

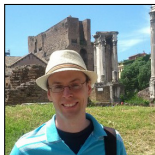
An investigation into the warmup behaviour of various virtual machines



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Goal

- measure “warmup”
- completely unclear how

- Hotspot JVM
- Graal JVM
- JRuby Truffle
- V8
- LuaJIT
- HHVM
- PyPy
- CPython

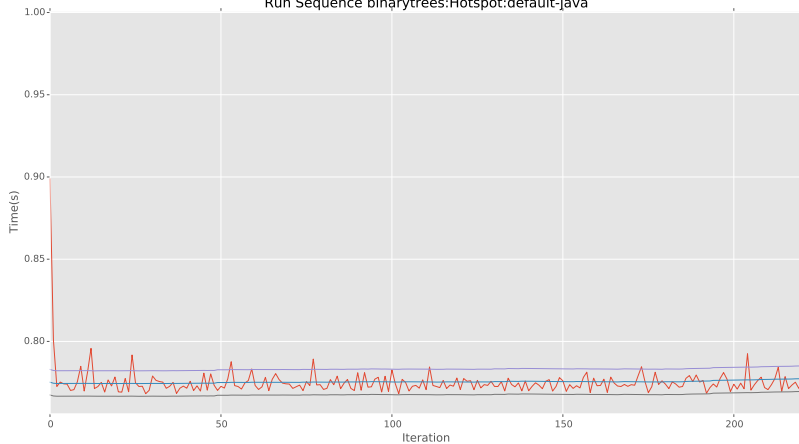
Benchmarks

- binarytrees
- fannkuchredux
- fasta
- nbody
- richards
- spectralnorm

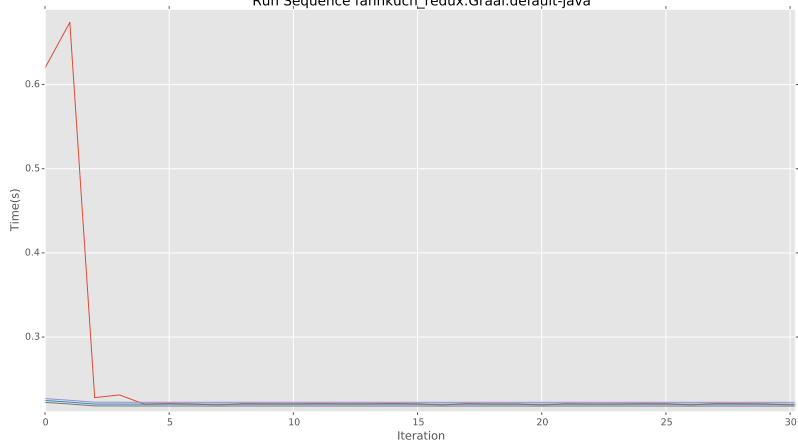
What we hope to see

- some slow iterations (ideally one)
- fast iterations
- maybe another slow one
- very fast ones, with some noise

