Student Name: .....

Student Number: .....

Project 3

Project 3: Morphological Filters & Spatial Filtering

A. What to DO:

1) Sharpen the edge of moon image (*moon.jpg)* by using the Laplace and Sobel filters. Input image has blur effect. We are expecting getting more sharper edges. Compare your results with each other.

2) For the grayscale fingerprint image (fingerprint.jpg), write a code to convert it to binary image using thresholding method. You may select the threshold value by checking its histogram. After converting it to binary image, apply morphological filters to clean the noises and remove the holes in the image as much as possible by using different size of structuring elements. Your report has to include the histogram plot and discussion about selected threshold value and size of structuring elements.

3) For *cell.jpg* image, write a code to count the total number of cells, calculate the size of each cell in pixels, and show the boundary of the biggest cell in an output image. In your code, you might use any techniques covered in this class. Hint: Thresholding, morphological filters, connected components, etc.

B. What to turn in:

- A zip file with all the necessary SOURCE code
- a written report (in pdf format) including the following contents.
    - Cover page with your name, class title, class number, date, etc.
    - Abstract (no more than 300 words) summarizing what this project is about (objective), what you did, and what you find out.
    - Result section that lists both the original image and the output image of the special effect. Make sure that there's caption to the figure and that parameter used that generate the result are elaborated in the caption.
    - Discussion section summarizing lessons learned, your experience working on the project, potential future work if given time, etc. Note that this should be a short paragraph, no more than 300 words.
    - Source code printout.
- Upload the zip file and project report to blackboard.

C. Due Date: It is announced on D2L.