LOGARITHM OF AN IMAGE

- The application of the logarithm to the gray levels results in a contrast enhancement in the area of low gray levels, or dark areas, at the expense of a contrast reduction in brighter areas.
- The general formula is as follows:

$$g(x,y)=K*\log_{10}[1+f(x,y)]$$

where the '1' inside the bracket ensures that the minimum level of output gray starts from zero. K is a constant that sets the maximum output level, ensuring that the maximum luminance is limited (normally to 255).

- The value of K is selected so that the maximum luminance value at the input, $máx\{L_{entrada}\}$, corresponds to $L_{máx}$ at the output (usually $L_{máx}$=255):

$$K = \frac{L_{máx}}{\log_{10}(1+máx(L_{ent}))} = \frac{255}{\log_{10}(1+máx(L_{ent}))}$$

for this, we should explore the original image pixel by pixel and find the pixel with greatest luminance.