CNN example

In the context of a Convolutional Neural Network (CNN) for image classification, consider an image with a size of 6x6 pixels, a filter of 3x3 and a pooling box of 2x2 dimensions has been provided below.

6	0	2	1	-5	0
-7	-2	0	5	1	-4
0	3	2	-1	0	7
5	1	0	-9	1	6
-4	1	2	0	3	5
-5	2	4	4	1	0

Image

1	0	-5
0	9	0
7	0	2

Kernel / Filter

a) **Calculate** the **output/feature map matrix** after doing one convolution operation using the above kernel on the image. Show all necessary steps to create the map. **[6]**

b) **What** will be the final feature matrix after using average pooling on the convolution matrix calculated in question (b). **[2]**