**SE4050 – DL**

**Lab 03**

The result of convolving the signal [1, 1, 1, 1, 1, 1, 1, 0.5, 0.5, 0.5, 1, 1, 1] with the filter [-1, 1] is [0., 0., 0., 0., 0., 0., 0.5, 0., 0., -0.5, 0., 0.]. Each pixel has a brightness value. If the brightness values of the pixels change suddenly, then there is an edge in the image. The signal changes from 1 to 0.5 and 0.5 to 1. This change in brightness is detected by the filter, and the output array shows a value of 0.5 and -0.5 at this location. This is how we use filters to identify the edges in an image. In summary, by performing 1D convolution with an appropriate edge-detection filter like [−1, 1], you can effectively identify edges in an image. The places where the new numbers are big (positive or negative), those are the spots where there are likely to be edges in the image. This help find the parts of the image where things change quickly from bright to not-so-bright, which usually indicates edges. It's like a simple way to see where the image suddenly changes from bright to not-so-bright or the other way around.