

Implement adaptive thresholding on the image attached. Let  $m_{xy}$  and  $\sigma_{xy}$  denote the mean and standard deviation of the set of pixel values in a neighborhood,  $S_{xy}$ , centered at coordinates  $(x, y)$  in an image. The following two quantities are computed for every such neighborhood

$$T_{xy} = a\sigma_{xy} + bm_{xy}$$

$$T'_{xy} = a\sigma_{xy} + bm_G$$

Where  $m_G$  is the average intensity value of the entire image. The final output image is computed as follows:

$$g(x, y) = \begin{cases} 1 & \text{if } f(x, y) > T_{xy} \\ 0 & \text{if } f(x, y) \leq T'_{xy} \end{cases}$$

where  $f(x, y)$  is the input image. This equation is evaluated for all pixel locations in the image, and a different threshold is computed at each location  $(x, y)$  using the pixels in the neighborhood  $S_{xy}$ .

Please note that in Matlab, you can compute the standard deviation of a matrix using `std()` function and you can also compute the mean using `mean()` function.