Brno University of Technology
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Profiling report

Practical Aspects of Software Design

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Chapter 1

Assignment

Using functions from your math library, create a program (as a separate executable file) to calculate the standard deviation of the sequence of numbers that the program reads from the standard input (in C, for example, using scanf) until the end of the file and must be able to load min. 1000 numbers. The input file contains only numbers separated by white characters (space, line break or tab) and their quantity is not predetermined. Formula for the sampling standard deviation to be used:

$s = \sqrt{\frac{1}{N-1}(\sum_{i=1}^{N} x_i^2 - N\bar{x}^2)}$
$\bar{x} = \frac{1}{N}\sum_{i=1}^{N} x_i$

Example of running a program:
./stddev < data.txt

This program profile with inputs of size 10, 100 and 1000 numerical values. Submit a log containing the output of the profiler and a brief summary - in which places the program spends the most time and indicate what is best to focus on when optimizing the code.

Chapter 2

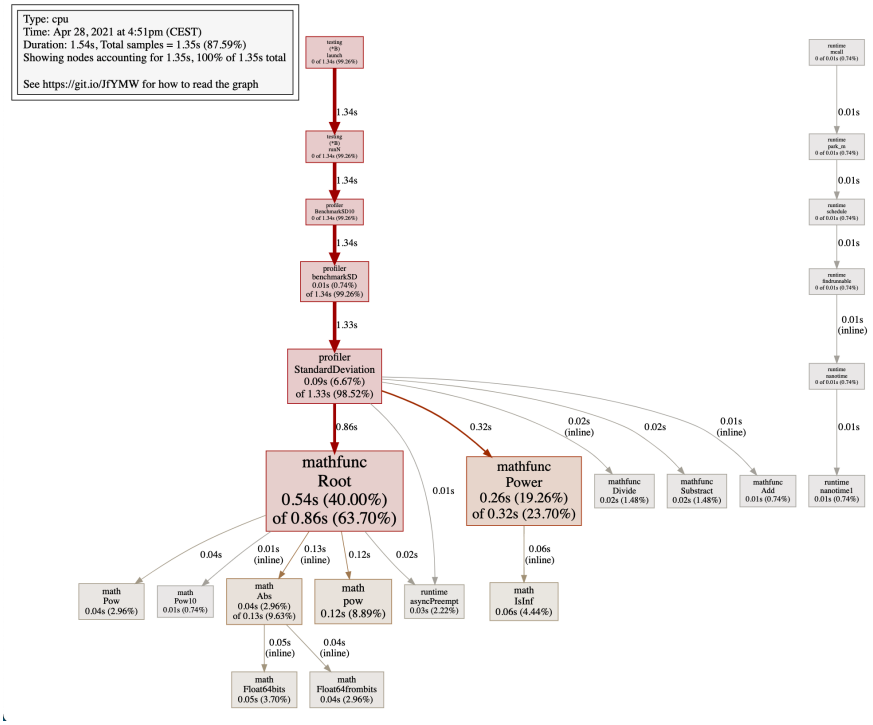
Results

The tools that were chosen to profile the program are builtin Go's profiling tools. By using these tools it is possible to identify why and where the program runs slowly. The code used the Go testing package and after that it is possible to use standard Go flags: -memprofile and -cpuprofile.

```
$ go test -bench=. -run=x -benchmem -memprofile mem.pprof -cpuprofile cpu.pprof
goos: darwin
goarch: amd64
pkg: ivs-calculator/cmd/profiler
cpu: Intel(R) Core(TM) i5-8210Y CPU @ 1.60GHz
BenchmarkSD10-4          5692274              196.7 ns/op             0 B/op          0 allocs/op
BenchmarkSD100-4         1614073              738.8 ns/op             0 B/op          0 allocs/op
BenchmarkSD1000-4         173610             6414 ns/op              12 B/op          0 allocs/op
PASS
ok      ivs-calculator/cmd/profiler     5.096s
```

