in (c) with the result of space-domain filtering.
(e) Show the result of frequency-domain filtering of the test image using the horizontal Sobel kernel without enforcing odd symmetry on the kernel.

Problem 2 (50 points)

Perform the experiments described in Example 4.24 for the test image "newspaper" and Example 4.25 for the text image "cassini." The grading will be based on the quality of your results.