18-645/SP07: How to Write Fast Code
Assignment 5
Due Date: Fr Feb 29 6:00pm
http://www.ece.cmu.edu/~pueschel/teaching/18-645-CMU-spring08/course.html

Submit the homwork as pdf. Name your file '18645-assign5-userid.pdf' where 'userid' is your andrew user id. The .pdf file must include all plots and figures. Do not put the .pdf file in a zip or tar archive - attach it separately. Send it along with part 1b (see below) to <schellap+18645-assign5@andrew.cmu.edu>. *In addition to the electronic copy, you must also submit a print-out of your pdf to the TAs at PH-B10 or to Carol Patterson at PH-B15.*

This week we have a shorter homework. You should use the remaining time to start optimizing your research project implementation.

1. *(40 pts)* Read the provided paper (see link on course website) and write a 1/2–1 page summary (11 point font size). Your writeup should include answers to the following questions: a) what is the paper about? b) what are the main findings and conclusions? c) what does the paper add to what you learned in the lecture on optimizing sparse matrix-vector multiplication?

2. *(30 pts)* Download the stream benchmark program mentioned in the paper (link is provided on course website) and run it on your computer.

   (a) Submit the result of the benchmark.

   (b) What does the benchmark measure?

   (c) Given the result of the benchmark on your computer, compute an upper bound (and show how you did it) for the performance (in Gflop/s) for adding two vectors of length n that reside in main memory:

   ```
   for i = 1:n
     c[i] = a[i] + b[i];
   ```