Sharpening (edge enhancement)

An edge is an extended, significant, local change in image intensity.
- is often presented as the converse of smoothing: smoothing is intended to reduce the effect of significant local variations in the image data whilst sharpening will exaggerate them.

Significant difference = if 2 monochrome pixels differ by 5 brightness values and their average was 5, this would be significant - not if their average was 150

Local change = a difference between two adjacent pixels will be of a greater significance than the same difference between two pixels separated by the image width

Roberts operator
(2 x 2)
- require the image to be convolved with two templates. This resulted in 2 images with orthogonal edges enhanced (one with **vertical** edges, the other one with **horizontal** edges) Then these 2 images are combined.
- simple, but susceptible to noise => to counter this problem, add smoothing

Prewitt and Sobel
(3 x 3)
- only differ in the weightings used in computing averages
- less sensitive to noise, less sensitive to small fluctuations in data

Canny operator
- edge enhancement algorithm
- convolve image with Difference of Gaussian.