

## CT248: Introduction to Modeling

### Assignment 3: Image Processing

Create the following plots, based on the input colour photograph of the Engineering Building. Use the MATLAB functions `imread()` and `imshow()` to read and display the photographs.

**Original Picture**



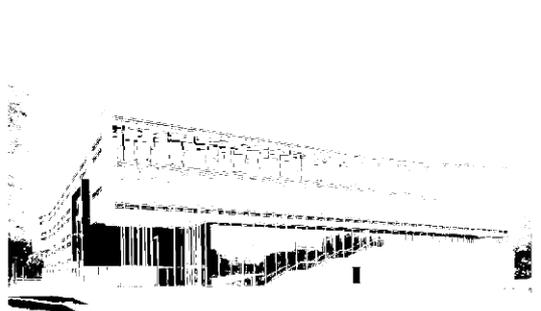
**Grayscale**



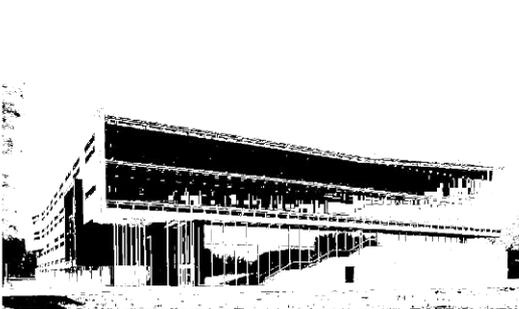
**Inverted Grayscale**



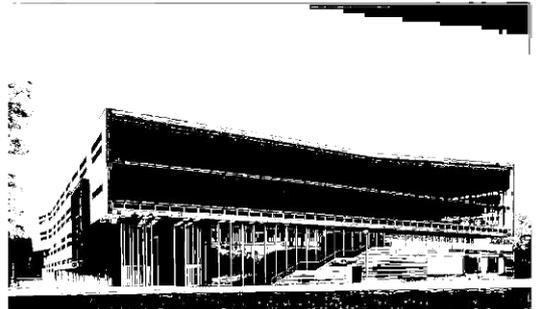
**Binary Threshold = 50**



**Binary Threshold = 75**



**Binary Threshold = 100**



The following script should be used (final 3x2 plot of pictures not shown and should be coded).

You must write the functions:

- **pic2grayscale()** which uses the NTSC Standard transformation to convert RGB to grayscale.
- **transform\_pic()** which converts a 255 colour code to 0, 254 to 1, etc, and 0 to 255. The relationship can be expressed as the equation of a line.
- **transform\_threshold()** which converts the picture to binary format where any value above the threshold is white (1), and all values equal to or below are black(0).

```
clear;
eng1 = imread("Engineering-Building.jpg");
eng1_gs = pic2grayscale(eng1);
eng1_gs_inv = transform_pic(eng1_gs);
eng1_gs_bin_50 = transform_threshold(eng1_gs,50);
eng1_gs_bin_75 = transform_threshold(eng1_gs,75);
eng1_gs_bin_100 = transform_threshold(eng1_gs,100);
```