

OpenModelica Eclipse Setup

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2013-10-09

Important notices

- Make sure you use paths with no spaces
 - For Eclipse workspace
 - For OpenModelica project
- Make sure your Eclipse is not running until the slide which tells you to start Eclipse
- If you want omc to include the revision number in the omc version install TortoiseSVN command line svn client and put it in your path

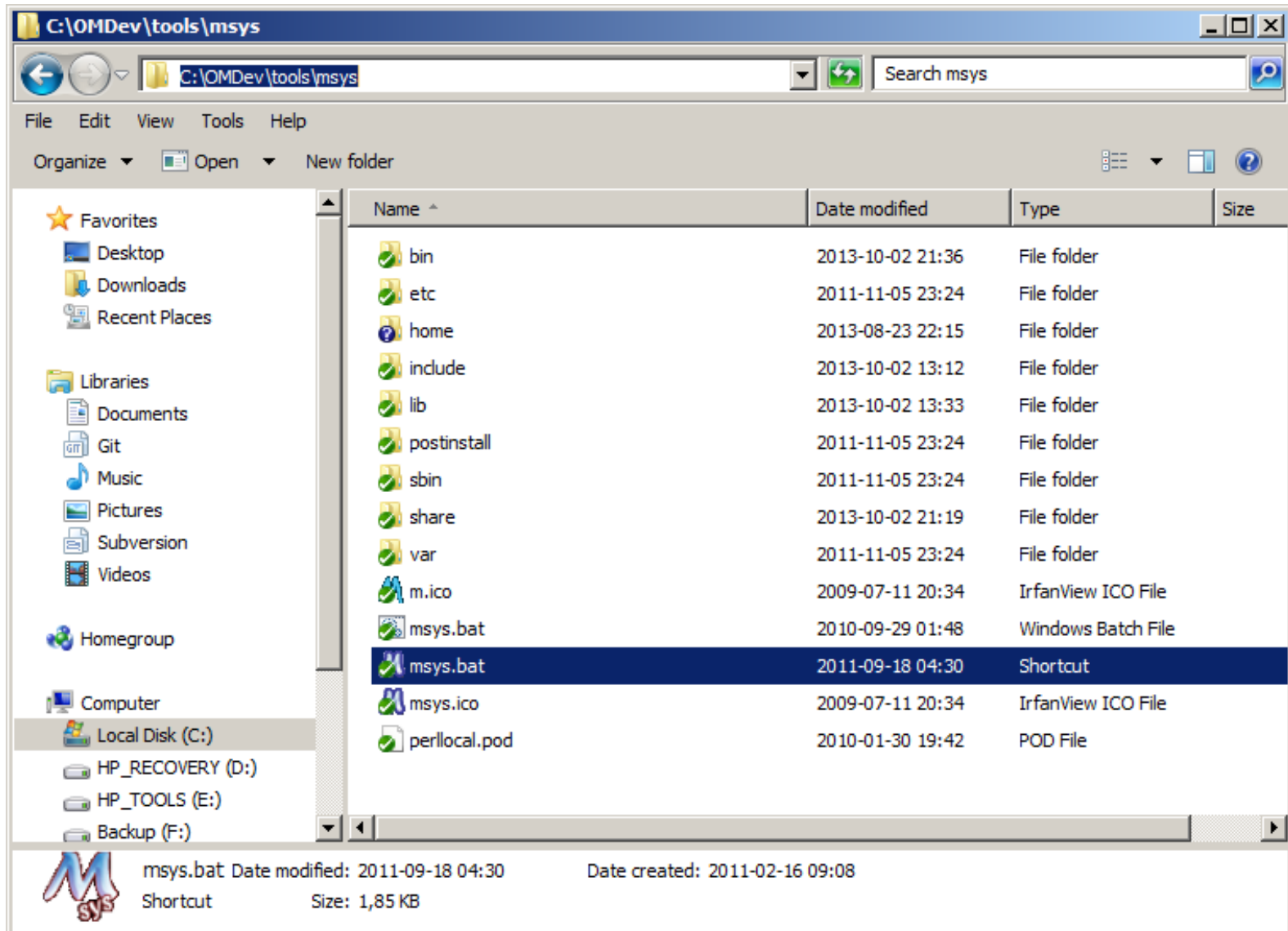
Checkout OMDev into C:\OMDev

- OMDev url:

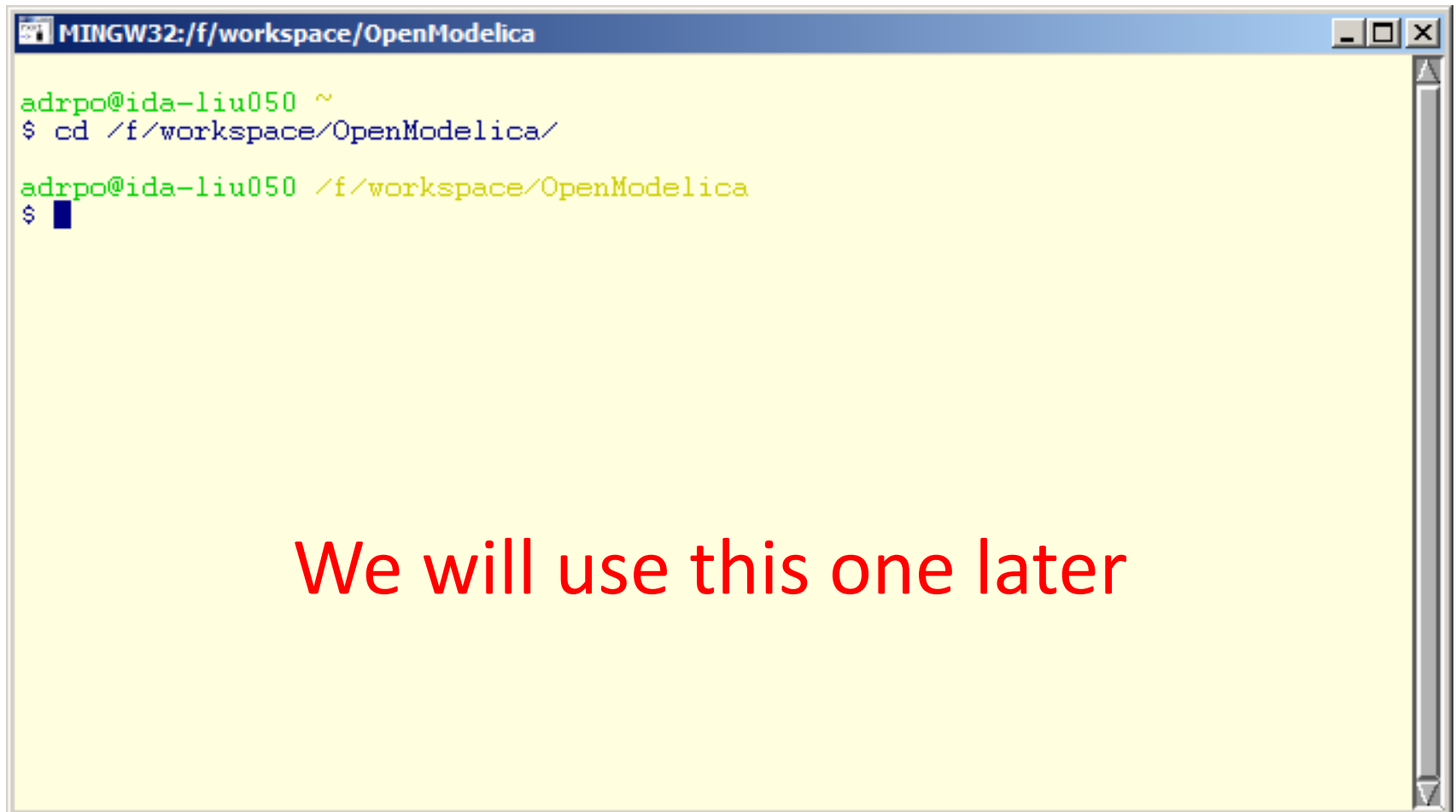
<https://openmodelica.org/svn/OpenModelica/installers/windows/OMDev>

- Add OMDEV environment variable pointing to C:\OMDev
- JDK 32bit needs to be installed and Msys should be able to find it! Put it in your PATH environment variable.

Msys location – use the shortcut



Msys – a Linux like terminal

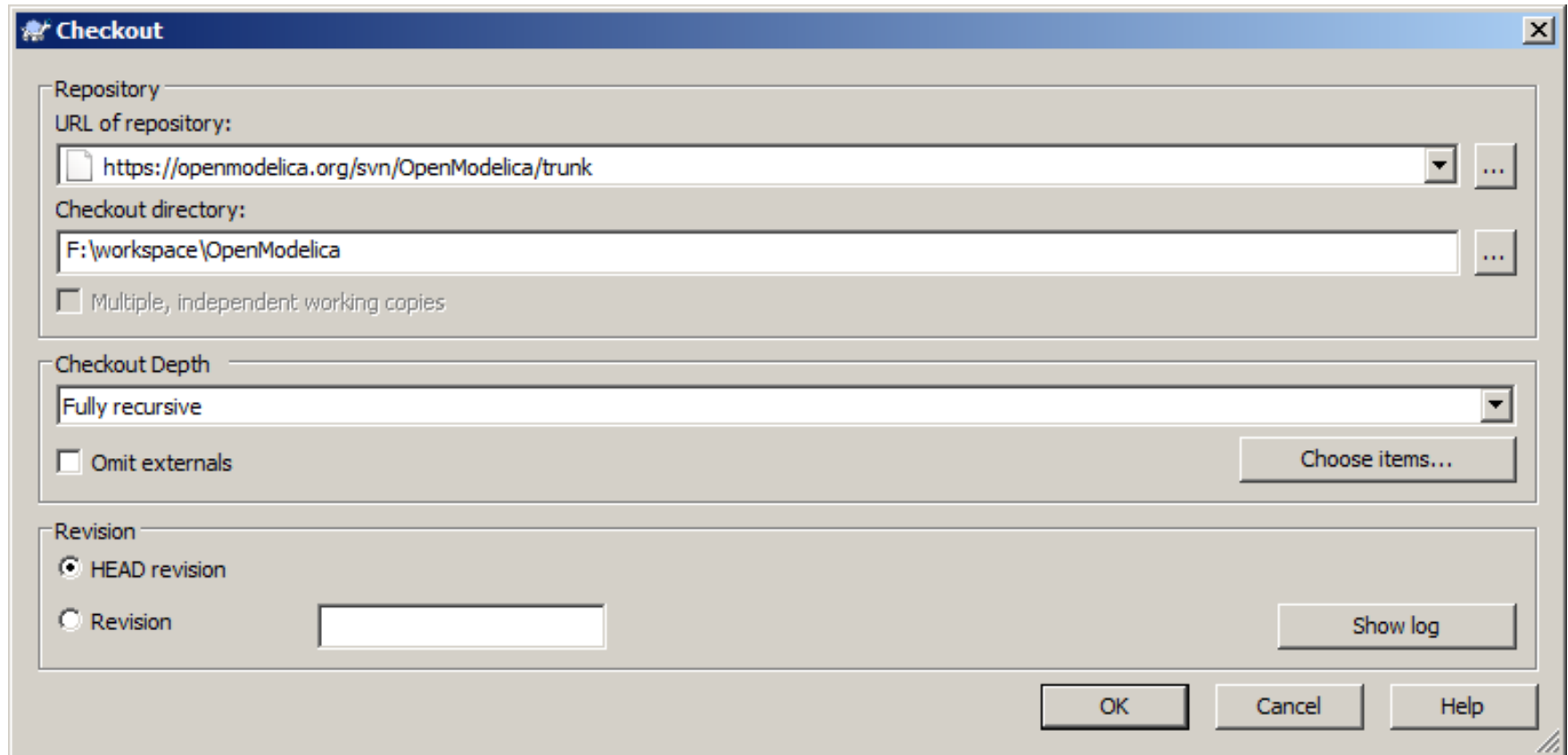


The image shows a screenshot of a MINGW32 terminal window. The title bar at the top reads "MINGW32:/f/workspace/OpenModelica". The terminal content shows a user named "adrpo" at a host "ida-liu050" with a tilde "~" as the home directory. The user enters the command "\$ cd /f/workspace/OpenModelica/" and the prompt changes to "adrpo@ida-liu050 /f/workspace/OpenModelica". The user then enters a dollar sign "\$" followed by a cursor, indicating the next command.

```
MINGW32:/f/workspace/OpenModelica  
adrpo@ida-liu050 ~  
$ cd /f/workspace/OpenModelica/  
adrpo@ida-liu050 /f/workspace/OpenModelica  
$
```

We will use this one later

Checkout OpenModelica

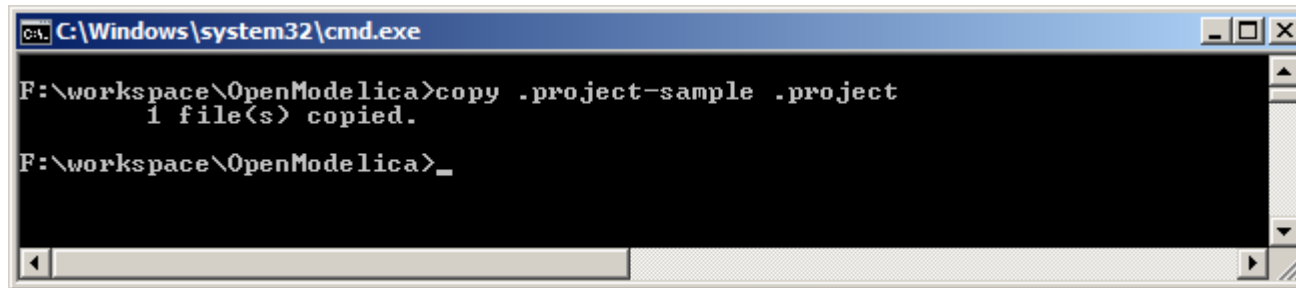


The screenshot shows a 'Checkout' dialog box with the following fields and options:

- Repository**
 - URL of repository:
 - Checkout directory:
 - ☐ Multiple, independent working copies
- Checkout Depth**
 -
 - ☐ Omit externals
- Revision**
 - ☒ HEAD revision
 - ☐ Revision

Buttons at the bottom:

