

Declare Your Language

Eelco Visser

TU Delft

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This book is on `github` at `https://github.com/MetaBorgCube/declare-your-language`

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Preface

This is a book about declarative language definition with the Spoofax Language Workbench.

This is a book in progress as Spoofax itself is very much in progress. Spoofax is the product of an ongoing research project that investigates the nature of software language definition. We are continuously experimenting with better ways to do things. As a result, new features are being added to Spoofax and we are also always working on the guts of the workbench. Therefore, working with Spoofax can be a somewhat rocky experience.

This book and the accompanying Spoofax projects are on [github](#). I will consider pull requests with minor or major contributions to the book and accompanying projects.

– Eelco Visser

June 13, 2015

Chapter 1

Getting Spoofax

In this chapter we discuss how to install Spoofax and setting up language projects.

1.1 Eclipse + Spoofax

Spoofax is an Eclipse plugin. Hence, the regular way to install an Eclipse plugin is to use its update site to add the plugin to an existing Eclipse installation. However, Spoofax requires a few tweaks to be applied to the Eclipse configuration and it requires the separate installation of Java 7 or later. To avoid all this hassle, Spoofax is now also distributed as a complete Eclipse installation with Spoofax pre-installed and all configurations set correctly. The download page

<http://metaborg.org/download>

provides a link to the integrated distributions. Note that this distribution is currently only available for the bleeding edge continuous build version of Spoofax.

Download the `spoofax-<os>-<arch>-jre.zip` for your computer's operating system and architecture, unzip, and launch the Eclipse application inside.

The first thing that Eclipse will ask is which Workspace to use. The Workspace is the default directory where projects are created. Just create a new directory with an appropriate name (e.g. Workspace-Spoofax) in an appropriate location in your file system.

The first thing that I do when installing a new Eclipse is changing its appearance. In the Eclipse menu choose Preferences. In the dialog window go to General > Appearance and choose theme Classic.

Another setting that is useful to adjust is that for refresh. In the search box in the Preference dialog type 'refresh'. Under Startup and Shutdown select Refresh workspace on startup. Under Workspace unselect Build automatically and select Refresh on access.

The default font size is configured to be 11pt, which is too small for my eyes. Adjust the font size in the Preferences > General > Appearance > Colors and Fonts, and there select Basic > Text Font and choose something appropriate. I find 14pt Monaco to work out pretty well.

JRE Error At the first time that I try out the Eclipse with pre-packaged JRE, I get the following error:

```
'Update Installed JREs' has encountered a problem. Resource  
'/.org.eclipse.jdt.core.external.folders' already exists.
```

After ignoring the error, Spoofax appears to work fine. It is not clear at this point whether that is due to the fact that I had already installed JRE8.

1.2 Creating a Project

To start a new language with Spoofax you need to create an Eclipse project.

In the File menu select New > Project In the dialog window select Spoofax editor project and hit the Next > button. This presents the Spoofax Editor Project wizard dialog in which you should indicate the name and file extension of your project and language. This information is used to instantiate all the files that are needed in a Spoofax project.

The wizard will create a project directory in your Workspace with the following properties:

Project name This will be the name of your project and the directory that contains it.

Language name This is the name of your language, which means that it will be used as the basis for several file names.

Plugin ID and package name This is the name of the Java package and plugin that is generated from your project.

File extensions This is the file extension that the program files in your language will have

Generate .gitignore file Of course you will maintain your project's version history in git. Check the box

Generate minimal project only Check this box to start with a fresh language. In this book I will walk you through building the various elements that you need for your language.

Choosing the name for your language is important. Unfortunately, the name that you choose will be hardwired at many places in your project. Therefore, **renaming** your project and language afterwards is **virtually impossible**. The usual way to achieve a renaming is to create a new project with the right name and manually copy over the files from your old project.

1.3 Importing an Existing Project

Another way to use Spoofox is to import an existing project. The [github repository](#) for this book provides a series of example projects which are the basis for the text in the book. To use those projects check out the git repository and import the projects into Eclipse as follows. In the File menu select Import In the import dialog select General > Existing Project into Workspace. Browse to the

declare-your-language/languages directory and select a project to import (or select the entire directory, which will allow you to import all projects at once). In the Projects: are select all projects that you want to import. Hit the Finish button.

Importing a project will add it to your workspace without copying it to the Workspace directory.

You can remove a project from your workspace using Edit > Delete. This will not remove the files from the file system, unless you select that option using the check box.