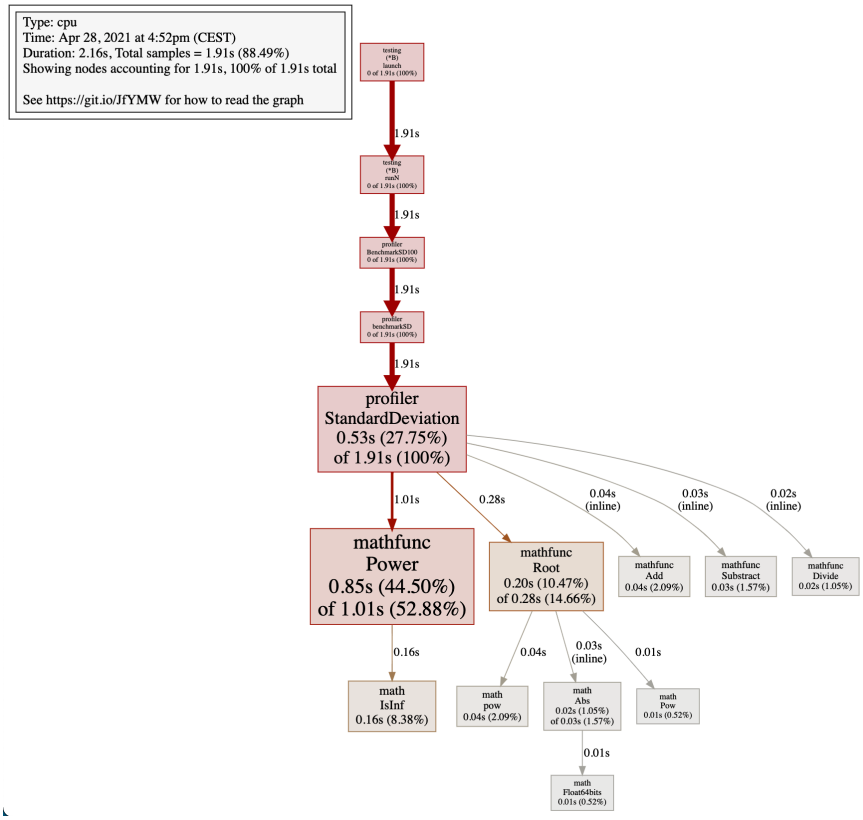
Chapter 3

Visualisation with 10 inputs



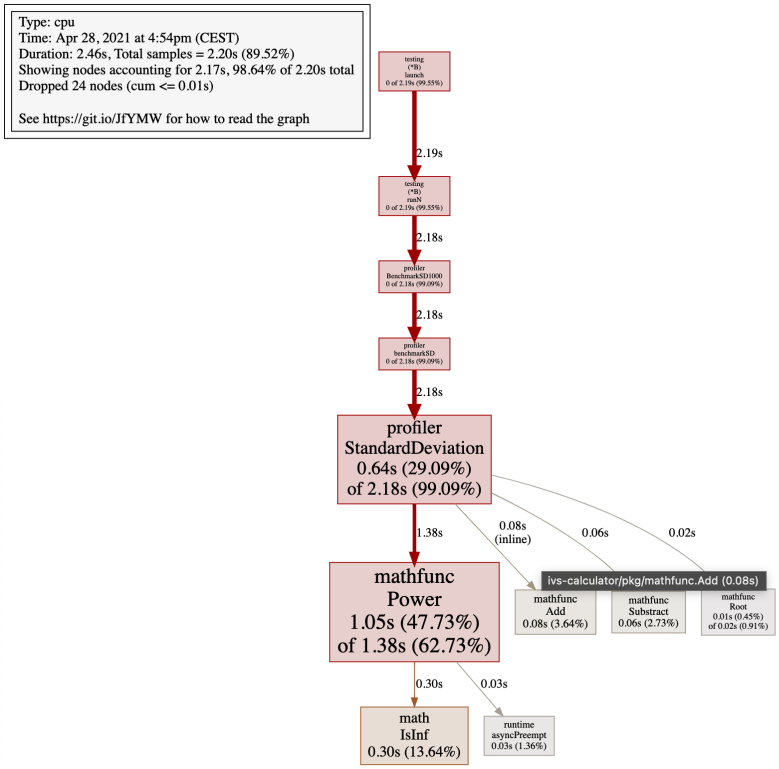
Chapter 4

Visualisation with 100 inputs



Chapter 5

Visualisation with 1000 inputs



Chapter 6

Total visualisation