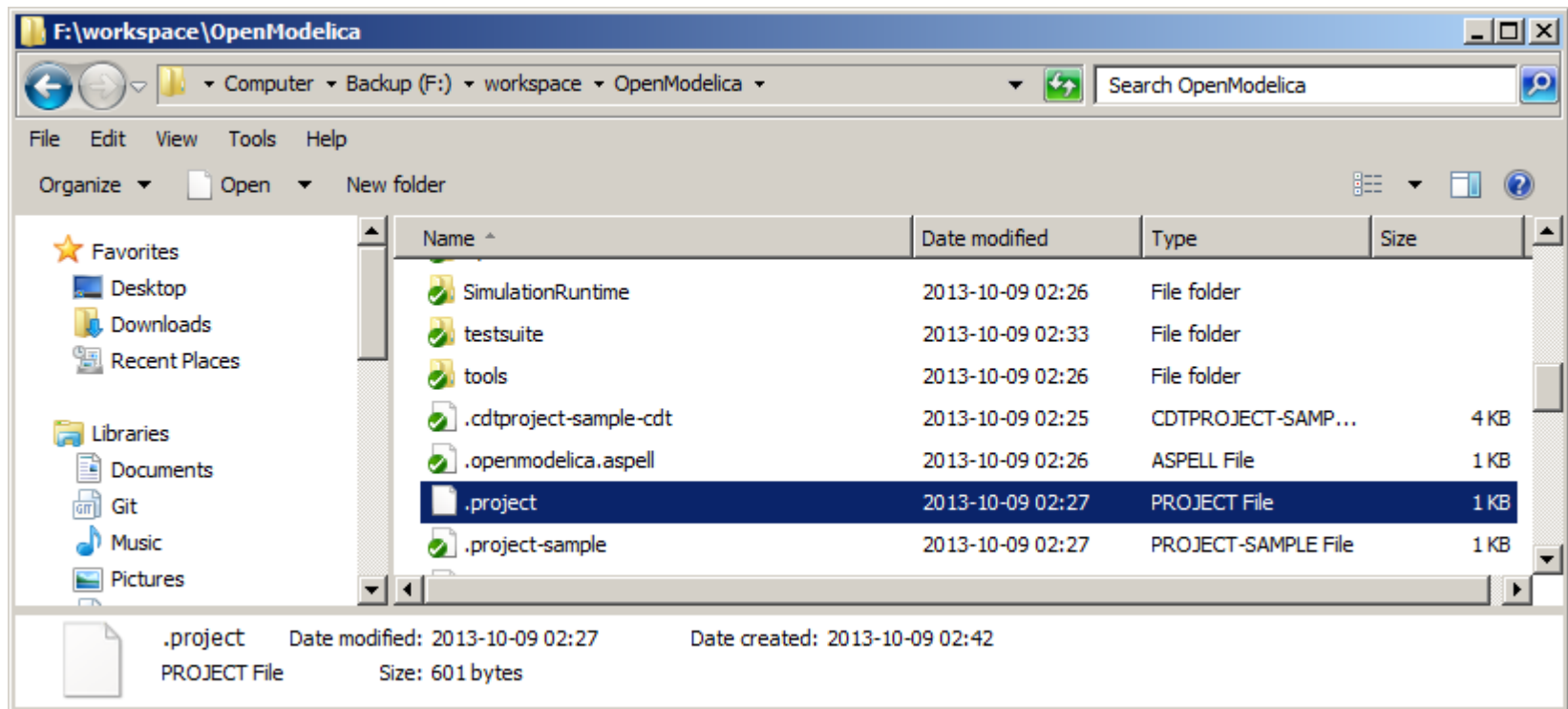
Copy .project-sample to .project



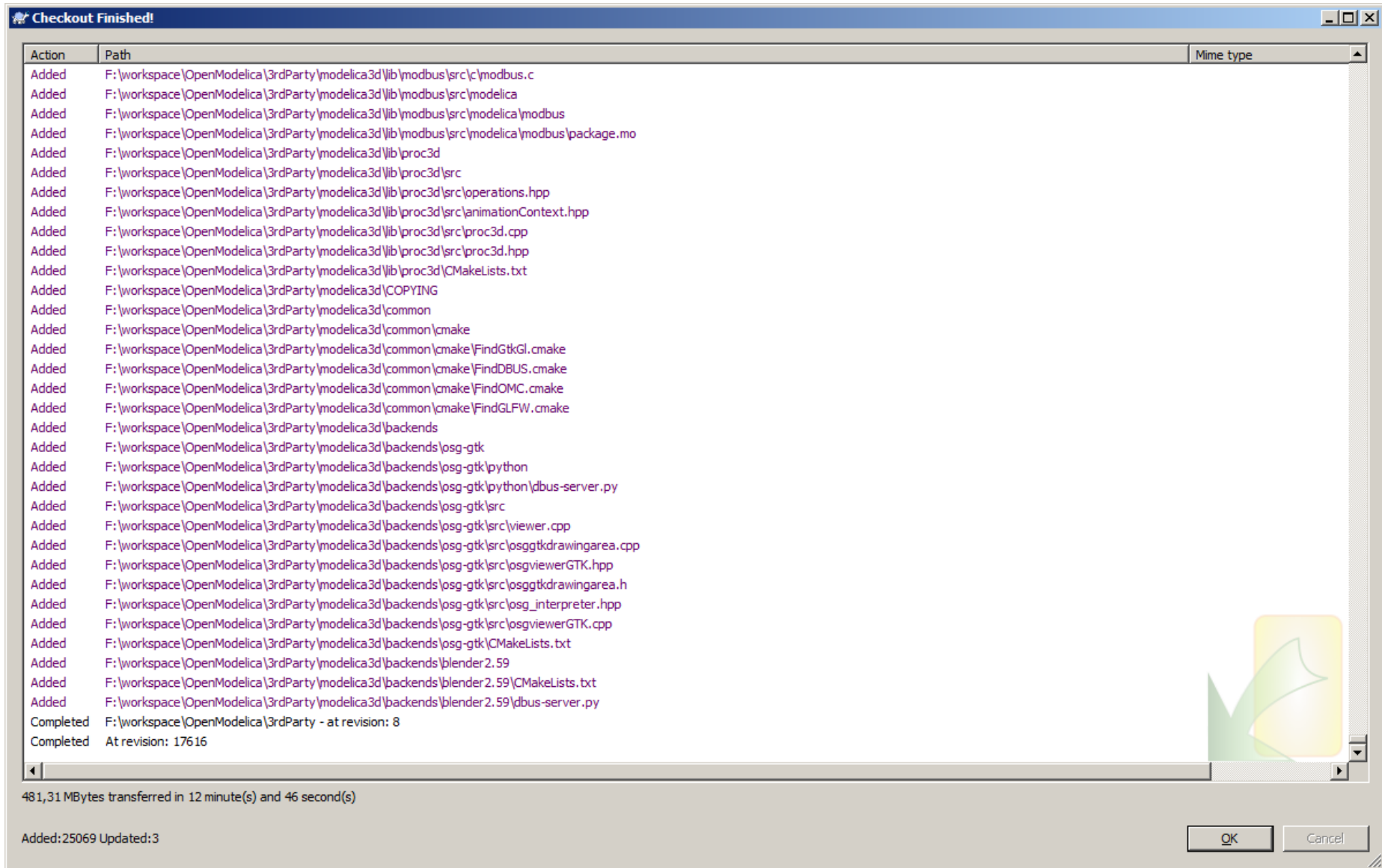
```
C:\Windows\system32\cmd.exe

F:\workspace\OpenModelica>copy .project-sample .project
        1 file(s) copied.

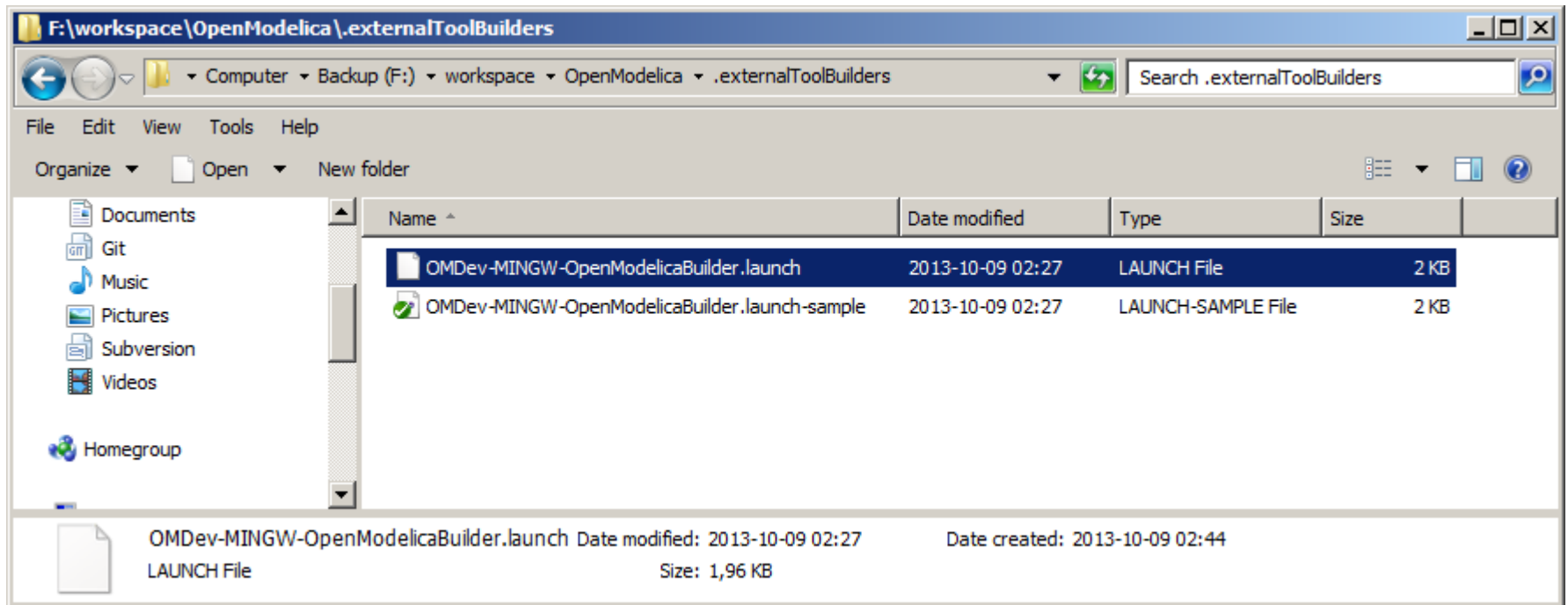
F:\workspace\OpenModelica>_
```



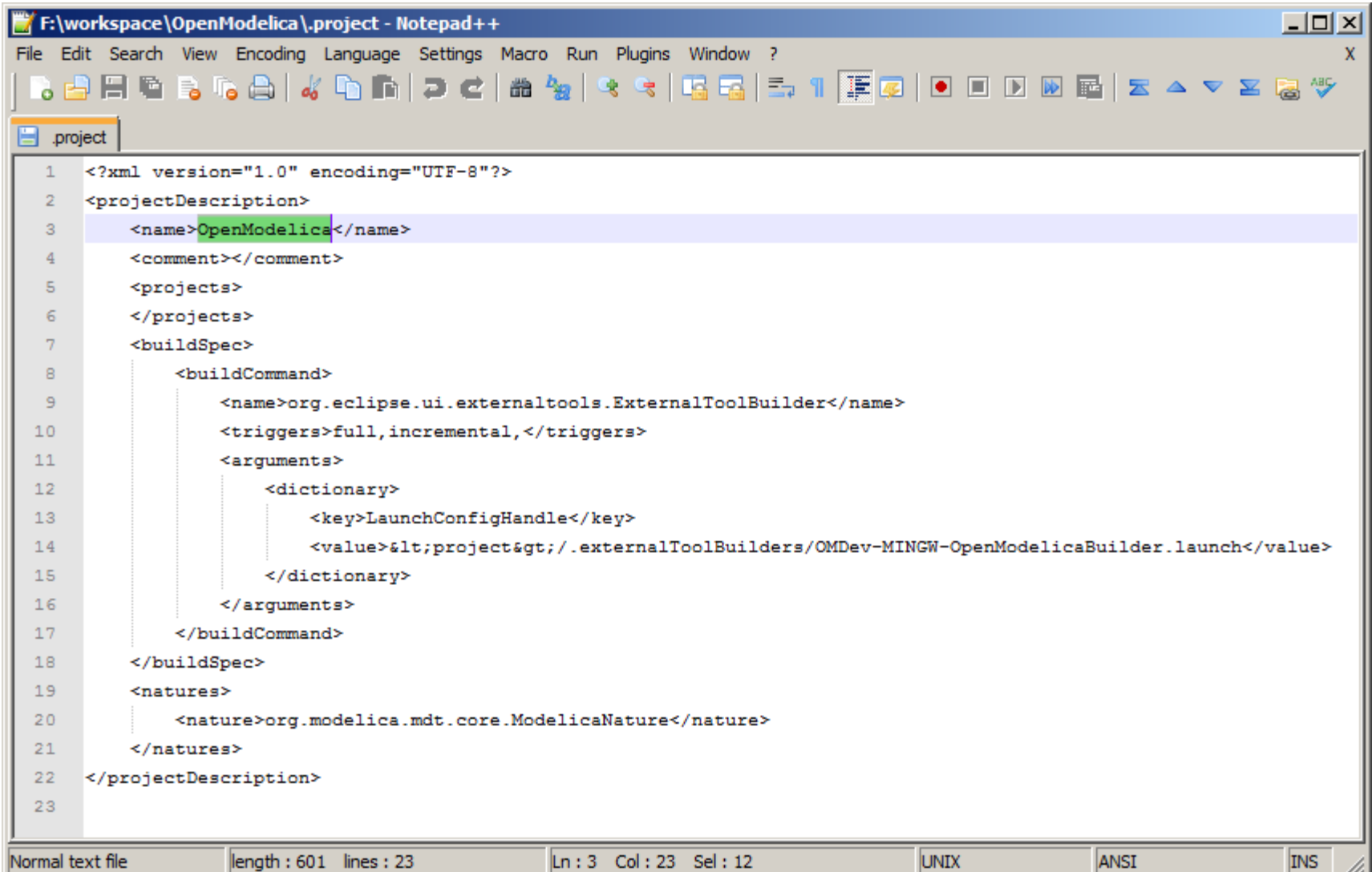
Checkout OpenModelica - done



Copy OMDev-MINGW-OpenModelicaBuilder.launch-sample
to
OMDev-MINGW-OpenModelicaBuilder.launch
in workspace\OpenModelica\.externalToolBuilders

