CSE/ESE 565M Assignment #2

Due: Tuesday, Oct. 9, 2012.

1. Utilize the example code provided from the ROCCC distribution and choose two applications (one can be simple, make the second different in some way). Build the two applications from the C source to synthesis (no need to place and route), and assess the following:

   (a) What changes as you vary the input data set size (or some other interesting parameter of the design)? Area? Clock rate?
   (b) Simulate the design for an individual data set size (a small one is fine) and describe how a ROCCC module or system interfaces with its environment.

2. Author a ROCCC system that does a merge sort of two streams of input (key,tag) pairs. What is its performance (area, clock rate) for varying KEY_SIZE and TAG_SIZE?

3. Author a ROCCC image filter for an N by N image that filters using the algorithm below:

   if pixel$_{ij}$ < T$_{Hij}$
   retain pixel
   else
     if pixel$_{ij}$ < T$_{Lij}$ and neighbor of T$_{Hij}$ retained pixel
     retain pixel
     else
       discard pixel (set to 0)
   endif

   What is the area and clock rate of this design as a function of N? Include N = 40 in your investigation.