

Appendix E

User Manual for the Plugin SAGEMATH

- To use the SAGEMATH plugin, the user must launch the Eclipse platform and then open the workspace containing our plugin project called "fr.upec.sageplugin" (see Figure E.1). This project contains various classes that we used to define the functionality provided by the plugin (see Figure E.2).

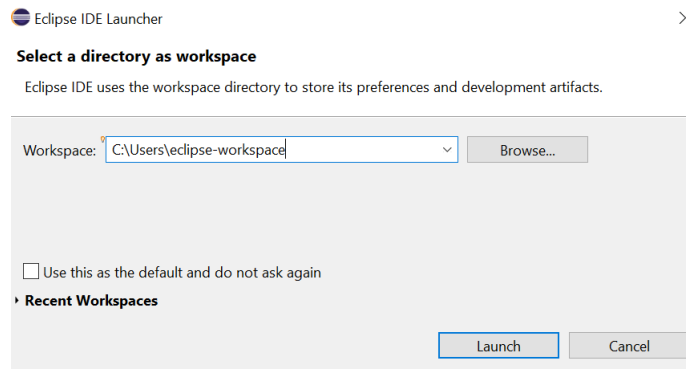


Figure E.1: Using plugin SAGEMATH: Step 1.

- Then the user should launch Rodin from within eclipse, using Rodin as the target platform. For this purpose, first open the "Run/Run configurations" menu (see Figure E.3) and double click on "Eclipse Application" on the left to create a new configuration and rename the configuration to "Rodin 3.5". On the "Main" tab, select "Location" for the run-time workspace and select "org.rodin.platform.product" for the "Run a product" option (see Figure E.4). In the "Plug-ins", for "Launch with" option, choose "plug-ins selected below only". In the Plugins list, disable all test plugins for the Target platform (see Figure E.5).
- The user can then run a version of Rodin with the SAGEMATH plugin integrated and upload the project containing the differential equations to be solved with SAGEMATH, remembering to open the project named "SimpleDEq" containing the theory needed to prove our EVENT-B models (see Figure E.6).
- The user can finally open the proof obligations that contains the terms $B_desolve$ in order to call SAGEMATH. This is done by clicking in the goal tab on the left-hand side to get a button called SAGEMATH (see Figure E.7).

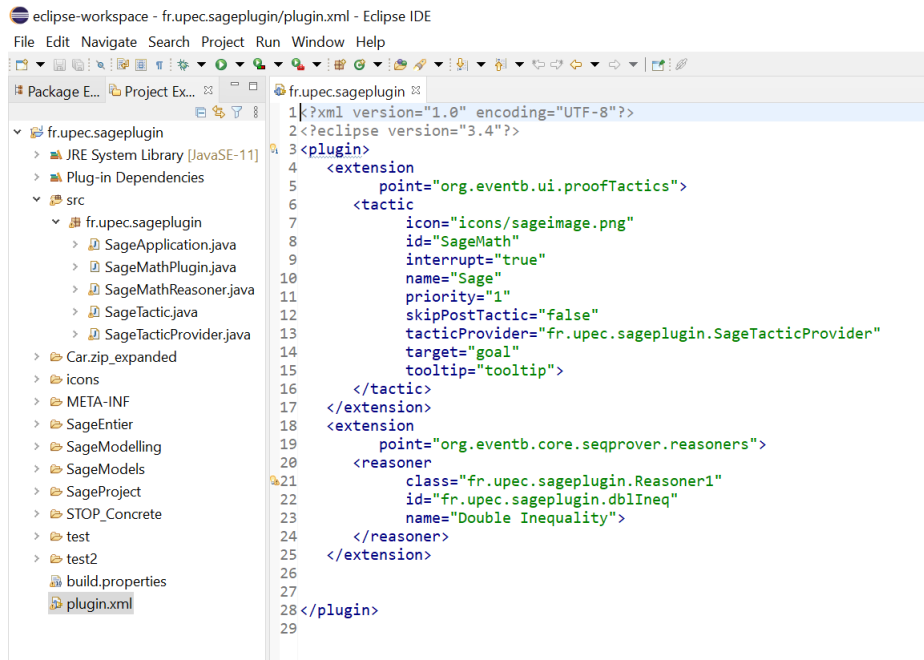


Figure E.2: Using plugin SAGEMATH: Step 2.