Run Sequence binarytrees:Hotspot:default-java



Run Sequence fannkuch_redux:Gaal:default-java

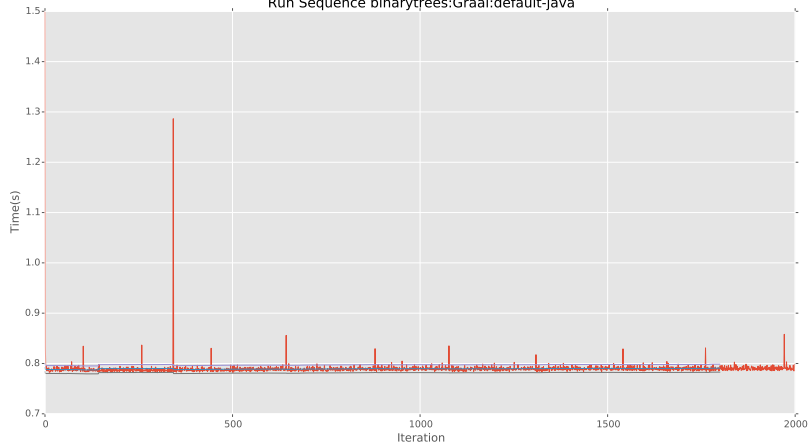


Weird things we find in practice

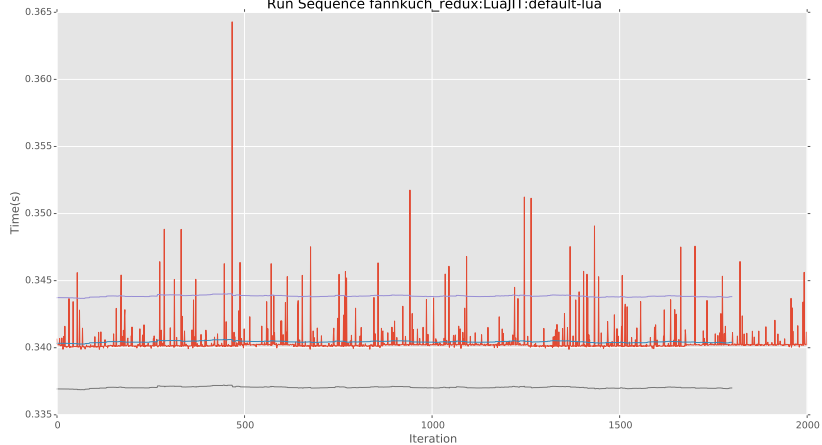
- outliers
- slowdowns
- late phase changes
- cyclic behaviour

Outliers

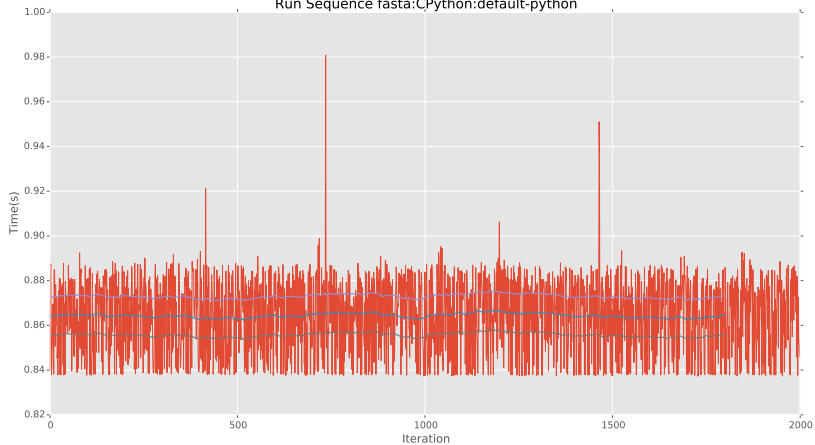
Run Sequence binarytrees:Graal:default-java



