CS 475 Projects

Sanjay Rajopadhye
Colorado State University

Project Goals

- Apply the methods you learned so far to “something substantial.”
- Use the principles and extrapolate them to scale
- Tackle something that someone cares about enough to seek an improved performance.
- Have fun (the most important goal)
Grading Rubric (overall 15%)

- Initial study (4%)
- The work itself (9%)
  - Methods Used
  - Effectiveness
  - Iterations
- Report/Presentation (4%)

Initial Study (100 pts)

- Form a team (10)
  - Who you are
- Pick an application and platform (10)
  - What is the problem and why is it important
  - Justify the target
- Study the code (30)
- Measure baseline performance (30)
- Set yourself a target, with justification (10)
- Write this up (10)
  - Tell a story
Work Itself (100 pts)

- Loop through the iterative process
  - Try to get low hanging fruit first
- Keep a log
  - Things that you try initially may not work, but may become applicable after other things are done
- Keep track of lessons learnt
- Look back (how much the performance improved)
- Look ahead (how far to the machine peak)

Presentation/Report (100 pts)

Options: some combination of
- Presentation (slideshow) in class
- Poster session
- Report

Let's poll for choices
Team size

A. I plan to work with a partner
B. I plan to work alone
C. Undecided

My first choice is

A. Presentation (slideshow) in class
B. Poster session
C. Report
D. Other options(?)
My second choice is

A. Presentation (slideshow) in class

B. Poster session

C. Report

D. Other options(?)

Sample projects

- DoE (Department of Energy) Exascale project(s)
- piRNA and its ilk (all source code is available)
  - piRNA 96 * (N*M)^6 double precision floating pt
  - BPMax 2 * (N*M)^6 and only does max-plus on ints (maybe even shorts)
  - BPart 10 * * (N*M)^6
- Back Propagation Learning
  - Challenge: get as close to TMP as possible
- Civil engg code (MCSim)
  - Challenge: real life code, (some) low hanging fruit may have nothing to do with parallelism