

Profiling

Keďže sme profiling sme realizovali v NetBeans IDE 8.2, ako výstup profilingu sme priložili screenshoty profilingu. Analýzou sa zoberáme len v prípade funkcií našej matematickej knižnice, ostatné funkcie, ktoré sa v main volajú sme nebrali do úvahy.

Výstup z profileru pri zadaní 10 hodnôt:

Name	Total Time	Total Time (CPU)
Finalizer	5.014 ms (100%)	0.136 ms (100%)
main	4.329 ms (100%)	4.098 ms (100%)
profiling.Profiler.main (String[])	4.089 ms (94.4%)	4.089 ms (99.8%)
java.util.Scanner.nextInt ()	4.037 ms (93.3%)	4.037 ms (98.5%)
java.util.Scanner.<init> (java.io.InputStream)	30.7 ms (0.7%)	30.7 ms (0.8%)
java.util.Scanner.<clinit> ()	13.2 ms (0.3%)	13.2 ms (0.3%)
java.lang.ClassLoader.loadClass (String)	3.49 ms (0.1%)	3.49 ms (0.1%)
profiling.math.sub (double, double)	3.37 ms (0.1%)	3.37 ms (0.1%)
java.lang.String.valueOf (double)	1.3 ms (0%)	1.3 ms (0%)
java.math.BigDecimal.<init> (String)	0.702 ms (0%)	0.702 ms (0%)
java.math.BigDecimal.<clinit> ()	0.639 ms (0%)	0.639 ms (0%)
Self time	0.517 ms (0%)	0.517 ms (0%)
java.math.BigDecimal.subtract (java.math.BigDecimal)	0.476 ms (0%)	0.476 ms (0%)
Self time	0.335 ms (0%)	0.335 ms (0%)
profiling.math.root (double, double)	0.150 ms (0%)	0.150 ms (0%)
org.netbeans.lib.profiler.server.ProfilerServer.activate (String, int, int, int)	231 ms (5.4%)	0.0 ms (0%)
sun.launcher.LauncherHelper.checkAndLoadMain (boolean, int, String)	4.57 ms (0.1%)	4.57 ms (0.1%)
sun.misc.PostVMInitHook.run ()	4.23 ms (0.1%)	4.23 ms (0.1%)
java.lang.Thread.exit ()	0.129 ms (0%)	0.129 ms (0%)
Reference Handler	2.356 ms (100%)	0.393 ms (100%)
DestroyJavaVM	3.74 ms (100%)	3.74 ms (100%)
Thread-2	1.49 ms (100%)	1.49 ms (100%)
process reader	0.0 ms (-%)	0.0 ms (-%)


```
10
Profiler Agent: Connection with agent closed
Profiler Agent: Connection with agent closed
Profiler Agent: Initializing...
Profiler Agent: Options: >/home/bblaskova/netbeans-8.2/profiler/lib,5140,10<
Profiler Agent: Initialized successfully
Profiler Agent: 250 classes cached.
Profiler Agent: 250 classes cached.
Profiler Agent: 250 classes cached.
Profiler Agent: 250 classes cached.
BUILD SUCCESSFUL (total time: 10 seconds)
```

Z obrázku je vidieť, že najviac času program strávil pri tomto počte hodnôt funkciou odčítania a to z dôvodu použitia knižnice *BigDecimal*. *BigDecimal* sme museli použiť, pretože inak funkcia zle zaokrúhľovala čísla.

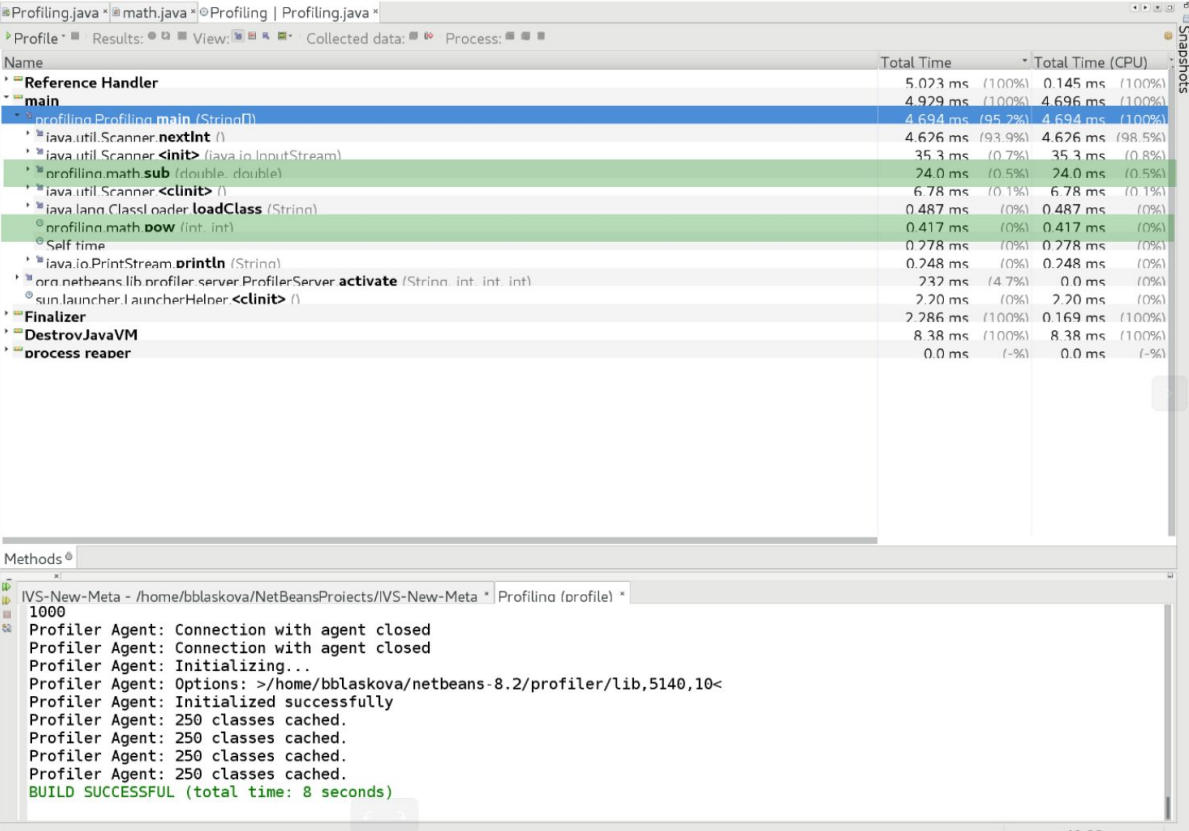
Výstup z profileru pre 100 hodnôt:

Name	Total Time	Total Time (CPU)
Finalizer	8.076 ms (100%)	0.545 ms (100%)
main	5.682 ms (100%)	5.427 ms (100%)
profiling.Profiling.main (String[])	5.417 ms (95.3%)	5.417 ms (99.8%)
java.util.Scanner.nextInt ()	5.381 ms (94.7%)	5.381 ms (99.1%)
java.util.Scanner.<init> (java.io.InputStream)	26.2 ms (0.5%)	26.2 ms (0.5%)
profiling.math.sub (double, double)	4.54 ms (0.1%)	4.54 ms (0.1%)
java.util.Scanner.<clinit> ()	2.47 ms (0%)	2.47 ms (0%)
java.lang.ClassLoader.loadClass (String)	1.86 ms (0%)	1.86 ms (0%)
Self time	1.6 ms (0%)	1.6 ms (0%)
java.io.PrintStream.println (String)	0.553 ms (0%)	0.553 ms (0%)
profiling.math.root (double, double)	0.137 ms (0%)	0.137 ms (0%)
org.netbeans.lib.profiler.server.ProfilerServer.activate (String, int, int, int)	255 ms (4.5%)	0.0 ms (0%)
sun.launcher.LauncherHelper.checkAndLoadMain (boolean, int, String)	5.34 ms (0.1%)	5.34 ms (0.1%)
java.lang.System.getProperty (String)	4.3 ms (0.1%)	4.3 ms (0.1%)
Reference Handler	2.487 ms (100%)	0.165 ms (100%)
DestroyJavaVM	1.8 ms (100%)	1.8 ms (100%)
Thread-2	0.412 ms (100%)	0.412 ms (100%)
process reader	0.0 ms (-%)	0.0 ms (-%)

100
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Profiler Agent: 250 classes cached.
BUILD SUCCESSFUL (total time: 10 seconds)

Opäť najviac času zabralo programu spracovať funkciu odčítania a taktiež sa tu objavila funkcia odmocnenia čísla.

Výstup z profileru pre 1000 hodnôt:



Name	Total Time	Total Time (CPU)
Reference Handler	5.073 ms (1.00%)	0.145 ms (1.00%)
main	4.929 ms (1.00%)	4.696 ms (1.00%)
profiling.Profiler.main (String[])	4.694 ms (95.2%)	4.694 ms (100%)
java.util.Scanner.nextInt ()	4.676 ms (93.9%)	4.676 ms (98.5%)
java.util.Scanner.<init> (java.io.InputStream)	35.3 ms (0.7%)	35.3 ms (0.8%)
profiling.math.sub (double, double)	74.0 ms (0.5%)	74.0 ms (0.5%)
java.util.Scanner.<clinit> ()	6.78 ms (0.1%)	6.78 ms (0.1%)
java.lang.ClassLoader.loadClass (String)	0.487 ms (0%)	0.487 ms (0%)
profiling.math.pow (int, int)	0.417 ms (0%)	0.417 ms (0%)
Self time	0.278 ms (0%)	0.278 ms (0%)
java.io.PrintStream.println (String)	0.248 ms (0%)	0.248 ms (0%)
org.netbeans.lib.profiler.server.ProfilerServer.activate (String, int, int, int)	232 ms (4.7%)	0.0 ms (0%)
sun.launcher.LauncherHelper.<clinit> ()	2.70 ms (0%)	2.70 ms (0%)
Finalizer	2.286 ms (1.00%)	0.169 ms (1.00%)
DestroyJavaVM	8.38 ms (1.00%)	8.38 ms (1.00%)
process reader	0.0 ms (-%)	0.0 ms (-%)

Methods
1000
Profiler Agent: Connection with agent closed
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Profiler Agent: Options: >/home/bblaskova/netbeans-8.2/profiler/lib,5140,10<
Profiler Agent: Initialized successfully
Profiler Agent: 250 classes cached.
Profiler Agent: 250 classes cached.
Profiler Agent: 250 classes cached.
Profiler Agent: 250 classes cached.
BUILD SUCCESSFUL (total time: 8 seconds)

Výstup je viac-menej rovnaký, len namiesto odmocnenia čísla viac času zabralo umocnenie čísla.

Všetky vyššie spomenuté funkcie boli v porovnaní s časom volania a spracúvania ostatných zanedbateľné (vždy to trvalo menej ako 0.5% času behu programu). Ostatné funkcie sa vo výstupe profileru sa dôsledkom ich krátkeho trvania ani neobjavili. Preto sme tieto funkcie ďalej neoptimalizovali.

Pri optimalizácii je podľa nás dôležité zamerať sa na to, aby aj keď program bežal rýchlo, aby nestratil svoju spoľahlivosť a aby sa nezvýšila chybovosť programu.