Run Sequence fannkuch_redux:LuaJIT:default-lua

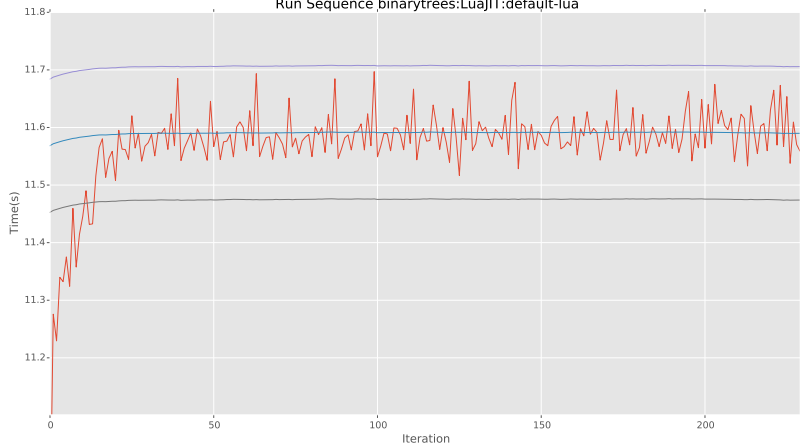


Run Sequence fasta:CPython:default-python



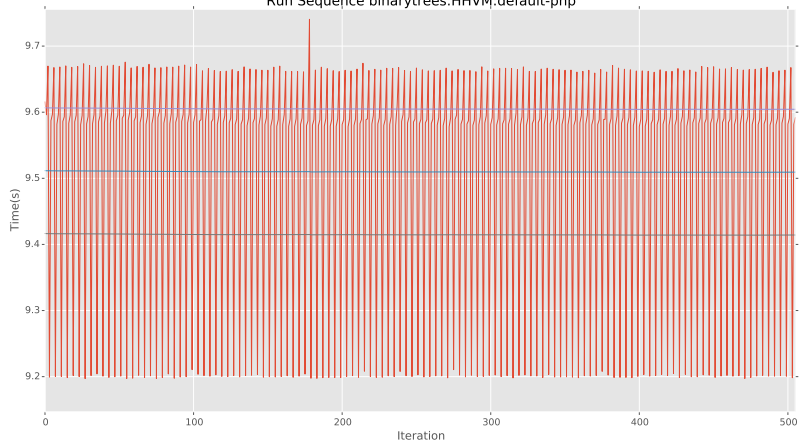
Slowdowns

Run Sequence binarytrees:LuaJIT:default-lua

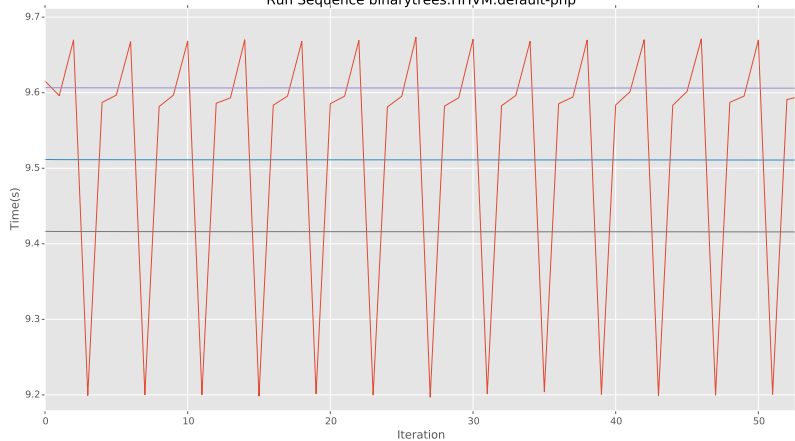


Cyclic behaviour

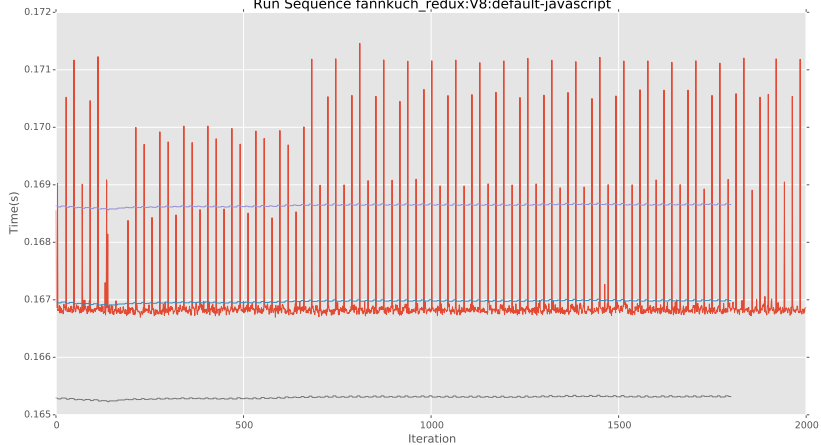
Run Sequence binarytrees:HHVM:default-php