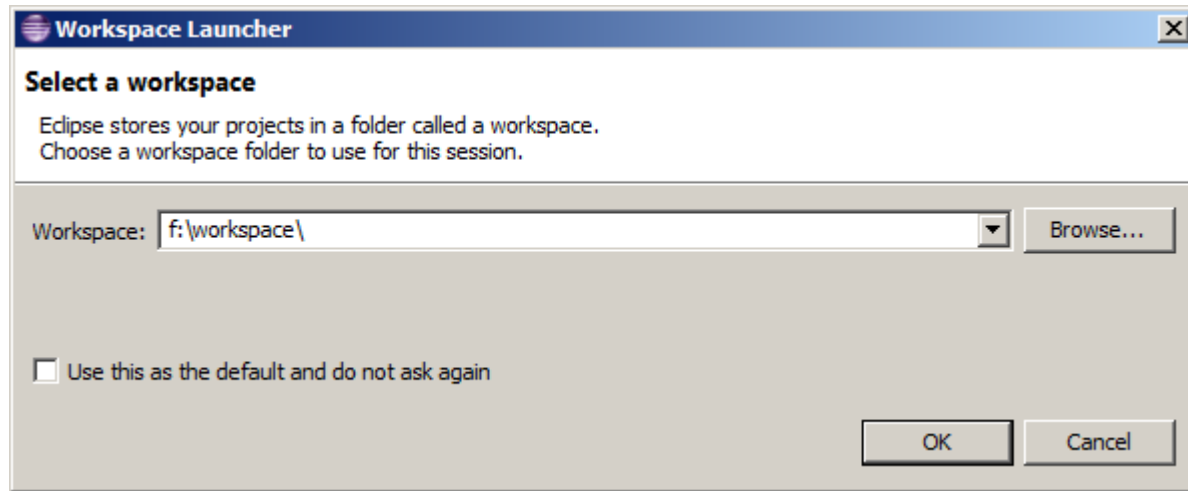


If your project is not named OpenModelica change it in .project



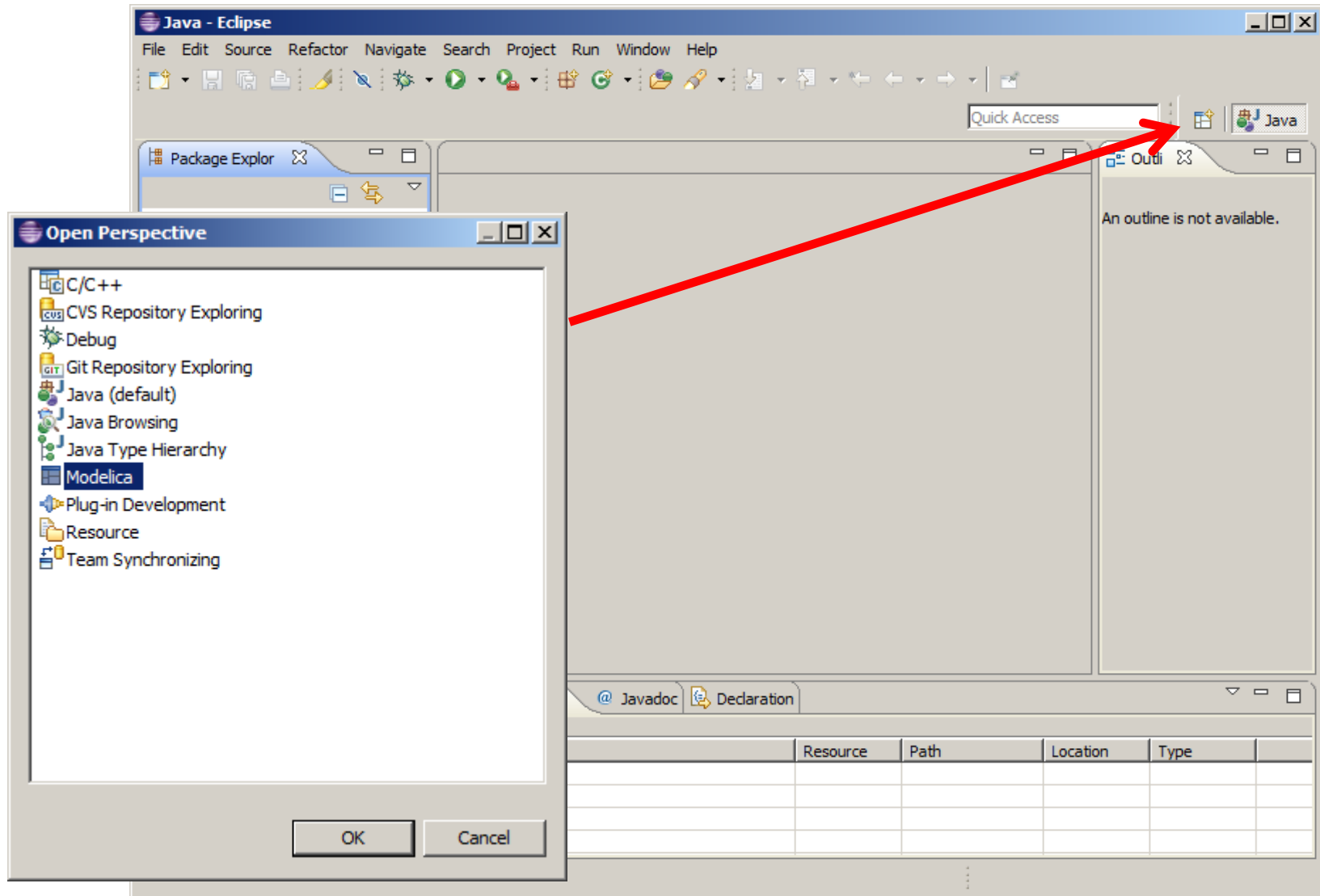
```
F:\workspace\OpenModelica\.project - Notepad++
File Edit Search View Encoding Language Settings Macro Run Plugins Window ?
X
.project
1 <?xml version="1.0" encoding="UTF-8"?>
2 <projectDescription>
3   <name>OpenModelica</name>
4   <comment></comment>
5   <projects>
6   </projects>
7   <buildSpec>
8     <buildCommand>
9       <name>org.eclipse.ui.externaltools.ExternalToolBuilder</name>
10      <triggers>full,incremental,</triggers>
11      <arguments>
12        <dictionary>
13          <key>LaunchConfigHandle</key>
14          <value>&lt;project&gt;/.externalToolBuilders/OMDev-MINGW-OpenModelicaBuilder.launch</value>
15        </dictionary>
16      </arguments>
17    </buildCommand>
18  </buildSpec>
19  <natures>
20    <nature>org.modelica.mdt.core.ModelicaNature</nature>
21  </natures>
22 </projectDescription>
23
Normal text file    length : 601 lines : 23    Ln : 3 Col : 23 Sel : 12    UNIX    ANSI    INS
```

Start Eclipse

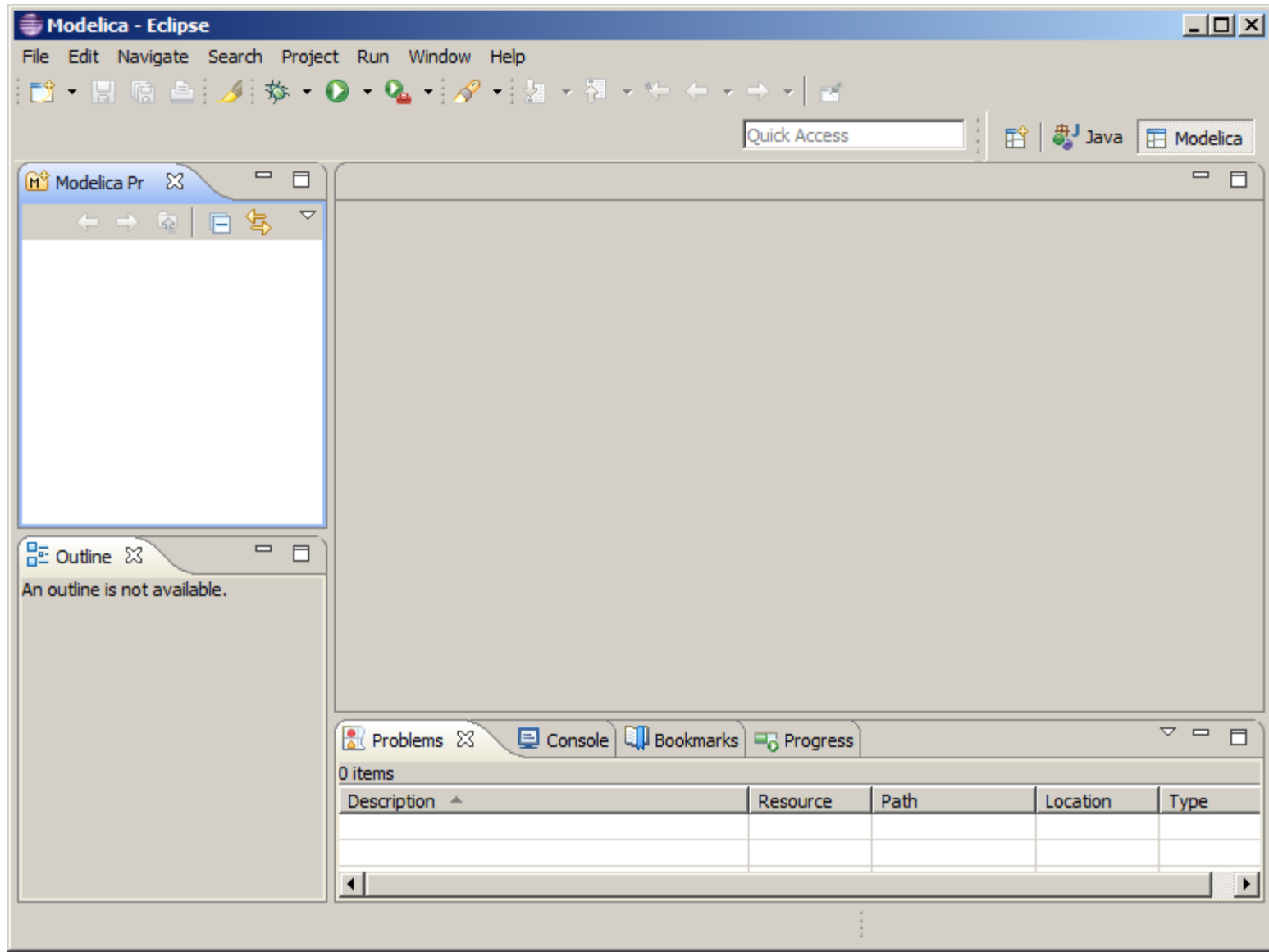


Install MDT in Eclipse if you haven't done that yet:
<https://trac.openmodelica.org/documents/MDT/install/>

