

# Assignment 1

1. (a) Design a Gaussian filter kernel of size 9x9 and standard deviations of 1, 3, and 20. Report their values in a matrix form (format of values x.xxxex, for eg: 1.234e-05). [1 mark]  
(b) Perform Gaussian filtering on an image with the kernel designed in part 1(a) and compare the results obtained using different standard deviations on the same image. [3 marks]
2. (a) Design a DoG (Difference of Gaussians) filter of size 11x11 and standard deviations of your choice. Report the kernel values in a matrix form. [1 mark]  
(b) Perform filtering on an image using DoG filter designed in part 2(a). Use the grayscale image as the input. [1 mark]  
(c) Detect zero crossings and generate a binary image highlighting the zero crossings on the DoG-filtered image. [2 marks]

Note: No inbuilt functions are allowed except for image read, write, save. You can use either MATLAB or Python for this assignment. You can use the attached images as the input images.