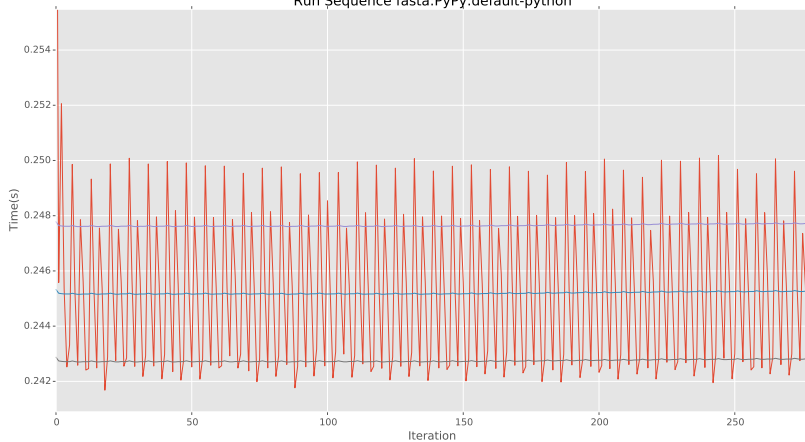
Run Sequence binarytrees:HHVM:default-php



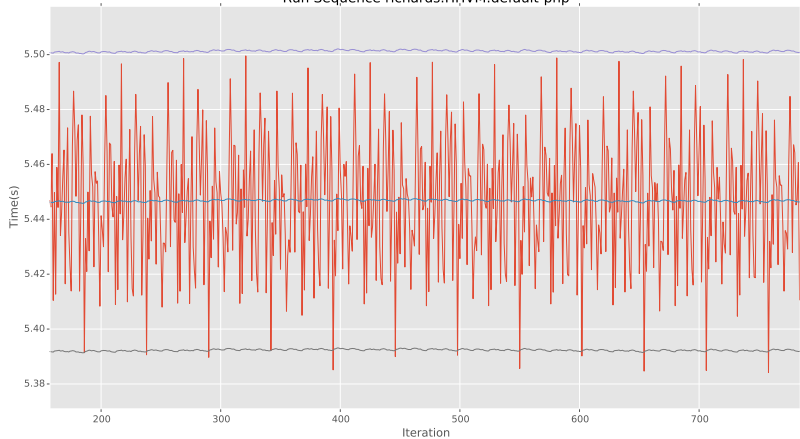
Run Sequence fannkuch_redux:V8:default-javascript