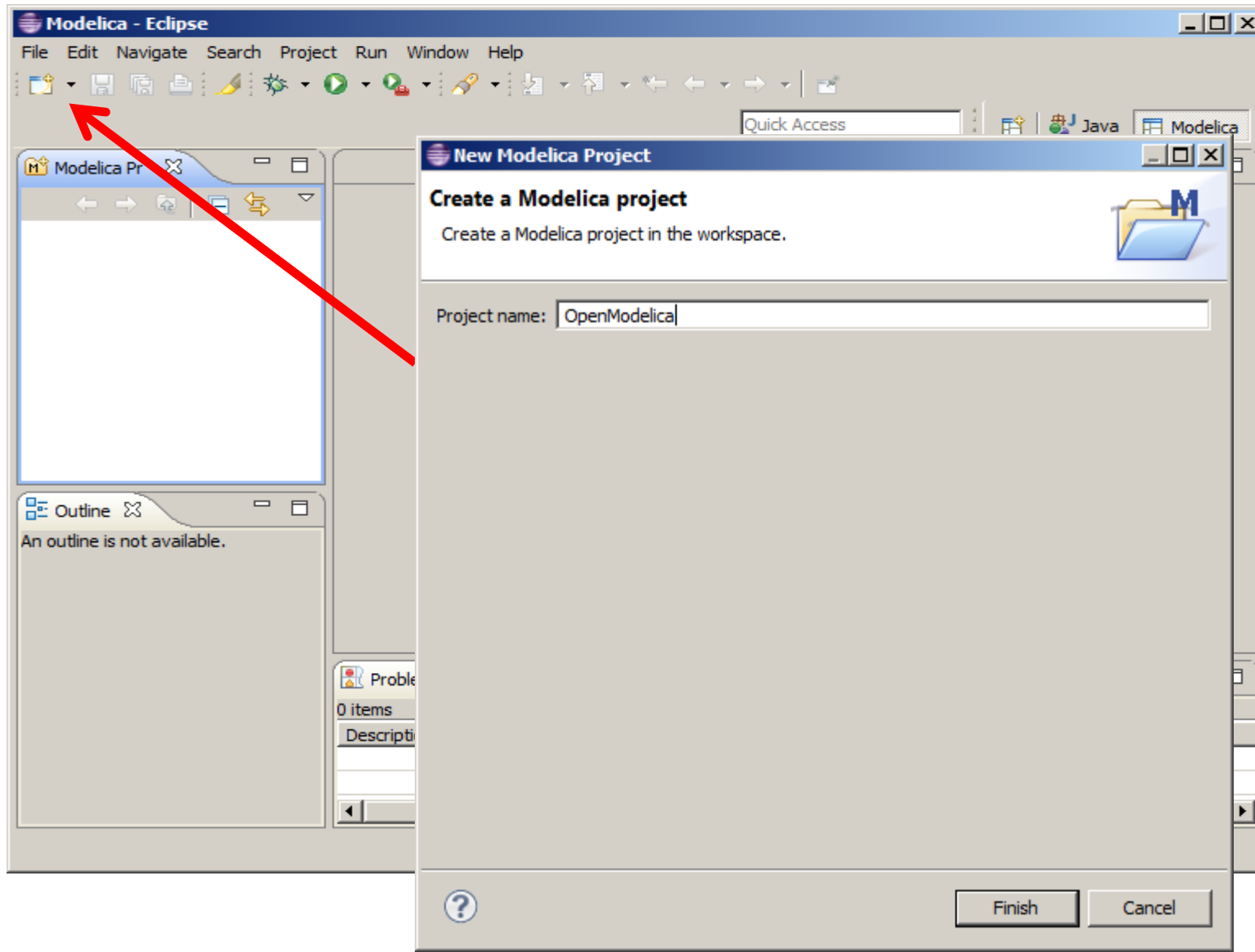
Switch to Modelica perspective



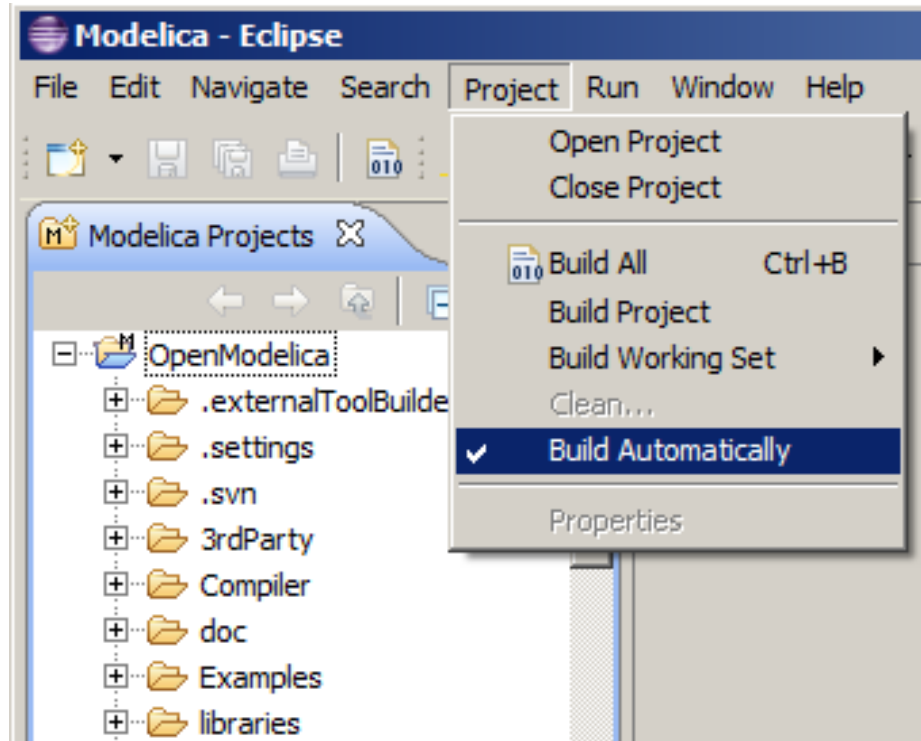
Modelica perspective



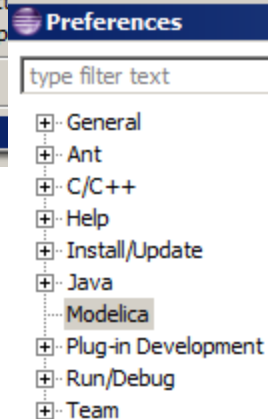
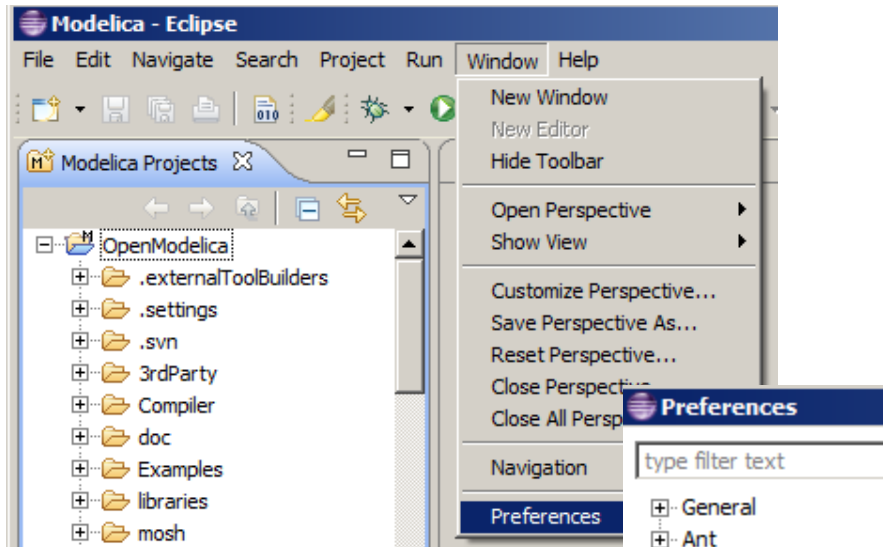
New Modelica project named OpenModelica (or the name you chose)



Remove Build automatically from Project



Add +g=MetaModelica to omc flags



Modelica

Settings for Modelica development:

General Settings

☒ Use OpenModelica Compiler (OMC) from Modelica Development Tooling (MDT)

If you disable the use of OMC:

- the MDT code assist functionality will not work.
- the outline for Modelica files will not work.
- the MDT console will not work.
- the status bar will display 'Empty Compiler is Online'.
- the editing will be much more responsive.

You need to restart Eclipse if you enable/disable OMC.

Error reporting settings

☐ Display internal compatibility errors

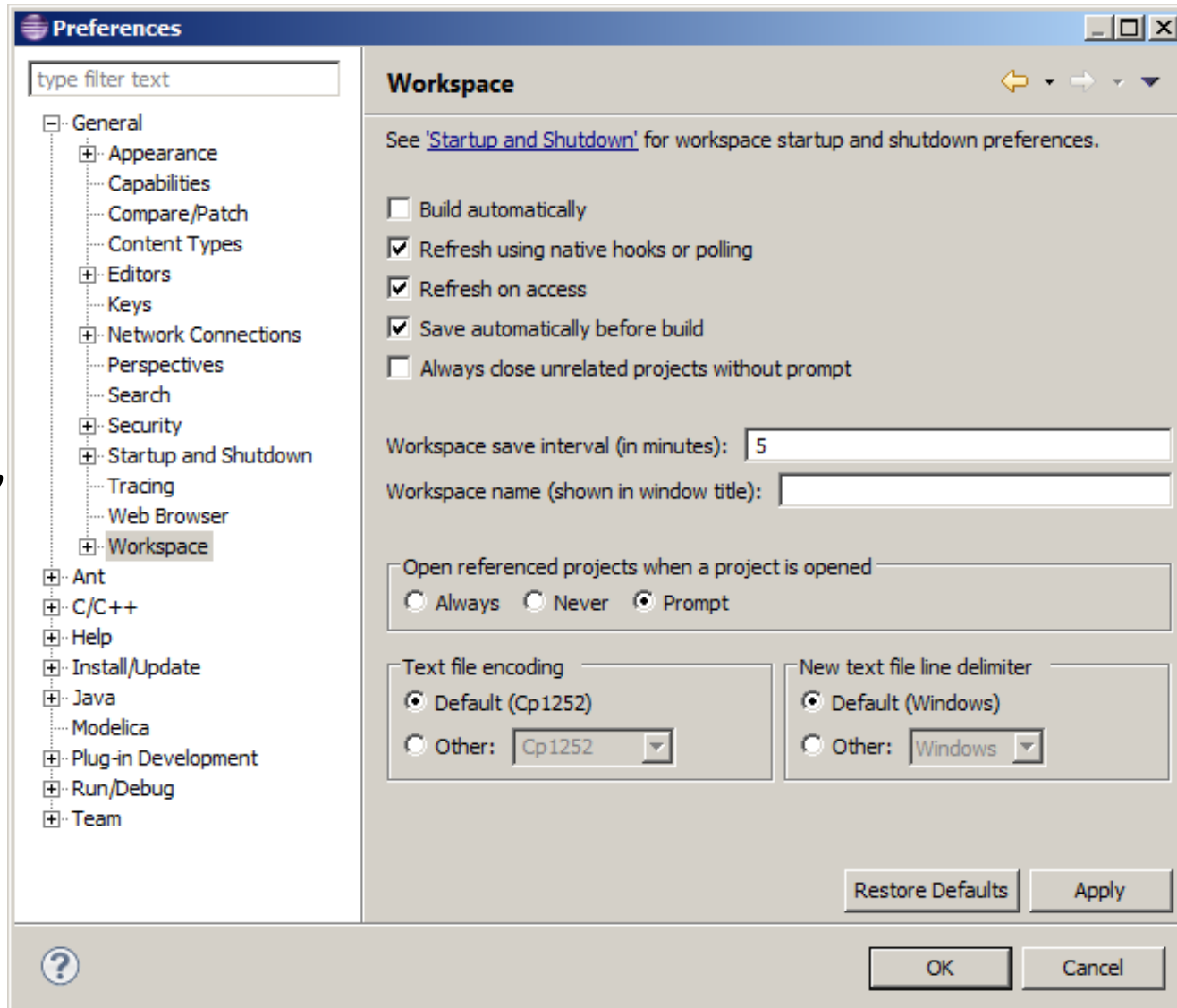
OMC command line parameters

+g=MetaModelica

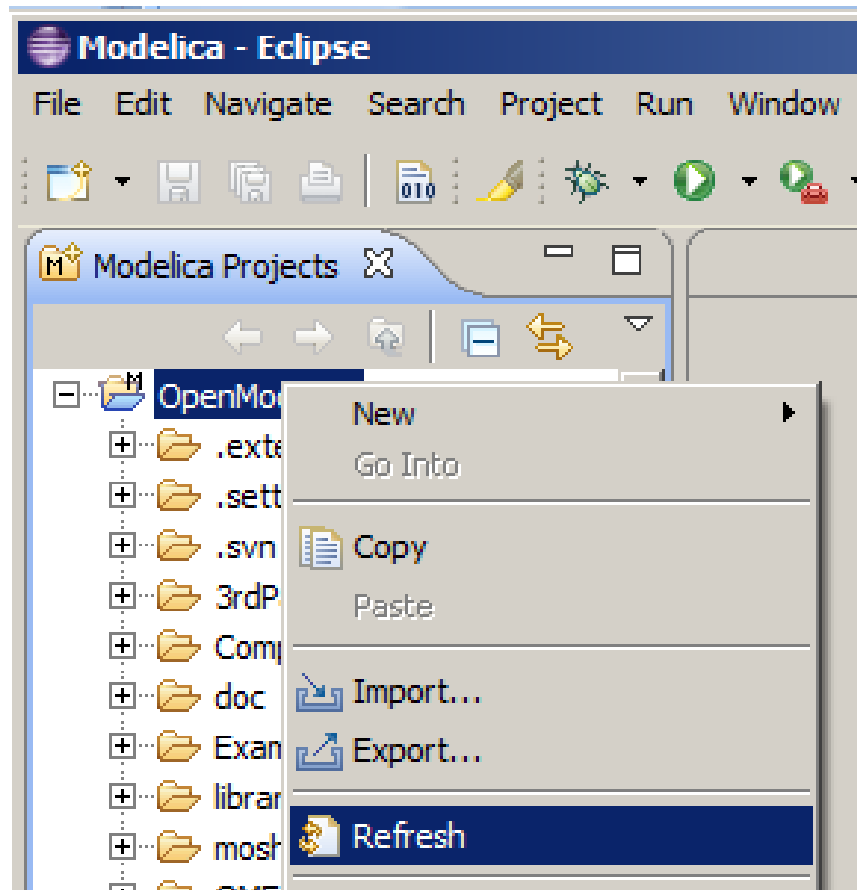
**RESTART ECLIPSE
AFTER THIS CHANGE**

Important notice

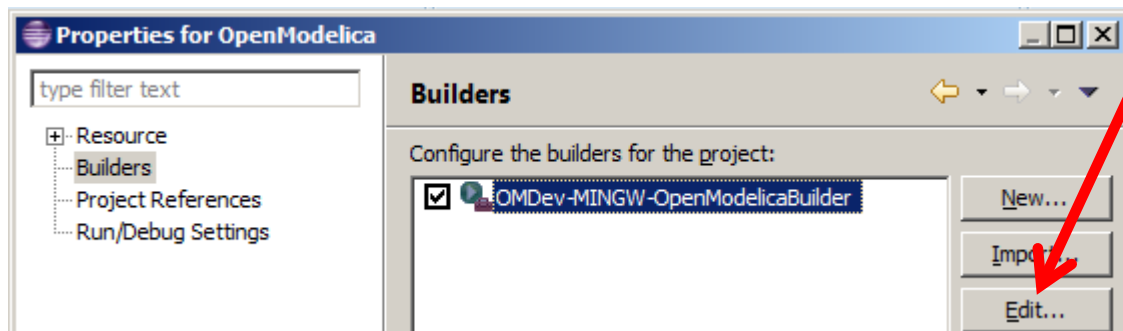
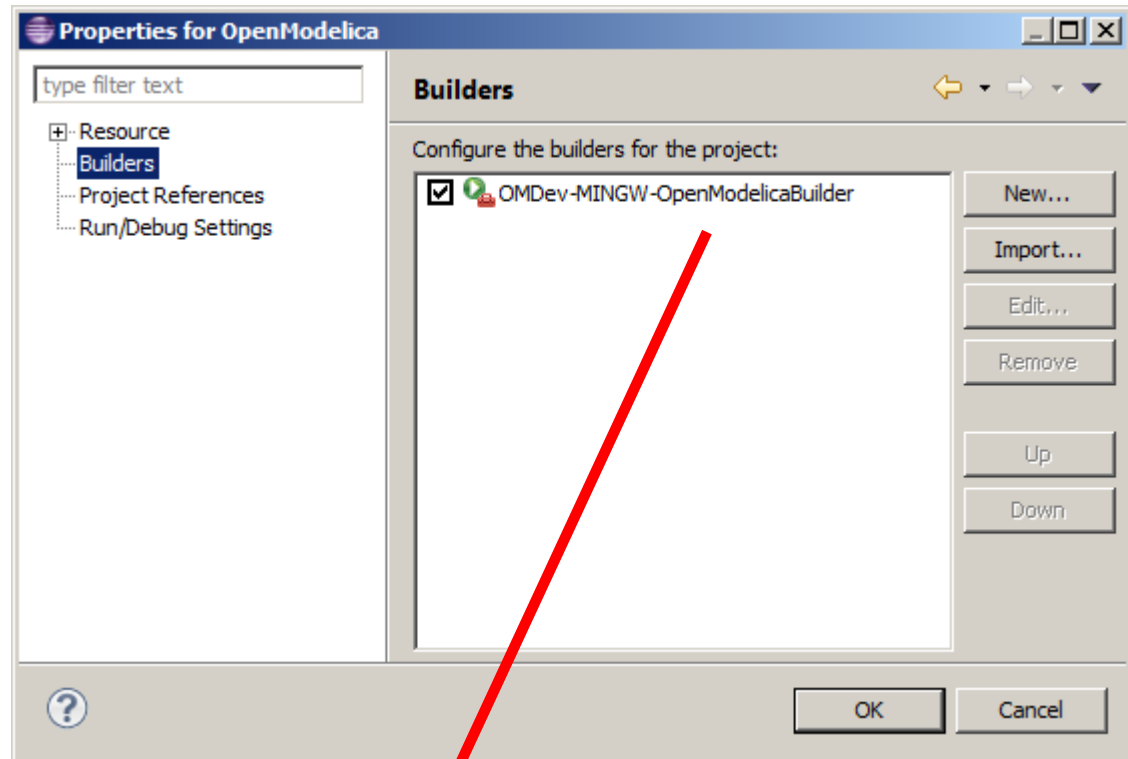
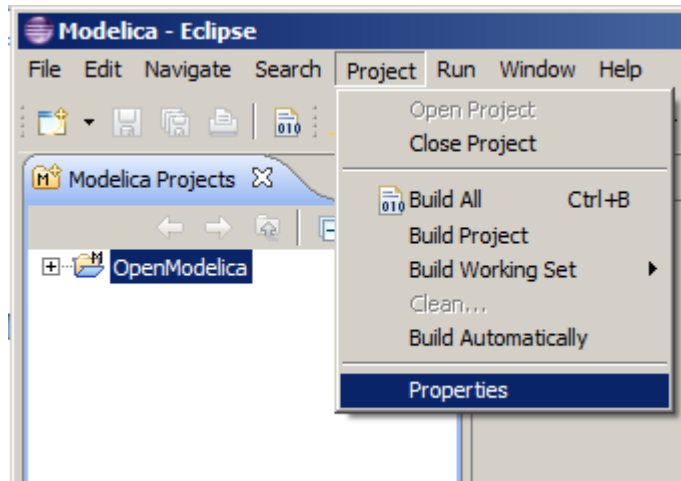
- In Eclipse is best to do refresh on a workspace automatically, via
- Window-> Preferences



