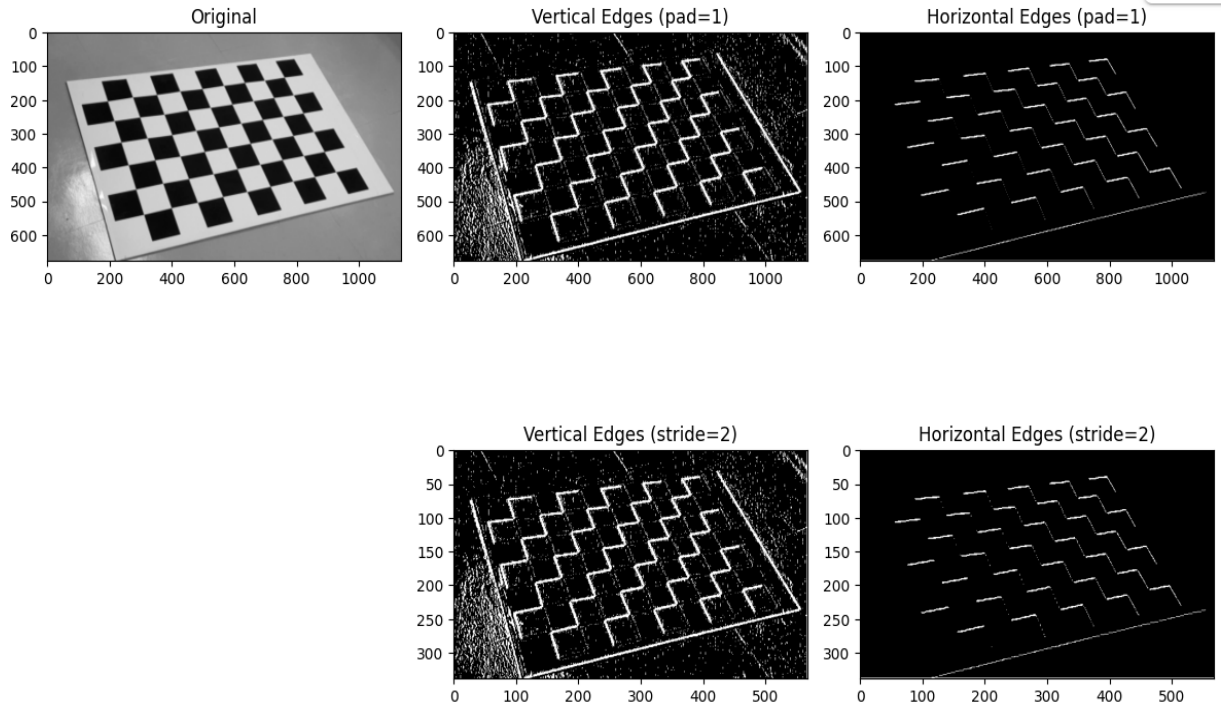
LAB5_inclass

results:



QA:

(5%) What types of patterns are detected by the vertical edge filter in an image? How is this different from the horizontal edge filter?

Vertical edge filters (such as the Sobel vertical kernel) are mainly used to detect brightness changes in the vertical direction of an image, that is, areas with drastic changes from left to right.

It can emphasize the left and right boundaries of objects or vertical lines (such as the edges of buildings, window frames, and columns).

The filter differs the image horizontally, examining the changes between each column of pixels.

The horizontal edge filter detects horizontal brightness changes, that is, areas with sharp differences between top and bottom.

It can emphasize the upper and lower boundaries of objects or horizontal lines (such as the horizon, the edge of the roof, and the edge of the table).

(5%) What is the effect of padding on the output image when applying convolution? Why is padding used?

Padding refers to adding extra zero values (or other values) around the original image to expand the image boundaries.

Effect:
Without padding, the output image after convolution will become smaller because the edge pixels cannot be completely covered by the kernel. Adding padding can keep the output size unchanged (or change it less).

Fringe information will not disappear:
Without padding, features at the edge of the image will be ignored during the convolution process. Using padding allows the convolution operation to also process the edge area and retain more image information.

Why use padding?
1.Avoid spatial loss (especially in deep CNN models)

2.Preserve image edge information

3.Make the output the same size as the input (important in some applications, such as classification models)