Run Sequence fasta:PyPy:default-python

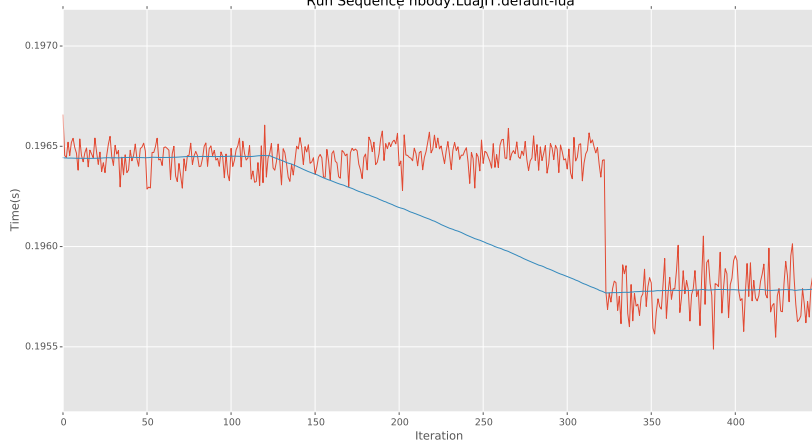


Run Sequence richards:HHVM:default-php

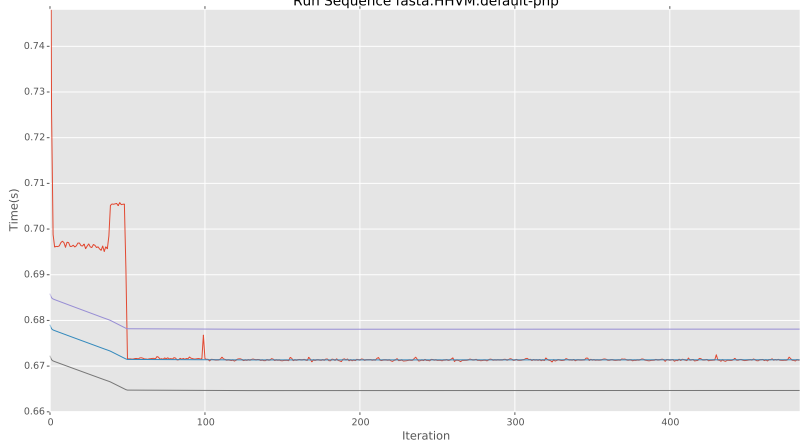


Late phase changes

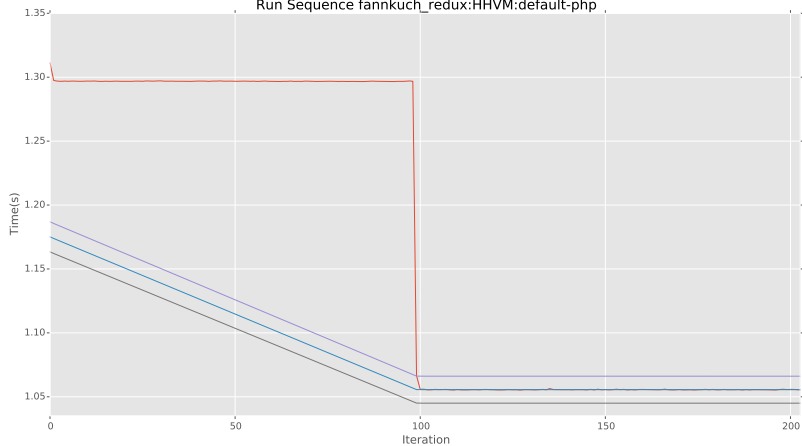
Run Sequence nbody:LuaJIT:default-lua



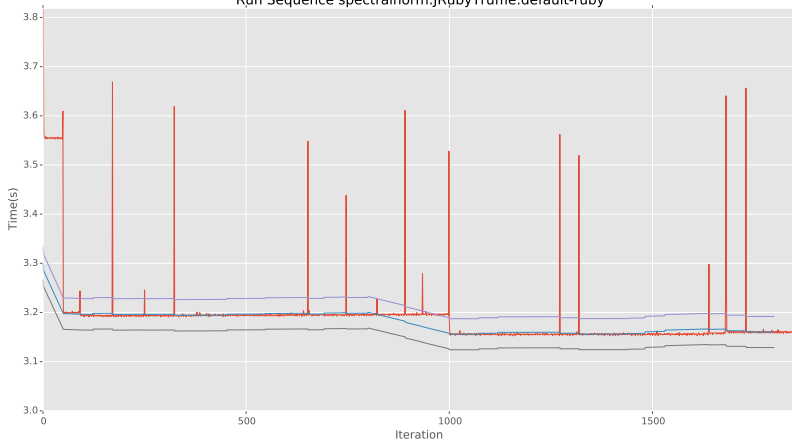
Run Sequence fasta:HHVM:default-php



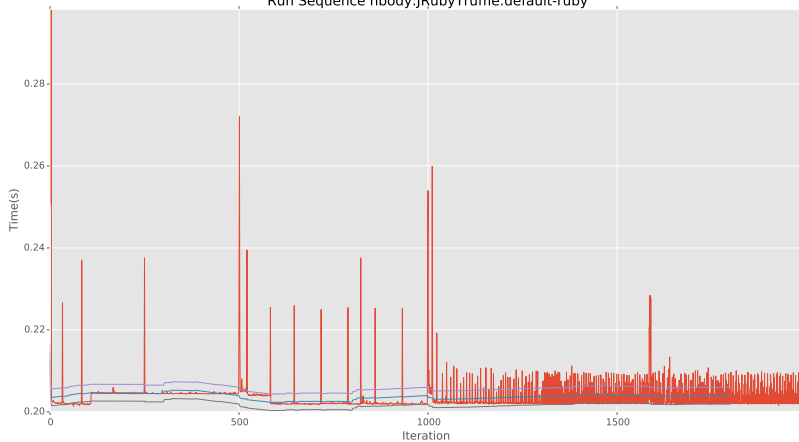
Run Sequence fannkuch_redux:HHVM:default-php