Refresh project, right click->Refresh



Check settings in Project builder



Check settings in all tabs!

Edit Configuration

Edit launch configuration properties

Create a configuration that will run a program during builds

Name: OMDev-MINGW-OpenModelicaBuilder

Main Refresh Environment Build Options

Location: `$(env_var:OMDEV)\tools\msys\bin\make.exe`

Browse Workspace... Browse File System... Variables...

Working Directory: `$(project_loc)`

Browse Workspace... Browse File System... Variables...

Arguments: `-f Makefile.omdev.mingw ${string_prompt}`

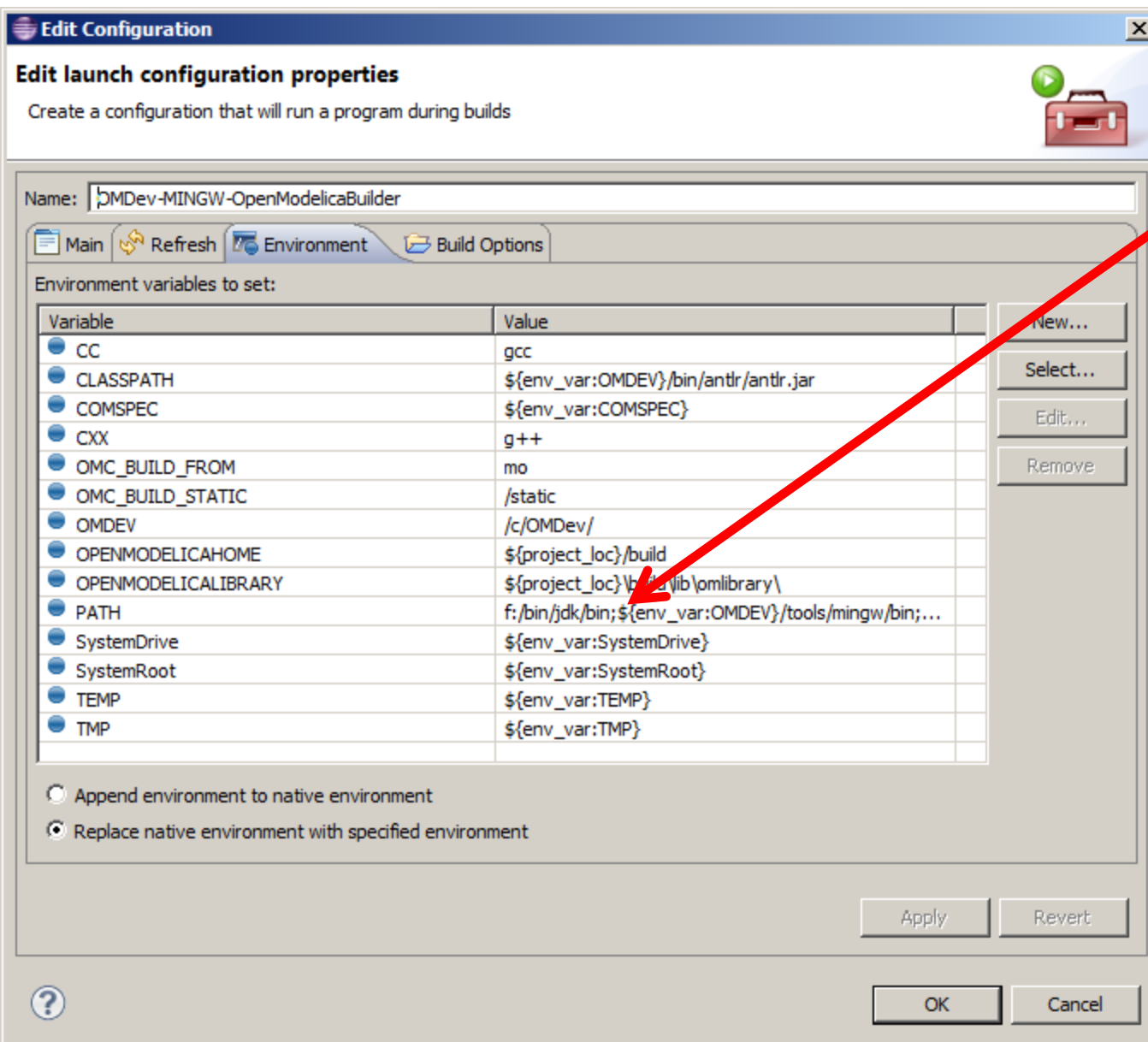
Variables...

Note: Enclose an argument containing spaces using double-quotes (").

Apply Revert

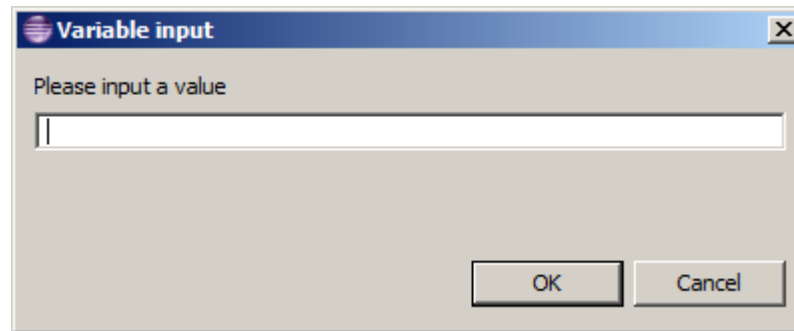
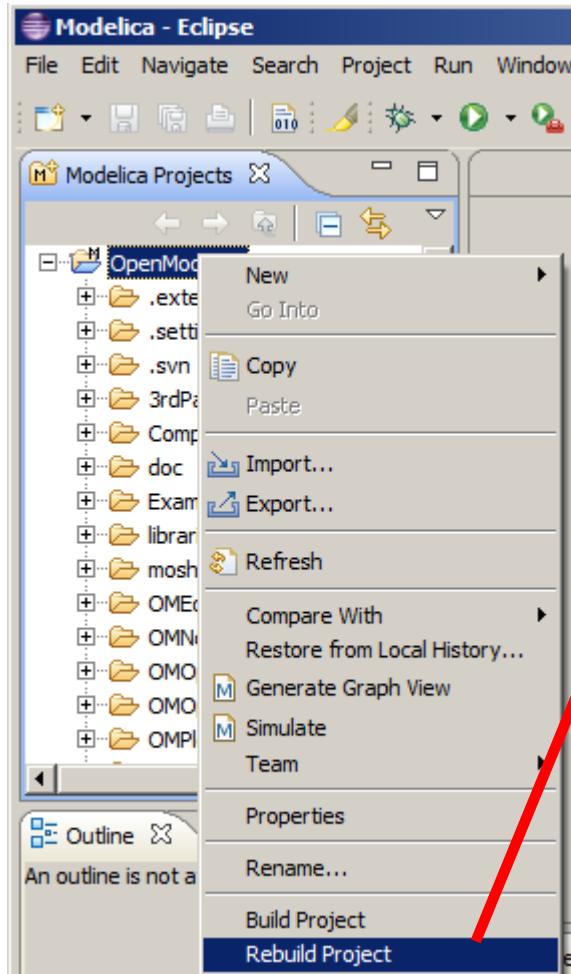
OK Cancel

Check settings in all tabs!



Make sure
jdk 32 bit
is in your
PATH

Build Project

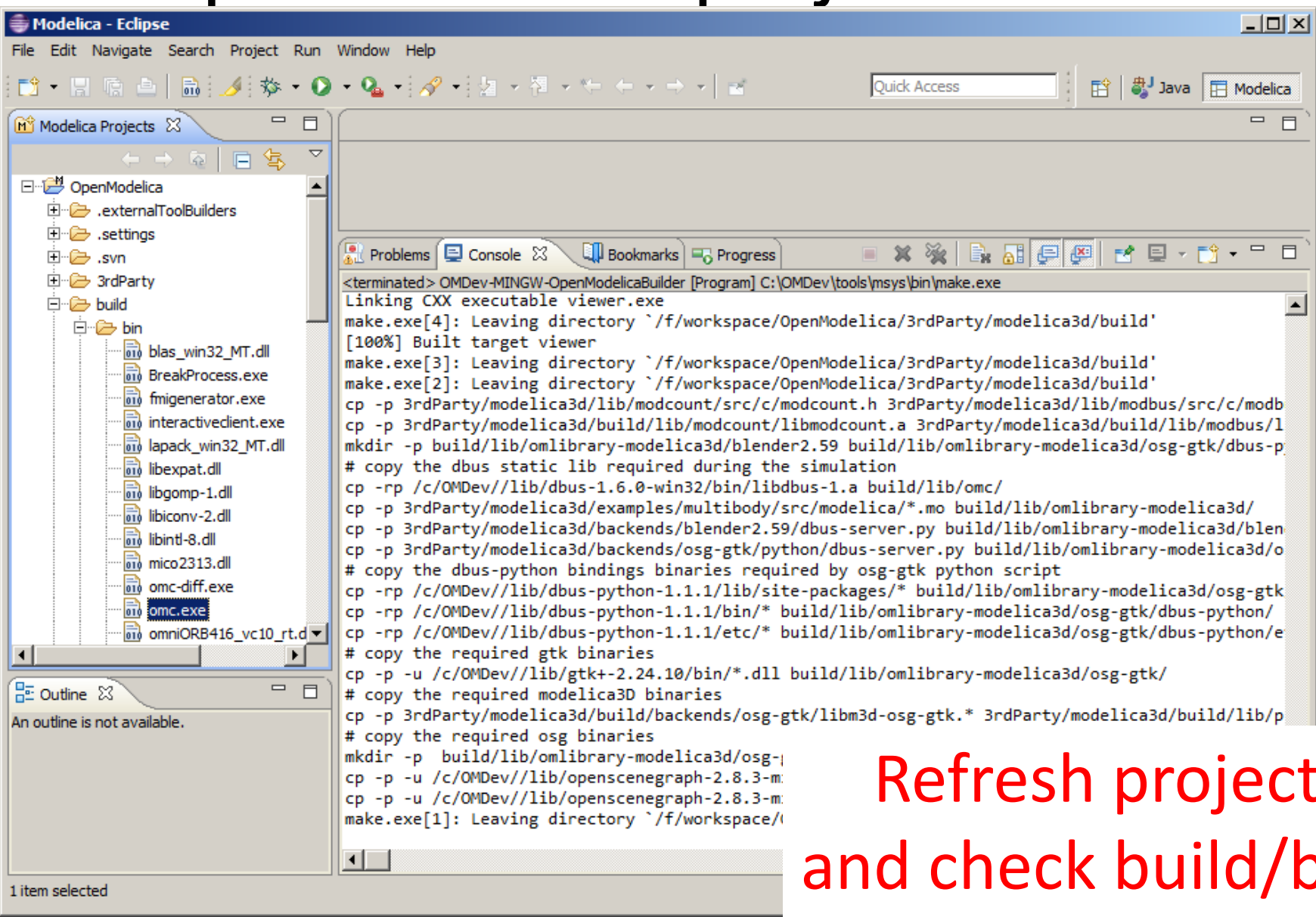


Leave empty and
click OK to build omc

.....

