CS 366
Assignment #6
Poly want a nomial ... fast!
Due 4/17/17, in class

Goal
Study processor-level optimization.

Problem Statement
Our lads, Sponge Bob and Patrick, have a polynomial system to beat the stock market as long as they can evaluate polynomials fast! A polynomial such as $a_0 + a_1 x + a_2 x^2 + \cdots + a_n x^n$ can be evaluated given coefficient values, $a_i$, and a value for $x$. There is a need for speed.

Your task is to create a faster version of the code found in the repo using the optimization techniques explored in Chapter 5 (e.g., loop unrolling, parallel accumulation, re-associations, etc.).

What to hand in (Please no .docx files.)

(1) A well-formatted 2-up postscript file of your source code checked into your repository named src.ps. You must use a2ps after removing all the tabs from your code. Indent code 2 or 4 spaces at most.

(2) A GitHub repo that includes (you must use these names as the grading script will assume their use!)
   • README.md,
   • poly.c, and
   • Makefile (where make all and make test will build and test your code).

Assignment Notes
• Please make changes one at a time. Document each change in README.md with five things
  0) a section title with a good name,
  1) a description of the change,
  2) the motivation for the change,
  3) a copy of the function poly() that results from the change, and
  4) the CPE output line from the run (copy and paste this).
• FYI, the test harness generates random values for each $a_i$, using $(\text{random()} \ & \ 0x1) \ ? \ 1 : -1$ and uses the value 3 for $x$.
• I expect to pull your code, run make, and then run my test script.
• The output of git log will again factor into your grade.
• The book’s authors note “Ideally you should be able to reach a CPE close to the throughput limit of your machine. Our best version achieves a CPE of 1.07 on our reference machine.”
• Here is the git classroom invitation
  https://classroom.github.com/assignment-invitations/ba52c5f009c0f93b4cbd14ac8c7bfe1
• Five, count-em 5 bonus points to the program that achieves the lowest CPE!!!