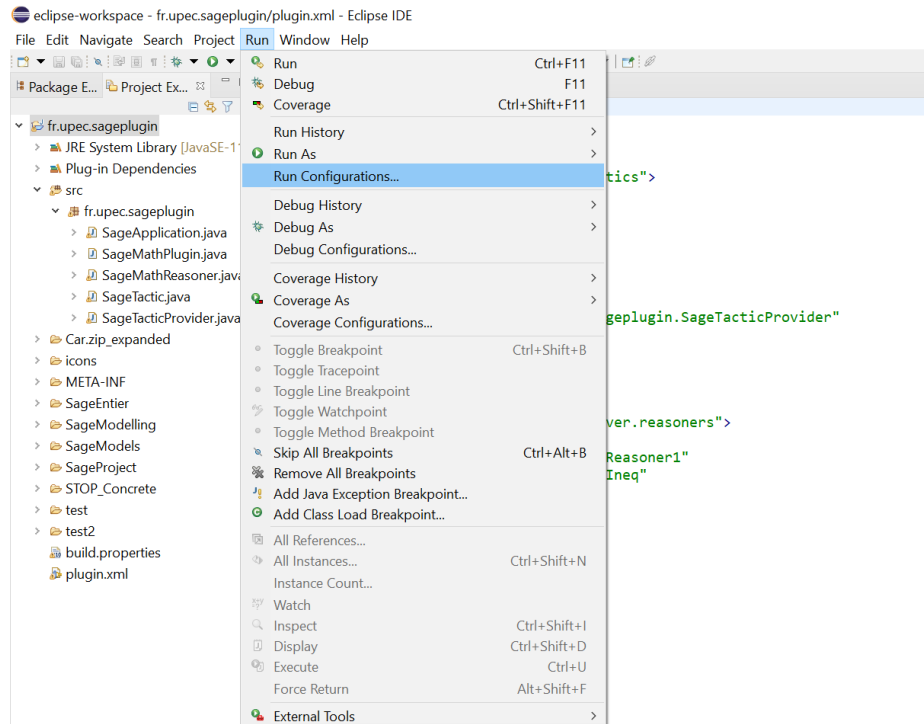


Figure E.3: Using plugin SAGEMATH: Step 3.

The user can eventually open the proof obligations containing the terms, $B_desolve$ or $B_desolve_rk4$, and then invoke SAGEMATH. To do this, click on the left side of the goal tab to get a button called SAGEMATH (see Figure E.7).

- Finally, the user calls SAGEMATH and executes the command line `load("script1.sage")`. This allows the user to execute the statements defined in "script1.sage" script in order

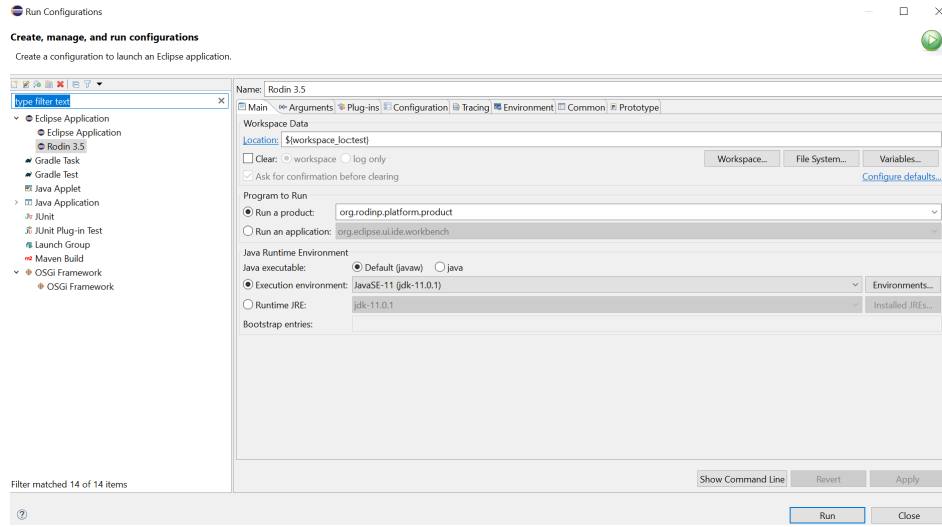


Figure E.4: Using plugin SAGEMATH: Step 4.

