BIL – 421 IMAGE PROCESSING
PROGRAMMING ASSIGNMENT # 2

Due Date: **April 30, 2014 till 23:59 pm**
Submission: **Moodle Upload**

Problem) SPATIAL FILTERING

a) Implement and apply Gaussian smoothing using a `2k*1 x 2k*1` kernel with a specified sigma (σ) [Ex: For *k*=12 the kernel would be 25x25]. The kernel coefficients must be computed using the formula given below. The user is asked to input σ and `k` values.

A sample 25 x 25 kernel

$H_{1,1}$	$H_{1,2}$	…	$H_{1,25}$
$H_{2,1}$	…	…	…
…	…	…	…
…	…	…	…
$H_{25,1}$	…	…	$H_{25,25}$

$$H_{ij} = \frac{1}{2\pi\sigma^2} \exp\left(-\frac{((i-k-1)^2 + (j-k-1)^2)}{2\sigma^2}\right)$$

b) Implement your own *Convolution* operation in spatial domain using the above kernel. Use the attached image (*IMG.tif*) to apply Gaussian smoothing. Explain how you handle the border problem as a comment in your source code.

NOTES:

1) Do not use any Matlab IP toolbox function such as conv2, fspecial or imfilter. Consult your lecturer for other functions to be used.
2) Give meaningful variable names.
3) Submit your source files (.m files) only. Do not submit your input / output files (images)