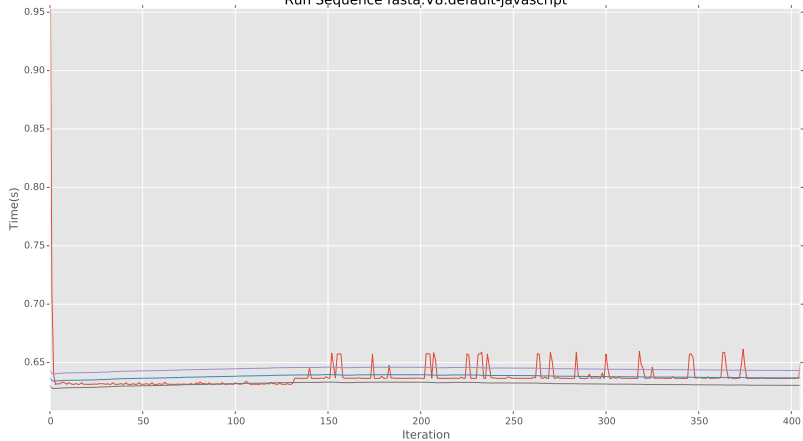
Run Sequence spectralnorm:JRubyTruffle:default-ruby



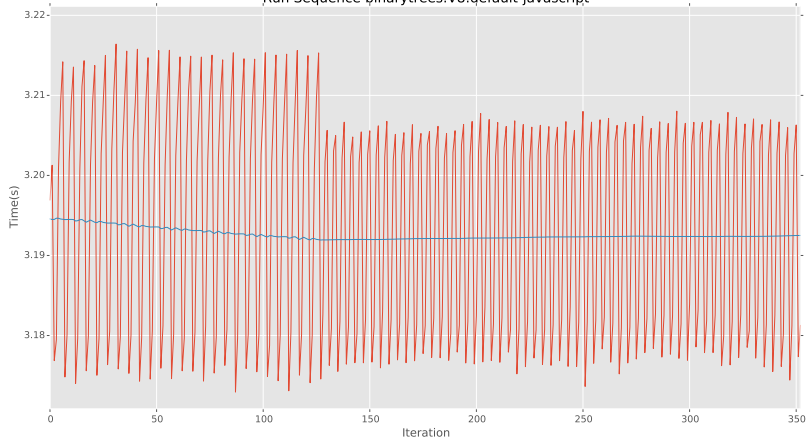
Run Sequence nbody:JRubyTruffle:default-ruby



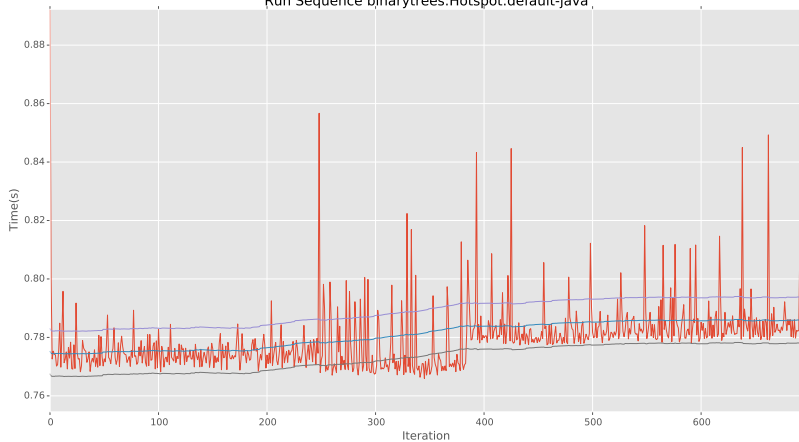
Run Sequence fasta:V8:default-javascript



Run Sequence binarytrees:V8:default-javascript



Run Sequence binarytrees:Hotspot:default-java



Now what?