It does take a while.
Check the builder settings
if there are errors

OpenModelica project was build



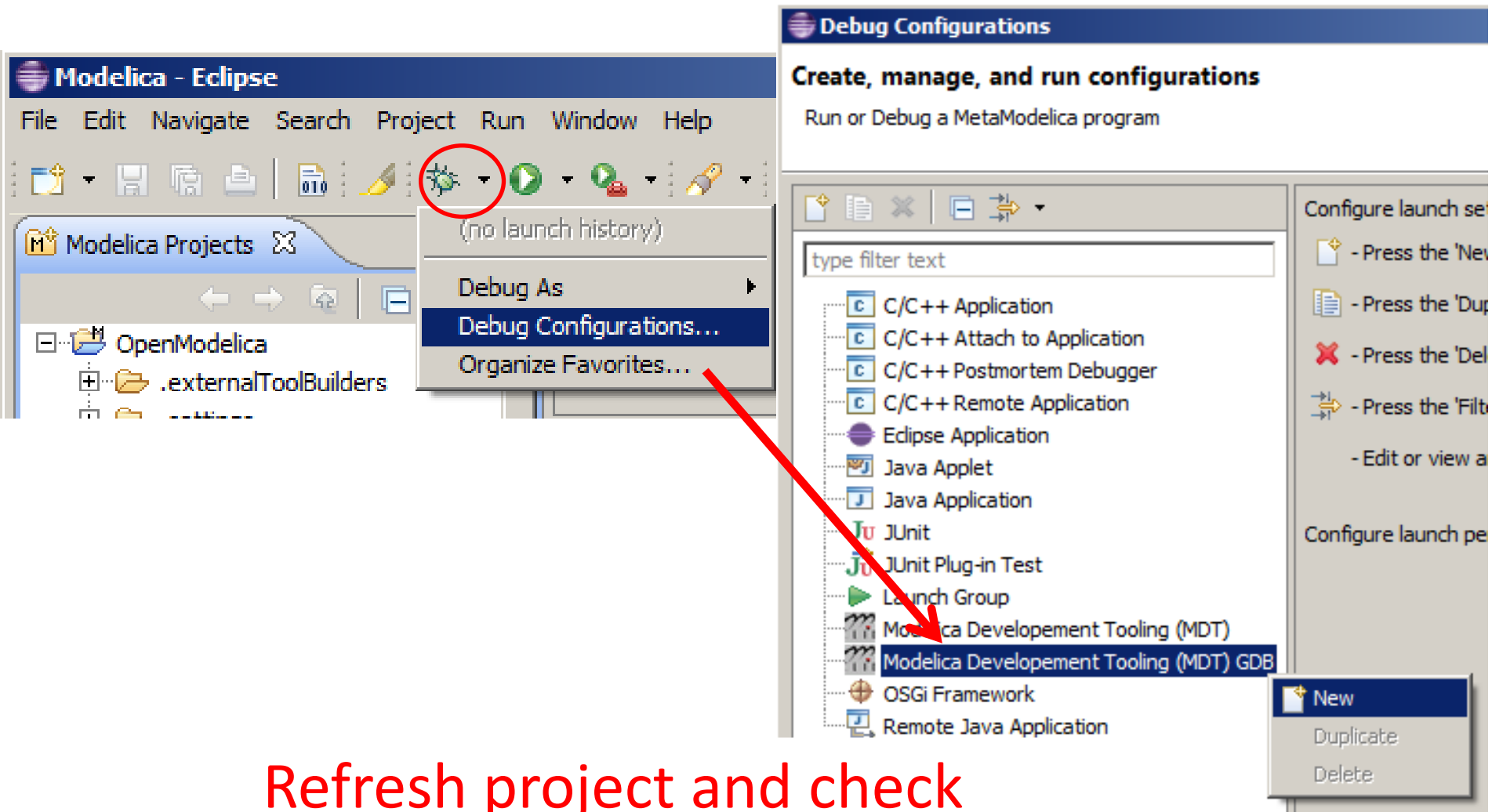
Refresh project
and check build/bin/

Build the bootstrapped compiler

```
MINGW32:/f/workspace/OpenModelica/testsuite/openmodelica/bootstrapping
adrpo@ida-liu050 ~
$ cd /f/workspace/OpenModelica/
adrpo@ida-liu050 /f/workspace/OpenModelica
$ cd testsuite/openmodelica/bootstrapping/
adrpo@ida-liu050 /f/workspace/OpenModelica/testsuite/openmodelica/bootstrapping
$ time make -f LinkMain.makefile.mingw build all
time ../../../../build/bin/omc +locale=C MainTest.mos
"true
true
"
"
true
true
"
true
"
real    1m59.264s
user    0m0.000s
sys      0m0.015s
time gcc -c -o Main_main.o Main_main.c -I../../../../build/include/omc -g -O0 -falign-functions -static-libgcc
real    3m27.665s
user    0m0.000s
sys      0m0.000s
time gcc -I../../../../build/include/omc -g -O0 -falign-functions -static-libgcc -c -o main_records.o main_rec
ords.c
real    0m0.583s
user    0m0.015s
sys      0m0.000s
rm -f libmainrecords.a
ar -ru libmainrecords.a main_records.o
C:\OMDev\tools\mingw\bin\ar.exe: creating libmainrecords.a
ranlib libmainrecords.a
cp ../../../../build/bin/*.dll .
cp C:\OMDev\tools\mingw\bin\libgcc_s_dw2-1.dll .
gcc -o main_main.c Main_main.o -I../../../../build/include/omc -g -O0 -falign-functions -static-libgcc -L./ -L
../../../../build/lib/omc -L../../../../3rdParty/FMIL/install/lib -L../../../../Compiler/modpar/ -lomp
rtime -lOpenModelicaRuntimeC -lModelicaExternalC -lmodparomc -lm -lantlr3 -lmico2313 -lregex -lwsock32 -llp
solve55 -luuid -lole32 -lws2_32 -lRpcrt4 -llapack-mingw -ltmglib-mingw -lblas-mingw -lf2c -fopenmp -lgc -l
pthread -lstlcpp -lstdc++ -lstdc++ -lshlwapi -liconv -lntlm -Wl,--stack,16777216,--large-address-aware,--enable-st
dcall-fixup -lmainrecords
real    5m54.333s
user    0m0.152s
sys      0m0.260s
$
```

