

# Histogram Equalization: Algorithm

1. Compute the image histogram (`np.histogram`)
2. Compute the cumulative histogram (`np.cumsum`)
3. Normalize the cumulative histogram (divide by the total number of pixels)
4. Multiply the normalized histogram by the maximal gray level value ( $K-1$ )
5. Verify that the minimal value is 0 and that the maximal is  $K-1$ , otherwise stretch the result linearly in the range  $[0, K-1]$ .
6. Round the values to get integers
7. Map the intensity values of the image using the result of step 5.

cumulative histogram  $C(k)$

Let  $m$  be first grey level for which  $S(m) \neq 0$

$$T(k) = \text{round}\{ [C(k) - C(m)] / [C(255) - C(m)] \times 255 \}$$