For this assignment, we will use the single-node PolyBench benchmarks at 
www.cse.ohio-state.edu/~pouchet/software/polybench. and Hydra, or Beacon, 
one of the EECS machines. If you do not have access to these machines, 
please let me know. In this case you may choose any other machine you have 
access to.

You may choose to use either Fortran or C. You may choose any two kernel 
benchmarks to work with or construct your own kernel benchmark by modifying 
one of those in PolyBench. 
Read Hager and Wellein Chapter 3 for background. 
See also Samuel Williams, Andrew Waterman, and David Patterson. 2009. 
Roofline: an insightful visual performance model for multicore 

1. Determine the machine characteristics of a Hydra node from processor specifications and/or low-level benchmarks.
2. Construct analytical models for your kernel benchmarks based on an analysis of their arithmetic intensity and use the models to predict performance on Hydra.
3. Run your kernel benchmarks for different size problems and measure the results. Discuss possible reasons for differences from your predicted performance and refine your analytical models if possible.