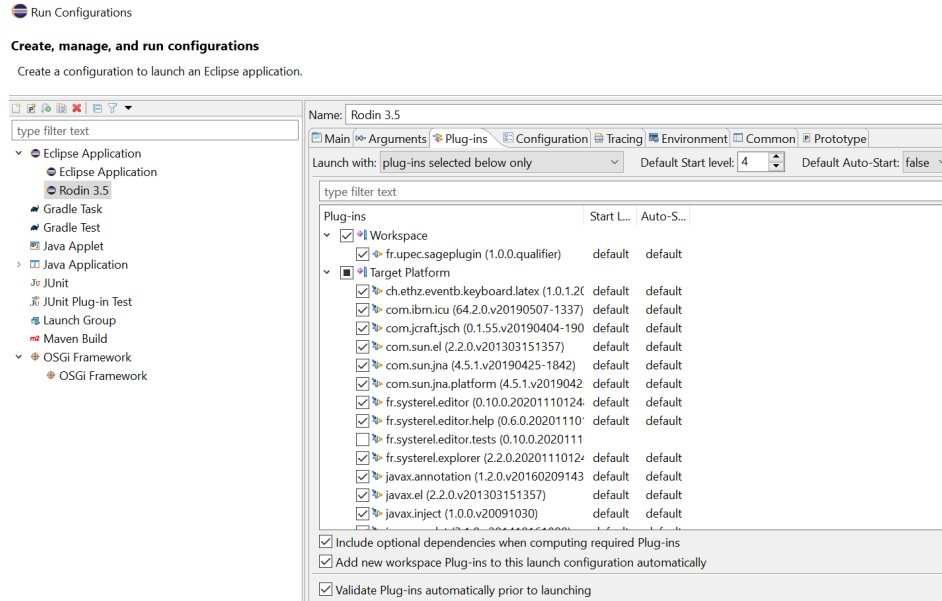


Figure E.5: Using plugin SAGEMATH: Step 5.

to solve the ordinary differential equation determined by the function $B_desolve$ in the current proof obligation (see Figure E.8).

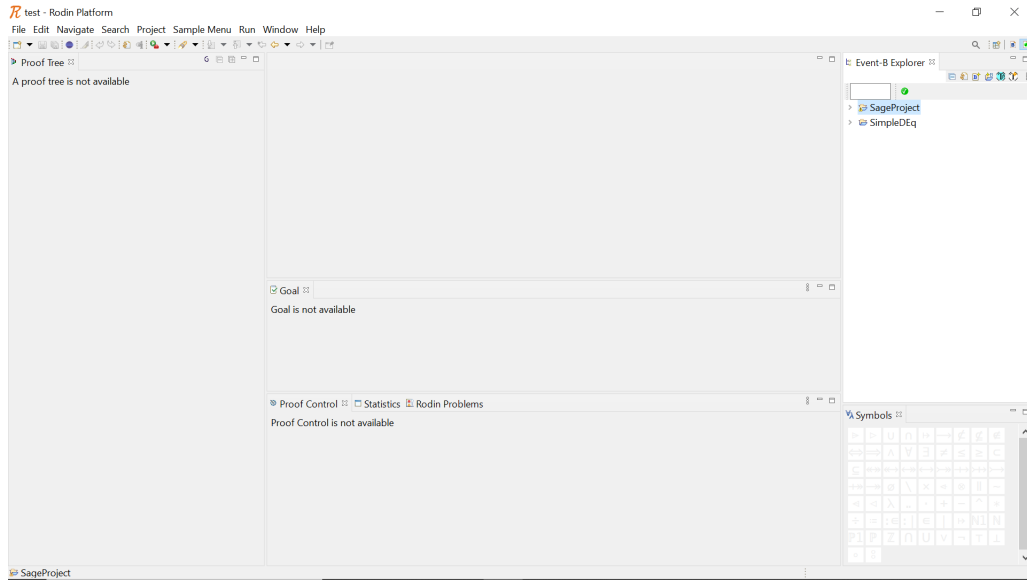


Figure E.6: Using plugin SAGEMATH: Step 6.

