

Nurse rostering competition 2010: Geoffrey De Smet

Introduction

I am the creator of the Drools Planner framework. With Drools Planner, I created this nurse rostering competition implementation for all 3 tracks.

For an official benchmark, use Linux (preferably Fedora or Ubuntu).

Installation instructions

1) Install JDK 6

Install Sun's Java SE Development Kit 6 Update 20 (or higher). On Linux, you can get it from the repositories. On Windows, you can download it from:

<http://java.sun.com/javase/downloads/index.jsp> (JDK 6 Update 20)

Do not install the JDK into a directory with spaces. Directory with spaces cannot be handled by the run scripts. The JDK installation will also install the latest JRE.

The JRE alone (a normal java runtime) doesn't suffice, because it doesn't support the `-server` flag for higher optimization (slower initialization, more memory hungry but a 50% performance gain).

JDK 5 doesn't suffice, because JDK 6 has a 30% performance gain.

2) Set JAVA_HOME environment variable

Linux

Export an environment variable to the path of the JDK installation directory, for example:

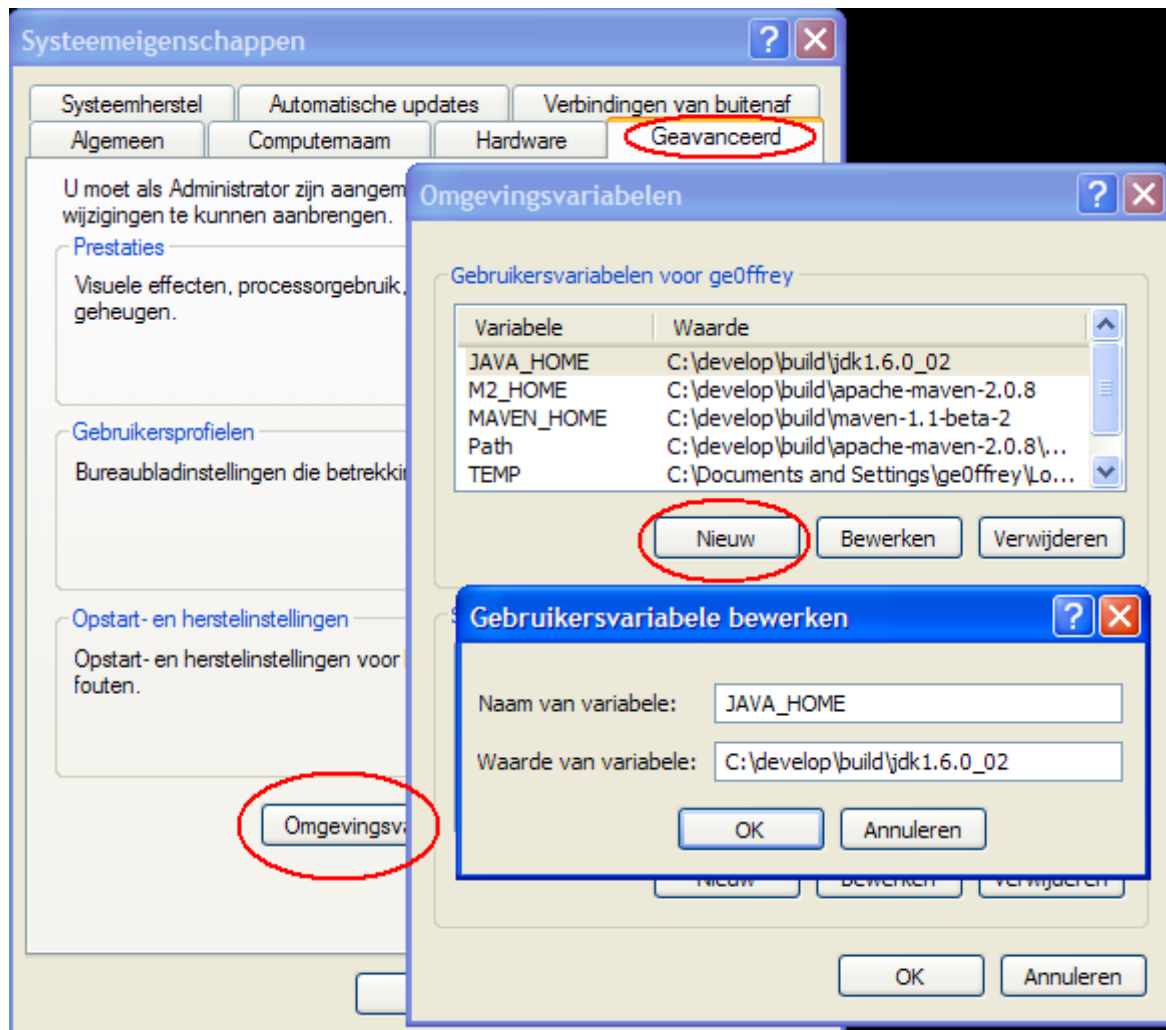
```
export JAVA_HOME=/usr/lib/jvm/java-6-sun
```

Use Sun's JDK 6 on Linux. Do not use OpenJDK 6 (usually the default JDK on linux). Only starting from version 7, OpenJDK will be on par with the Sun JDK. You can check the JDK implementation by doing:

```
$ java -version
java version "1.6.0_20"
Java(TM) SE Runtime Environment (build 1.6.0_20-b02)
Java HotSpot(TM) Server VM (build 16.3-b01, mixed mode)
```

Windows XP

Open menu **Control panel**, menu item **System properties**, tab **Advanced**, button **Environment variables**, button **New** and add a variable with the name **JAVA_HOME** and the value of the path to the JDK installation directory. For example:



3) On windows only: install Cygwin

Download and install Cygwin (a linux emulator) from:

<http://www.cygwin.com/>

Alternatively, you can probably easily transform the .sh scripts into .bat scripts.

Running the solver

Adding or removing input files

You can add or remove competition files under the directory:

```
<zip_directory>/input
```

Important note: your competition files should either start with the prefix `sprint`, `medium` or `long` because otherwise they will be ignored.

After running the solver you will find the XML output files under the directory:

```
<zip_directory>/output
```

Running the solver from command line

Open the command shell (either linux shell or cygwin shell) and navigate to the directory where you unzipped the zip file (<zip_directory>). Make sure that that directory doesn't contain any spaces.

Run the script `nurseRosteringSprint.sh`, `nurseRosteringMedium.sh` or `nurseRosteringLong.sh` and optionally supply an argument with the maximum seconds

spend per solution. For example if the benchmarking machine has 10 seconds to spend:

```
./nurseRosteringSprint.sh 10
```

Each track has it's own script:

```
./nurseRosteringMedium.sh 600
```

```
./nurseRosteringLong.sh 36000
```

Run this command only from the directory in which the script is located.

Drools Planner information

Drools Planner website

The Drools Planner website is:

<http://www.jboss.org/drools/drools-planner.html>

Building from source

The latest manual contains information on how to build from source. It is usually available at:

https://hudson.jboss.org/hudson/job/drools/lastSuccessfulBuild/artifact/trunk/target/docs/drools-planner/html_single/index.html

This allows you to play around with the solver configuration and maybe even find better and faster configurations.