

Algorithm Engineering

Exercise No. 5

Monday 17th November, 2014

Submission

- (1) Submit your solution with `$ git request-pull` (or similar) to jkm@informatik.uni-jena.de. Don't forget to attach the measurement plots.

1 Improve computing the n th power

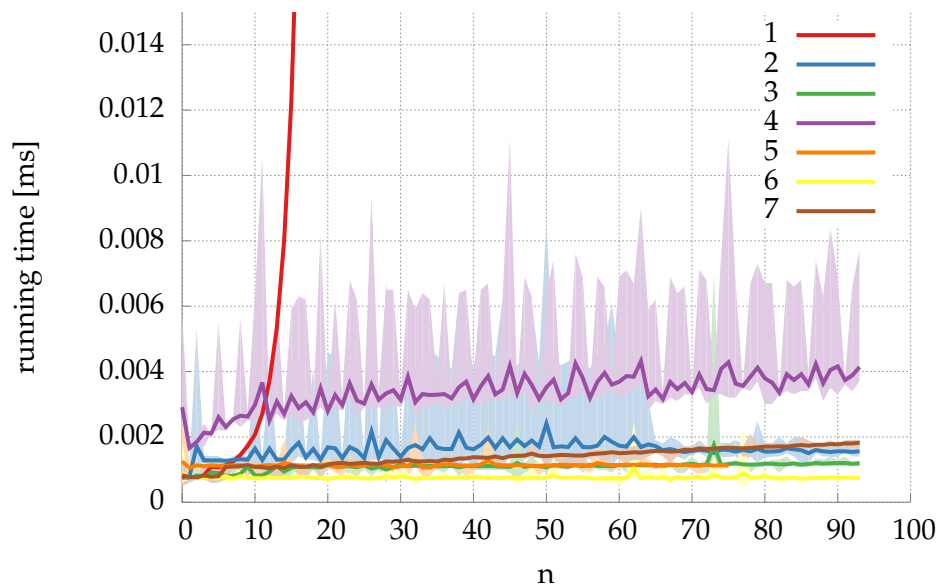
Compute A^n for $n \in \mathbb{N}$ and some $A \in \mathbb{R}^{n \times n}$ with constant memory. How does the new implementation affect the performance of the respecting Fibonacci algorithm? Repeat the measurements and compare your plots!

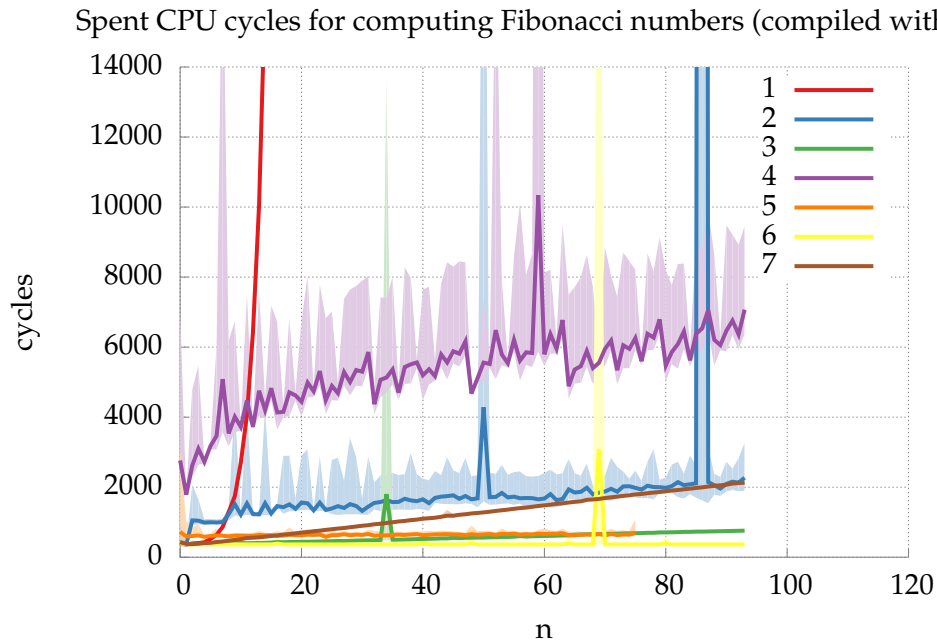
2 Visualize your measurements

Visualizing the measurements gives you an easy to grasp overview of your implementations. Here we are interested in the practical performance of the "Fibonacci" implementation for increasing n . Plot the wall clock time (in ms) and the number of cycles as a function of n .

Send the generated plots by email.

Running time for computing Fibonacci numbers (compiled with gdc)





3 Sorting

Implement the following well-known algorithms for comparison-based sorting.

- Insertion sort
- Quicksort

Are they (time) optimal? Why? Why not?