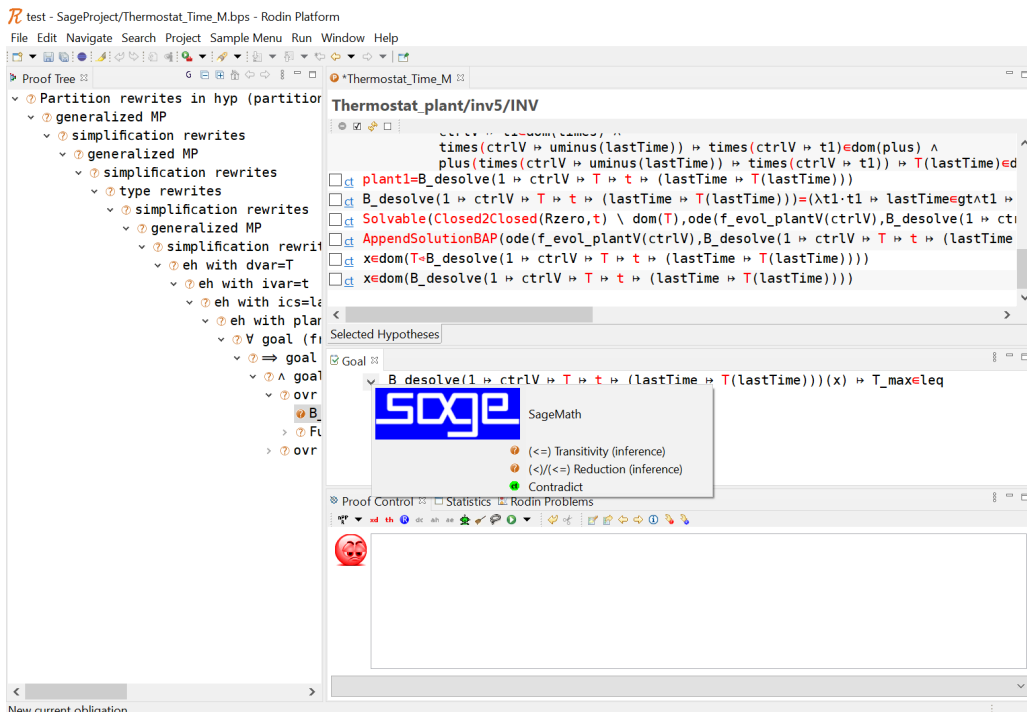


Figure E.7: Using plugin SAGEMATH: Step 7.

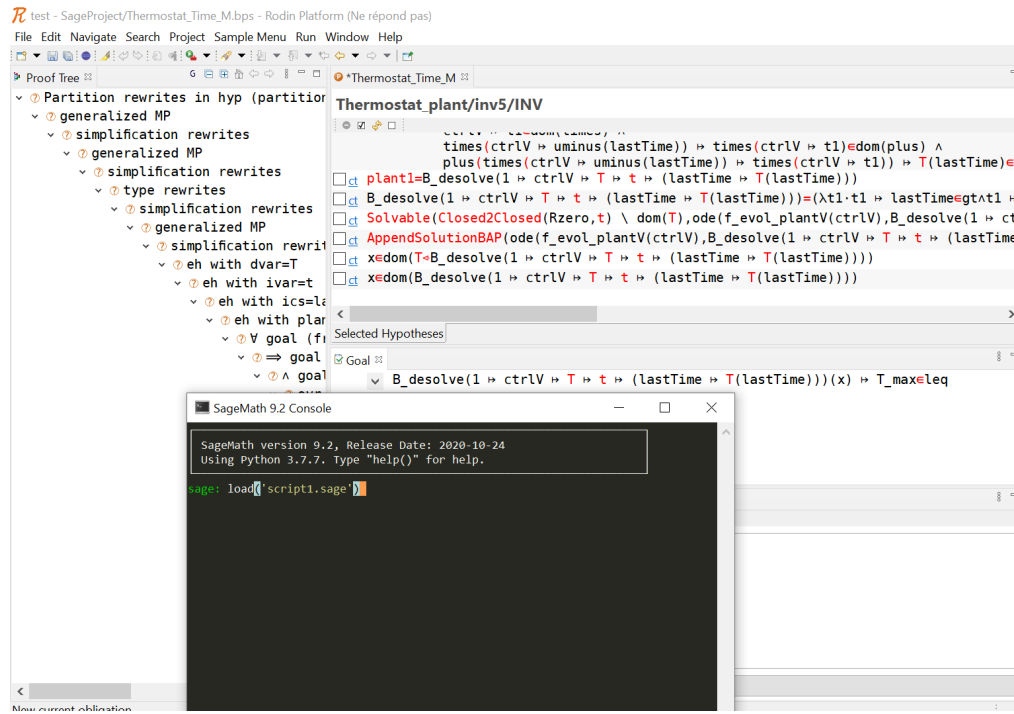


Figure E.8: Using plugin SAGEMATH: Step 8.