MCEN 6228/ASEN 6519 Spring 2011

Homework #3

Due April 22, 2011

Problem 1 Read and "summarize" the three papers listed below. All three are downloadable through the UCB online journal resources. Two of the summaries can be relatively short (1/2 - 1 page) but one should be chosen to go into more detail (2-4) pages. Note that "summarize" does not mean only regurgitating the introductions and summaries of the paper, rather it requires:

1. demonstration of understanding of the "interior" of the paper
2. discussion of extensions and/or alternate applications of the idea
3. discussion of limitations of the approach taken and alternative routes to accomplish the same objective (e.g., a critique of the paper).

For those that have not identified a class project, these papers have good potential topics that could be selected. For example, [1] has a fairly straight forward test problem that could be run on a few different machines (e.g,, Janus, laptop, etc.) and under various processor counts to extend the papers study to those platforms. There are also a couple of variants of [2] that are straight-forward (e.g., study cache performance in serial). The third paper, while interesting probably requires too much external software to be completed in the time remaining.

1) O. Sahni, C. Carothers, M.S. Shephard, K.E. Jansen., "Strong scaling analysis of a parallel, unstructured implicit solver and the influence of the operating system interference", Scientific Programming, 17, 3 (2009) 261-274.

2) M. Zhou, O. Sahni, M.S. Shephard, C.D. Carothers, K.E. Jansen, "Adjacency-based Data Ordering Algorithm for Acceleration of Parallel Finite Element Computations", Scientific Programming, 18, 2 (2010) 107-123.

3) M. Zhou, O. Sahni, K.D. Devine, M.S. Shephard and K.E. Jansen, "Controlling Unstructured Mesh Partitions for Massively Parallel Simulations", SIAM Journal on Scientific Computing, 32, 6 (2010) 3201-3227.