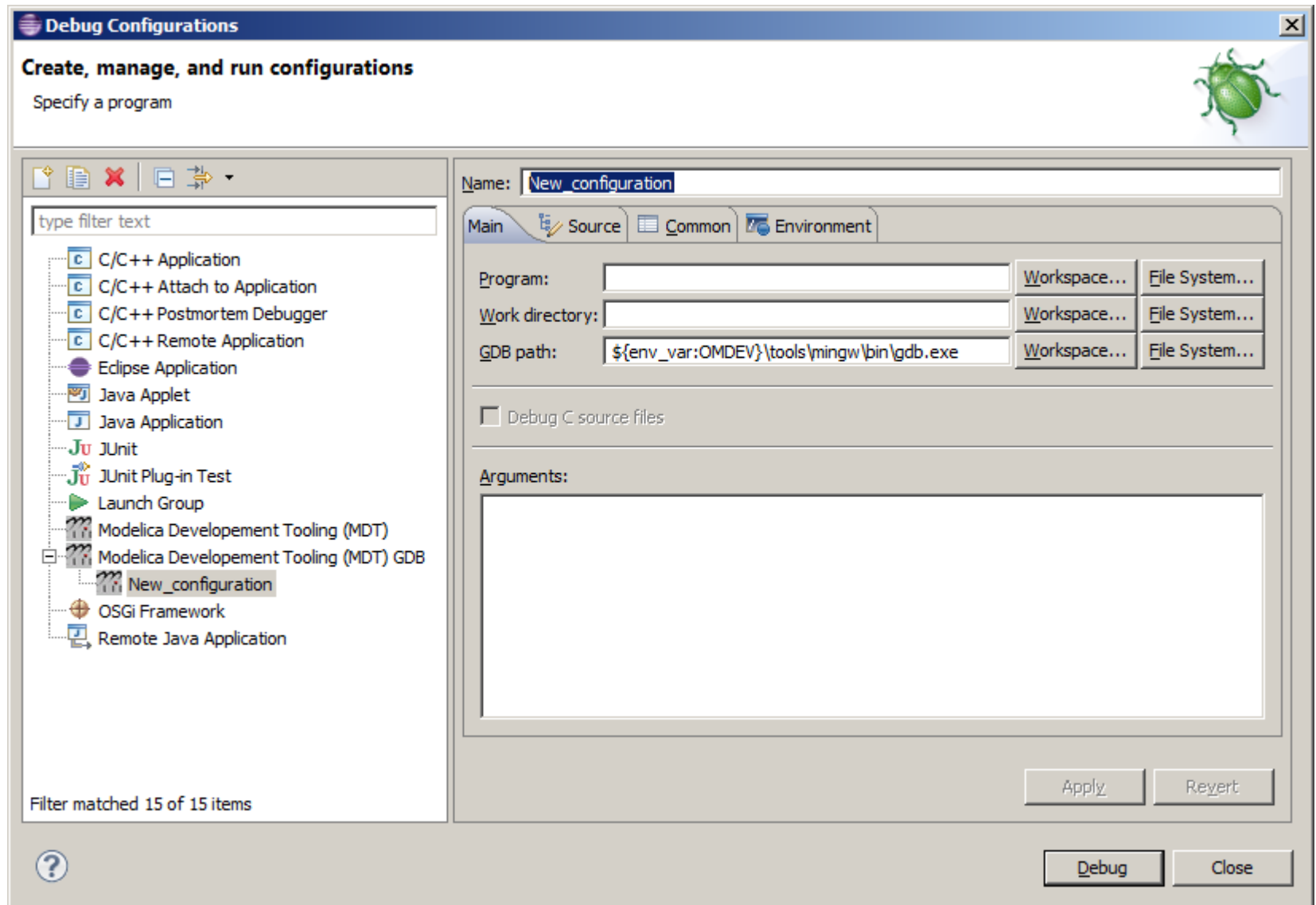
Use
Msys

Setup Eclipse Debugging

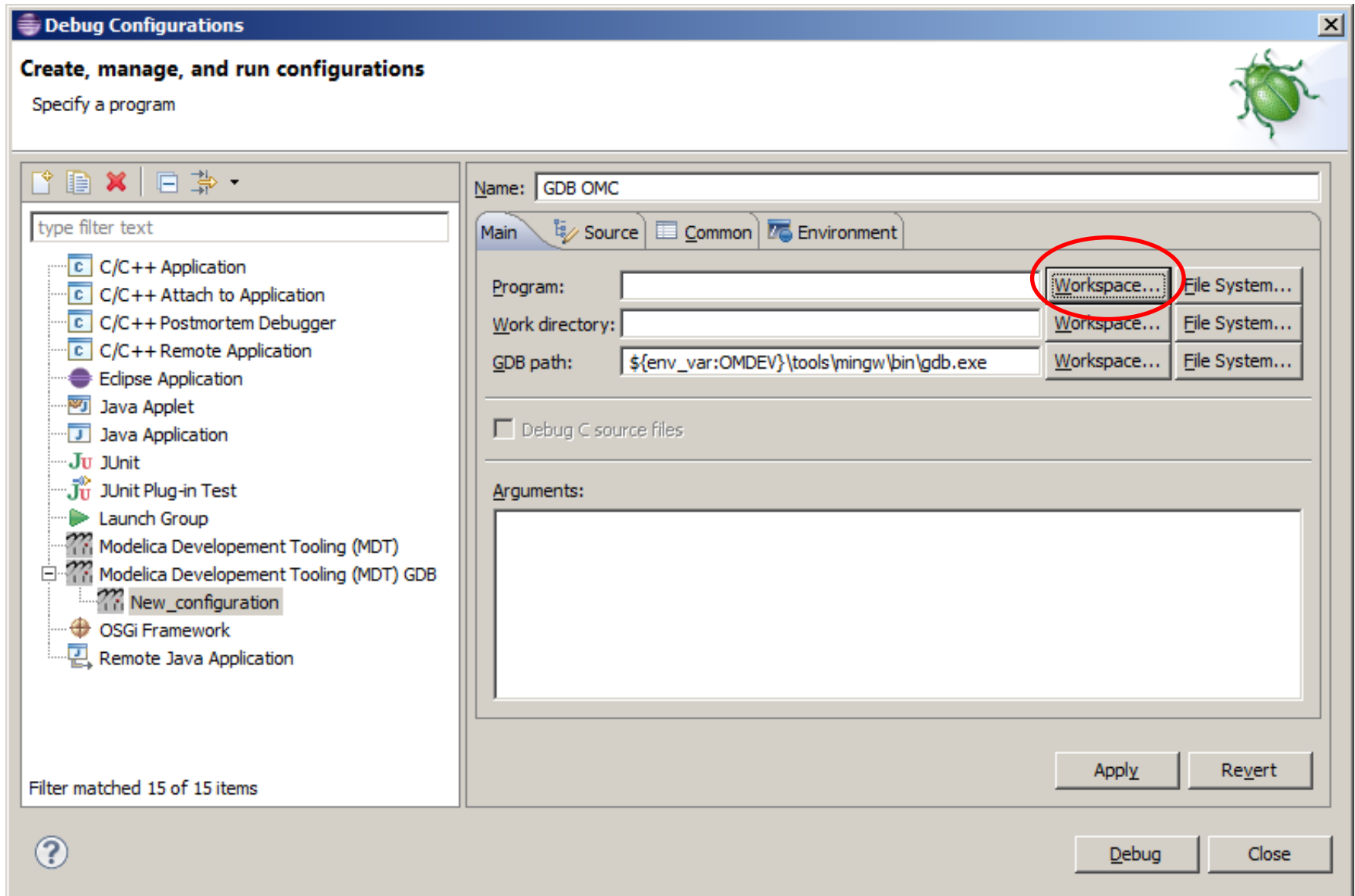


Refresh project and check
testsuite/openmodelica/bootstrapping

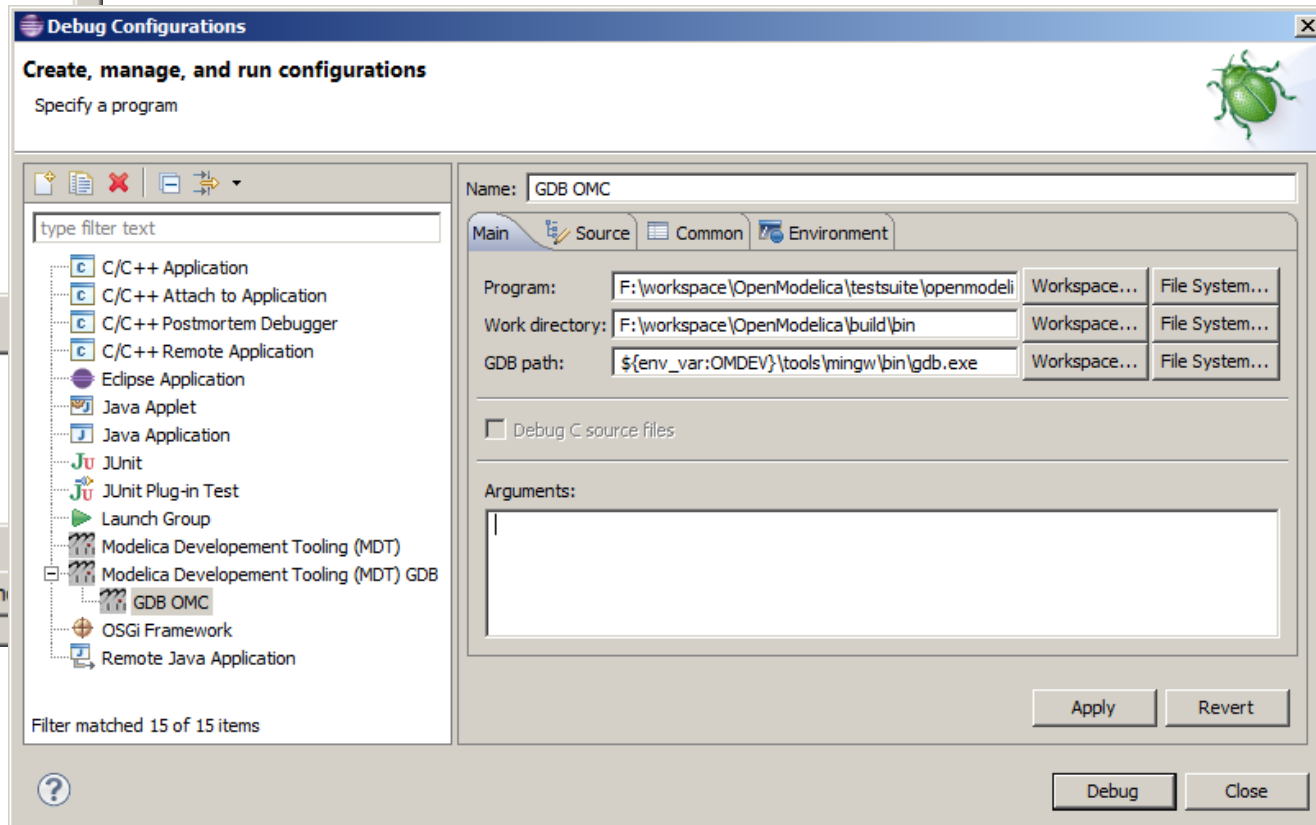
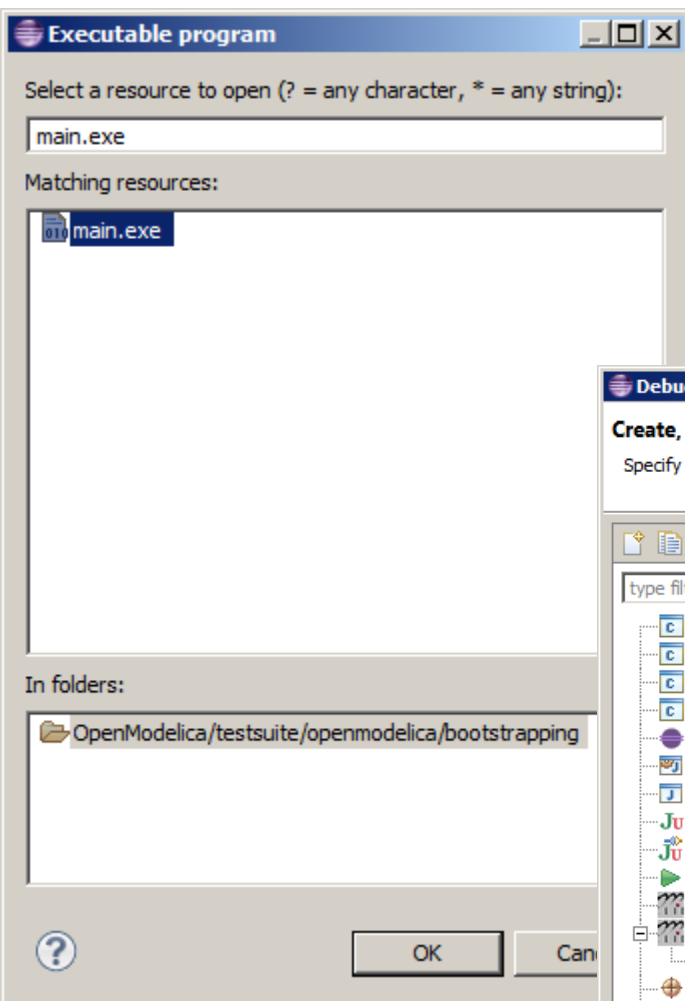
Change name



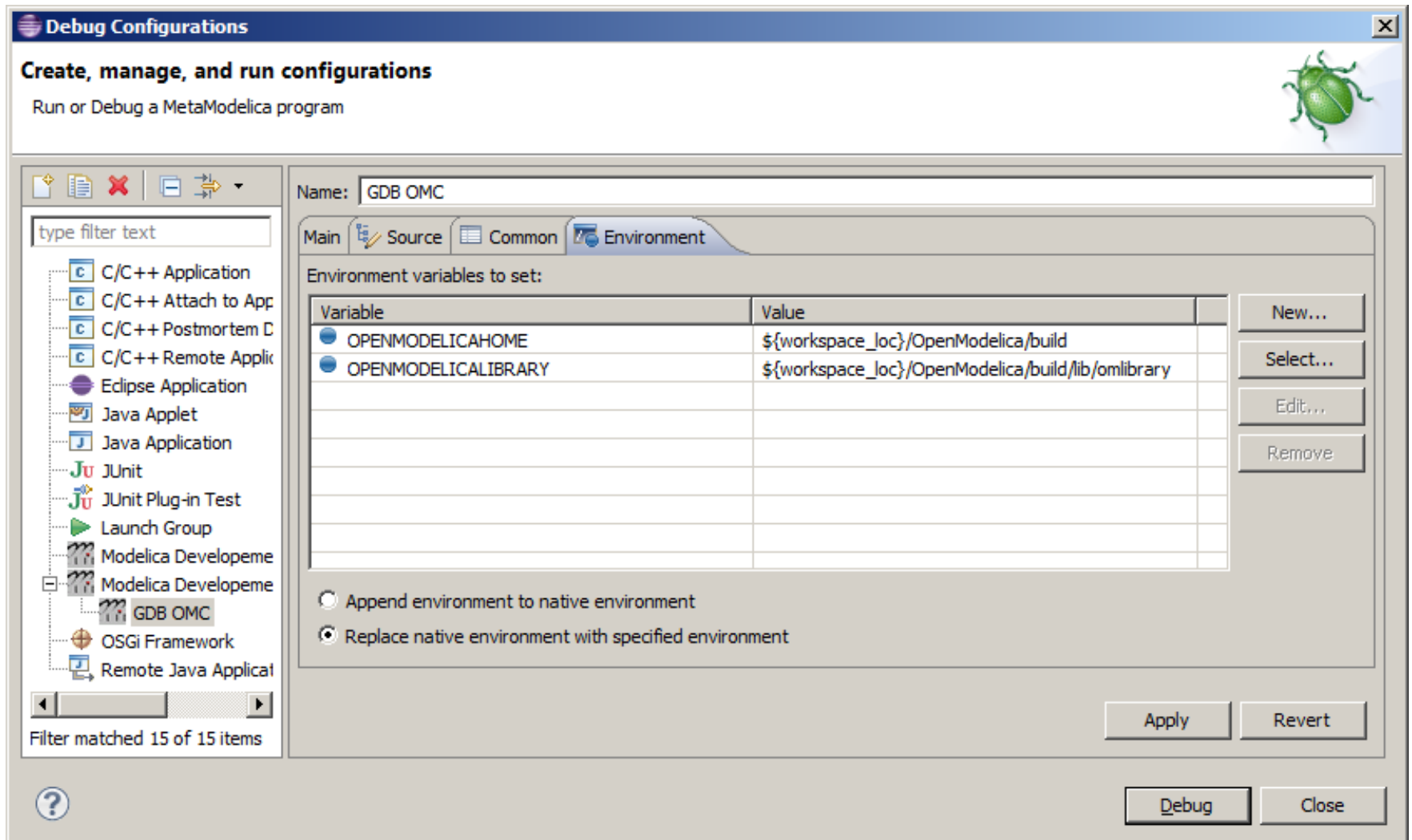
Select program



Select program and work directory

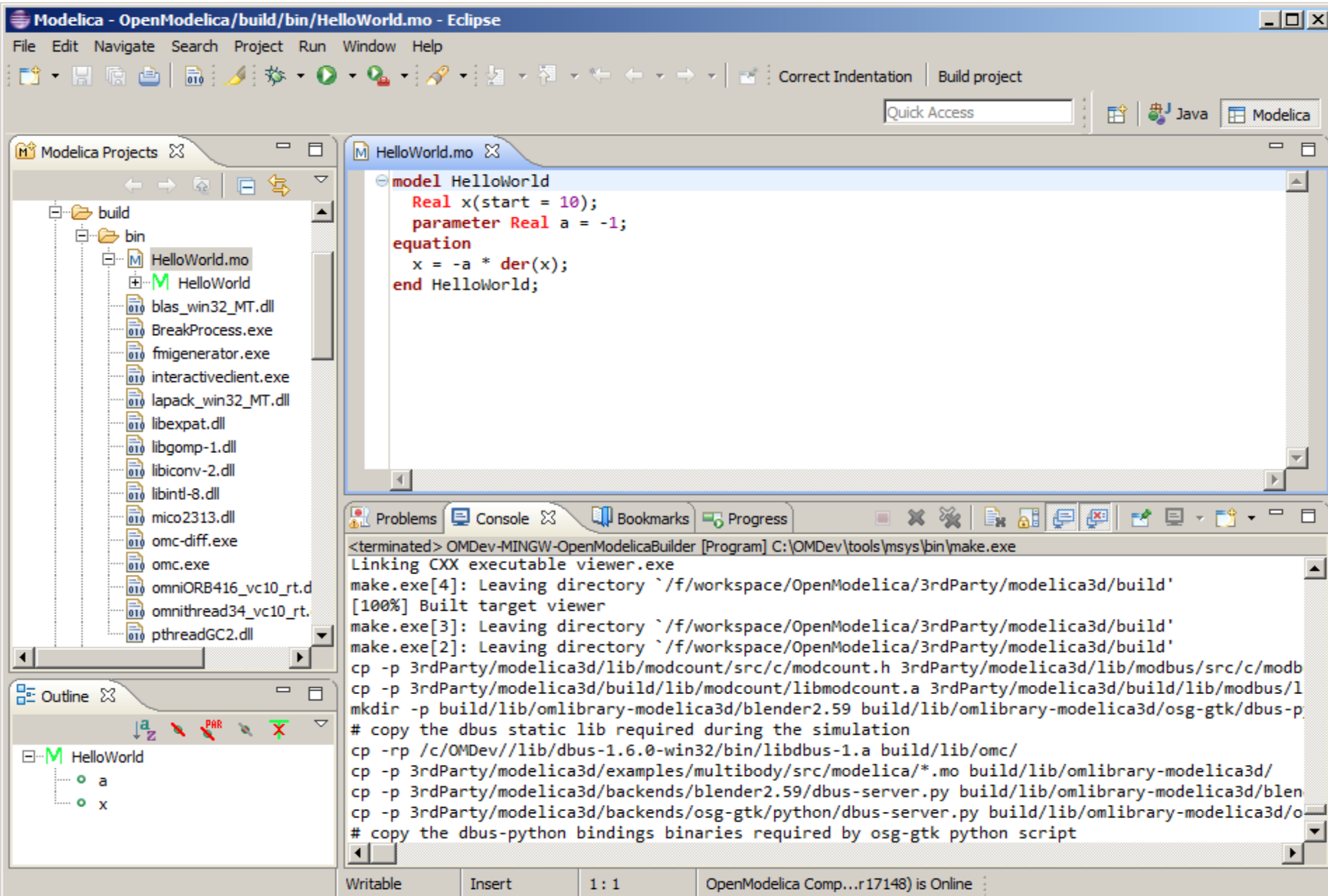


Check environment tab



Add OPENMODELICAHOME and OPENMODELICALIBRARY

Have a test example



Modelica - OpenModelica/build/bin/HelloWorld.mo - Eclipse

File Edit Navigate Search Project Run Window Help

Correct Indentation Build project

Quick Access

Java Modelica

Modelica Projects

build

bin

HelloWorld.mo

HelloWorld

blas_win32_MT.dll

BreakProcess.exe

fmigenerator.exe

interactivedient.exe

lapack_win32_MT.dll

libexpat.dll

libgomp-1.dll

libiconv-2.dll

libintl-8.dll

mico2313.dll

omc-diff.exe

omc.exe

omniORB416_vc10_rt.d

omnithread34_vc10_rt

pthreadGC2.dll

HelloWorld.mo

```
model HelloWorld
  Real x(start = 10);
  parameter Real a = -1;
equation
  x = -a * der(x);
end HelloWorld;
```

Problems Console Bookmarks Progress

<terminated> OMDev-MINGW-OpenModelicaBuilder [Program] C:\OMDev\tools\msys\bin\make.exe

Linking CXX executable viewer.exe

make.exe[4]: Leaving directory `f:/workspace/OpenModelica/3rdParty/modelica3d/build'

