**CS 3853 Computer Architecture**

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**Due Date: Sep 14, 2017**

**Assignment -1**

**Amdahl's Law**

Use a graphing program such as Excel, LibreOffice, Matlab, R, or whatever you prefer so long as it looks good, to plot the following implications of Amdahl's Law.

1. Consider the speedup ((T\_1/T\_P)) where (P=256) of a program with sequential portion (S) where the portion (1-S) enjoys perfect linear speedup. Plot the speedup as (S) ranges from 0.01 (1% sequential) to 0.25 (25% sequential).
2. Consider again the speedup of a program with sequential portion (S) where the portion (1-S) enjoys perfect linear speedup. This time, hold (S) constant and vary the number of processors (P) from 2 to 64. On the same graph, show three curves, one each for (S=0.01), (S=0.1), and (S=0.25).
3. Consider the following program. We have a sequential program with T1 = 1000. The sequential portion is 250 and the portion that can be parallelized is 750.

* Based on Amdahl’s Law calculate TP and Speedup and Efficiency for P = 2, 10, 50, 100.
* How many processors should be used to achieve the minimum time possible. What is that time? Calculate Speedup & Efficiency for that number of processors.
* Discuss and explain the overall trend in performance as P increases (for this program) using Amdahl’s law calculations and perspective.