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| **Noms:** |  |
|  |
| **Lloc treball:** |  |
| **Grup:** |  |

1. Interpret the histogram of the image **x**. Are all gray levels used equally? What image gray levels are missing in the original image **x**?
2. Looking at the histogram, what is the probability of a pixel of the image **x** having a gray value of 32? And 200?
3. From the equalized histogram, what is now the probability of a pixel of the equalized image **y** having a gray value of 32? And 200?

1. Are all gray levels used equally in the equalized image? Why doesn’t the histogram equalization accomplish a completely flat histogram?

1. From the gray level transformation, what has happened to gray levels between 100 and 250 in the original image **x**?
2. Looking at the histogram of the original image **x** in figure 3.2 and the gray-level transformation in figure 3.5, calculate again the probability of pixels with gray value 32 and 200 of the equalized image **y** (you have already got this result in your answer to question3).
3. Has the contrast of the equalized image increased with respect to the low contrast version? Are the colors of the original image preserved? Why are colors changed in the equalized image?
4. In the case of using only the luminance component to equalize the image, has the contrast of the equalized image increased with respect to the low contrast version? Do you think colors are better preserved in this case than equalizing all RGB channels?
5. Interpret the magnitude of the DFT of the image. Why are two important frequency responses appearing? Where (i.e.., coordinates k and l) are they appearing in the frequency plane, why?
6. Interpret the magnitude of the DFT of the image. Important frequency components can be observed in the magnitude representation around coordinates (135, 73) and (43, 73). Compute the discrete frequencies corresponding to these components. What do they represent in the image? Can you demonstrate your answer by measuring the periodicity of some feature in the original image?
7. Could you find in the DFT shown in Fig. 3.18 the frequency components introduced by the granular pattern? (Hint: compare this DFT with the DFT of the pattern r[m,n] of the previous study).
8. Has the granular pattern been eliminated? Why? Has the average level of gray been changed in the image? Why?