[100%] Built target viewer

make.exe[3]: Leaving directory `f:/workspace/OpenModelica/3rdParty/modelica3d/build'

make.exe[2]: Leaving directory `f:/workspace/OpenModelica/3rdParty/modelica3d/build'

cp -p 3rdParty/modelica3d/lib/modcount/src/c/modcount.h 3rdParty/modelica3d/lib/modbus/src/c/modb

cp -p 3rdParty/modelica3d/build/lib/modcount/libmodcount.a 3rdParty/modelica3d/build/lib/modbus/1

mkdir -p build/lib/omlibrary-modelica3d/blender2.59 build/lib/omlibrary-modelica3d/osg-gtk/dbus-p

copy the dbus static lib required during the simulation

cp -rp /c/OMDev//lib/dbus-1.6.0-win32/bin/libdbus-1.a build/lib/omc/

cp -p 3rdParty/modelica3d/examples/multibody/src/modelica/*.mo build/lib/omlibrary-modelica3d/

cp -p 3rdParty/modelica3d/backends/blender2.59/dbus-server.py build/lib/omlibrary-modelica3d/blen

cp -p 3rdParty/modelica3d/backends/osg-gtk/python/dbus-server.py build/lib/omlibrary-modelica3d/o

copy the dbus-python bindings binaries required by osg-gtk python script

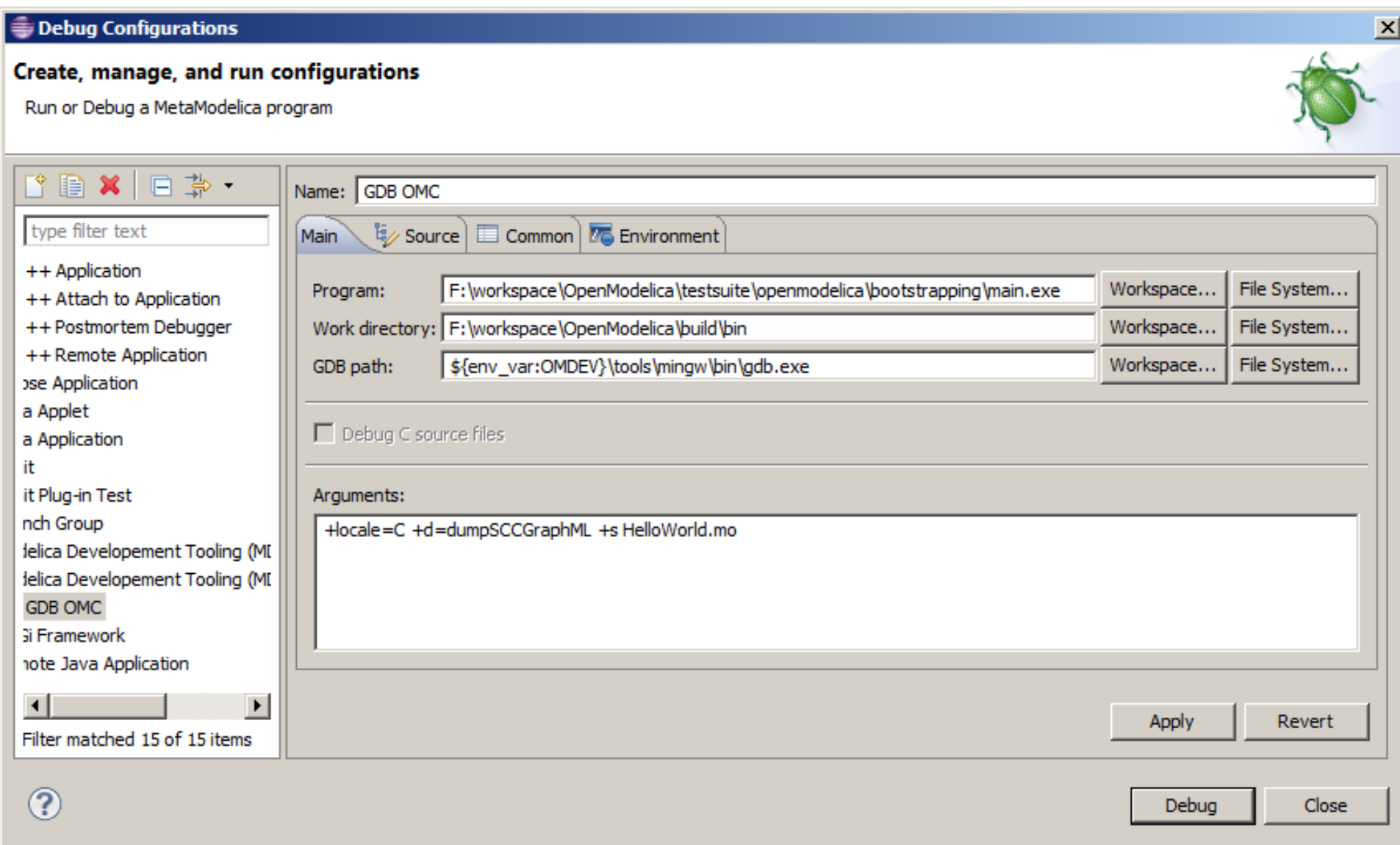
Outline

HelloWorld

- a
- x

Writable Insert 1:1 OpenModelica Comp...r17148) is Online

Add command line parameters



Put a breakpoint

The screenshot shows the Eclipse IDE with the Modelica compiler source code open. The left sidebar displays the 'Modelica Projects' tree, with the 'BackEnd' folder expanded. The main editor window shows the 'BackendDAEUtil.mo' file, which contains the following code:

```
end matchcontinue;
end sortEqnsDAEWork;

function dumpStrongComponents
  "dump the strongly connected components on a flag"
  input BackendDAE.EqSystem isyst;
  input BackendDAE.Shared ishared;
algorithm
  _ := matchcontinue(isyst, ishared)
  case (_, _)
    equation
      false = Flags.isSet(Flags.DUMP_SCC_GRAPHML);
    then ();
  case (_, _)
    equation
      IndexReduction.dumpSystemGraphML(isyst, ishared, NONE(), "Comps" +& intString(systemSi
    then ();
  end matchcontinue;
end dumpStrongComponents;

public function postOptimizeDAE "
```

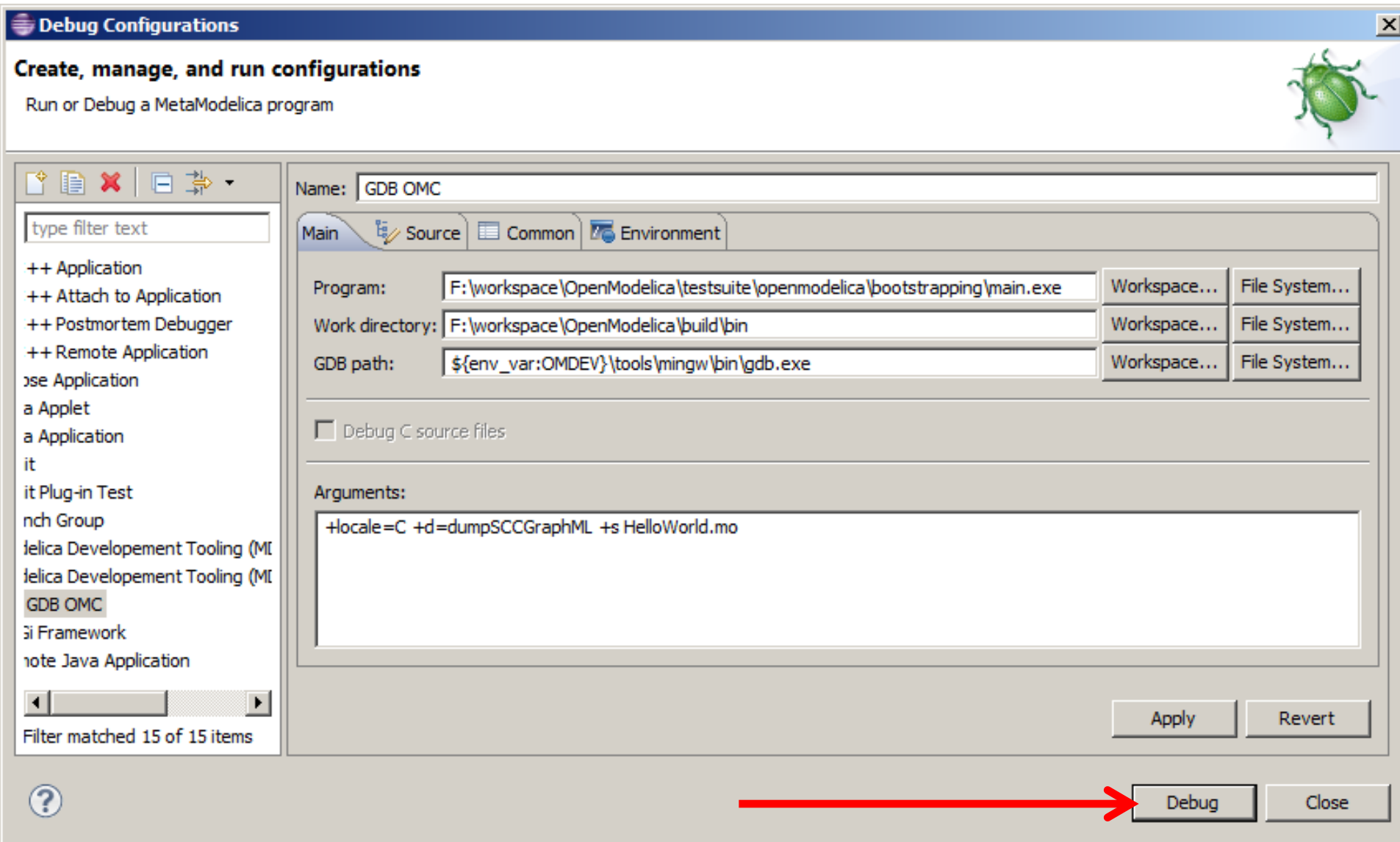
A red arrow points to the left margin of the code editor, indicating where to set a breakpoint. The bottom of the IDE shows the 'Problems' and 'Console' tabs. The console output includes the following text:

```
<terminated> OMDev-MINGW-OpenModelicaBuilder [Program] C:\OMDev\tools\msys\bin\make.exe
Linking CXX executable viewer.exe
make.exe[4]: Leaving directory `~/f/workspace/OpenModelica/3rdParty/modelica3d/build'
[100%] Built target viewer
make.exe[3]: Le
make.exe[2]: Le
cp -p 3rdParty/
cp -p 3rdParty/modelica3d/build/lib/modcount/libmodcount.a 3rdParty/modelica3d/build/lib/modbus/l
mkdir -p build/lib/omlibrary-modelica3d/blender2.59 build/lib/omlibrary-modelica3d/osg-qt/dhus-n
```

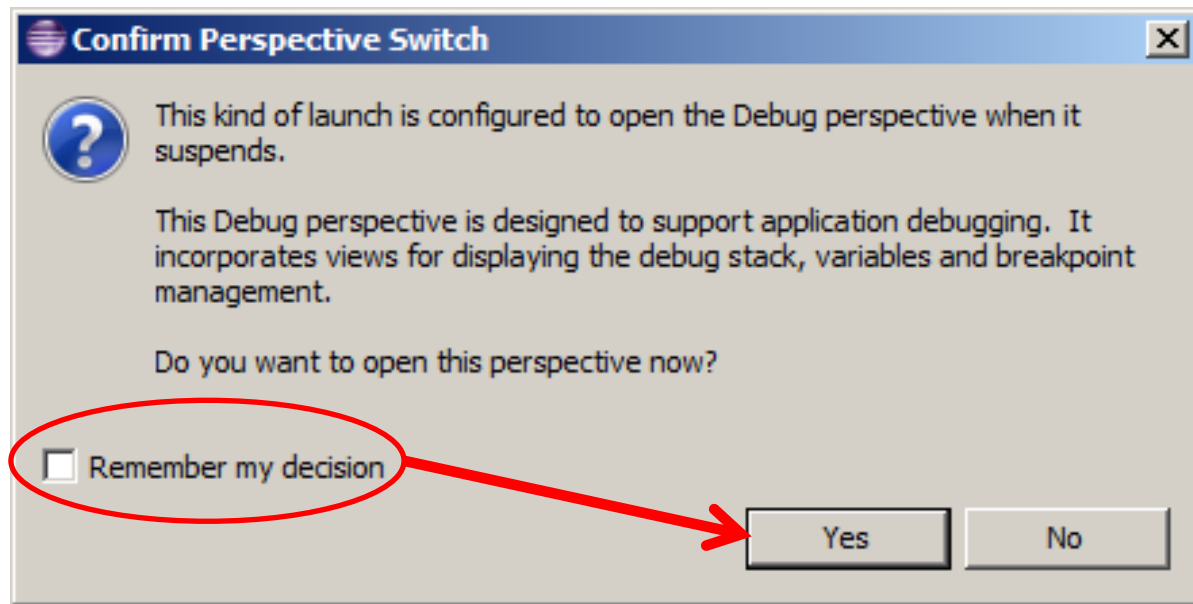
The status bar at the bottom indicates the current line is 8177:43 and that the OpenModelica compiler is online.

Double click here

Start Debug



Switch to Debug perspective



Debug perspective

The screenshot shows the Eclipse IDE in the Debug perspective. The top toolbar includes standard Eclipse icons and a 'Quick Access' search bar. Below the toolbar are tabs for 'Correct Indentation' and 'Build project'. The main interface is divided into several panels:

- Debug Console:** Located on the left, it shows the GDB OMC [Modelica Development Tooling (MDT) GDB] session. The 'Main Thread (stepping)' is selected, and a list of stack frames is displayed, including `BackendDAEUtil_dumpStrongComponents` at `backenddaeutil.mo:8181`. The word **stack** is written in red over this panel.
- Variables:** Located on the right, it shows a table of variables. The word **variables** is written in red over this panel.
- Code Editor:** The central panel shows the source code of `BackendDAEUtil.mo`. The line `IndexReduction.dumpSystemGraphML(isyst, ishared, NONE(), "Comps" +& intString(systemSi` is highlighted in green. The word **execution point** is written in red over this panel.
- Outline:** Located on the right, it shows a tree view of the project structure, including `countDiscreteVars1`, `countDiscreteVars2`, `countDiscreteVars3`, `createEmptyBackendDAE`, `daeSize`, `devectorizeArrayVar`, `dimensionsToRange`, `dumpStrongComponents`, and `eansForVarWithStates`.
- Console:** Located at the bottom, it shows the GDB OMC [Modelica Development Tooling (MDT) GDB] session. The output text includes `F:\workspace\OpenModelica\testsuite\openmodelica\bootstrapping\main.exe`, `class HelloWorld`, `Real x(start = 10.0);`, `parameter Real a = -1.0;`, `equation`, and `x = (-a) * der(x);`. The word **console** is written in red over this panel.

The bottom status bar shows the current file is `Writable`, the cursor is in `Insert` mode, the line number is `8181 : 1`, and the OpenModelica compiler is online.

The End

- The Eclipse workspace created in this demo (only with the important parts) is here:
<https://openmodelica.org/documents/>
- Also this document should be there
- Contact Adrian.Pop@liu.se for any issues.