TNM087 – Image Processing and Analysis
Lab 2 –Spatial Filtering

TASK 2 - MATLAB code for spatial filtering

Write a code that performs lowpass, highpass, bandreject, bandpass filtering as well as unsharp masking and highboost filtering, as specified in the given MATLAB template $myfilter.m$. As the input you have the original image and two lowpass kernels, with two different cut-off frequencies. **In order to avoid dark borders around the filtered results, use symmetric padding.** Notice that your code should be general and work for any input image and lowpass filters. Use the MATLAB template $myfilter.m$ and write your code in this file. Read the comments in this template and write your MATLAB commands after each instruction. This function is called as $myfilter(im, lp1, lp2)$, where im is the image being filtered and $lp1$ and $lp2$ are two lowpass filters. **IMPORTANT NOTICE:** As specified in the template $lp2$ is supposed to have a lower cut-off frequency than $lp1$. This is very important to be taken into account when you create the band reject filter.

Test your code on different images using different lowpass filters as input arguments. Specially, it is interesting to test your code on the image called *zoneplate.tif*. This image contains different frequencies and it is interesting to study how different filters pass some frequencies and block others. As the filter kernels, it is interesting to try different box and Gaussian filters. **Notice again:** when you call your function $myfilter(im, lp1, lp2)$, make sure that $lp2$ has a lower cut-off frequency than $lp1$ (see **Problem 3** in Task 1 (preparation) and ask the teachers if you are not sure about the answer).