Assignment 2

March 30, 2021

Q.1.

(a) Image (b) Ground Truth

Figure 1: Sample image and its ground truth

Consider the Figure 1(a). Write a Python/Matlab code to find the segmented image using (a) Region Growing algorithm, (b) Watershed algorithm and (c) K-means algorithm. The ground truth of the image is provided in Figure 1(b) for your reference.
Also comment on which algorithm performs better and the inference. Use a evaluation metric like Jaccard similarity coefficient for comparing.
Share the notebook script with the output segmented images for each method. Also, leave a comment for each line of code explaining it. Those who want to implement on Matlab, send a zip folder containing the required codes and outputs.

Q.2. Let $h(x, y) = exp(-\frac{x^2+y^2}{2\sigma^2})$. Determine the expression for Wiener filter, assuming that the ratio of power spectra of the noise and undegraded signal is a constant.

Q.3. An image patch is given below. Calculate the Local Binary Pattern (LBP) and the Local Derivative Pattern (LDP) for four neighbours i.e $0°, 45°, 90°$ and $135°$ of reference pixel(which is given in bold).

2	5	3	5	1
6	7	9	1	5
2	3	**4**	8	2
3	2	3	2	9
1	2	3	2	1