Artificial Intelligence
Image Processing

Before proceeding with assignments, please visit scikit-learn web page (https://scikit-learn.org/stable/getting_started.html and read about image processing in python.

1. Perform OR, XOR and AND operation for a pair of images, where one is monochromatic and the second is colored. You should duplicate gray-levels of the monochromatic image to all R, G and B channels. You can use images of your choice.
2. Using images from the webpage your assignment is to write an artificial intelligence system that will be able to detect if objects in the images were moved. You should implement both subtraction and division of the images.
3. Using images form the webpage write a program the calculates the following distance between all objects in the images:
   (a) Euclidian distance
   (b) City-block distance
   (c) Chebyshev distance
4. Write a program that calculates the number of objects in the image. Check the difference for 4-connected and 8-connected neighborhood.
5. Write a program the will use appropriate image filtering techniques to remove noise from the provided images.
6. Write a program that will perform the following morphological operations:
   (a) dilation
   (b) erosion
   (c) opening
   (d) closing

You can write one python program that will include all the problems or separate programs for each. If you prefer to use Jupiter notebook, you should create only one notebook with appropriate formatting and explanations to make a clear distinction between problems.