Homework #9 CS 1645/2045
Due: NOT DUE - FOR FINAL EXAM PREP Spring 2017

Question 1:
Assume we have a matrix with values.

0 0 4 0
0 2 0 0
0 0 0 3
2 0 0 0

a. Show the compressed sparse row format of this sparse matrix.

b. Show the steps necessary to multiply this matrix in this format by the vector <4,3,2,1> using the sparse matrix representation. Show the pseudocode for such an algorithm.

c. Compare the number of operations required using the sparse matrix to that required to do the traditional matrix-vector multiplication.

Question 2:
Fill in the calculated values at each step of the Blelloch exclusive scan for the following values.

	8	7	6	5	4	3	2	1
Step 1								
Step 2								
Step 3								
Step 4								
Step 5								
Step 6								
Final Scan								

Depending on how your write this you may use more or less steps. This is modeled after the walk thru found in the notes.

Repeat this for the Hillis/Steele algorithm.

Question 3:
Given the following bitonic sequence of numbers:
<3, 5, 6, 7, 9, 11, 14, 15, 13, 12, 10, 8, 4, 2, 1, 0 >

a. Show the steps to produce a sorted set of numbers. Be sure to show what comparisons you are doing the number of steps necessary.

Question 4:
Given the following set of numbers show how radix sort can be used to sort them, assume a 4 digit binary representation.

8
14
11
4
9
10
5
7

Make sure to show each step and note how many compact operations would be required if executing this on a GPU.