

# Eclipse Plug-ins and Extension Points

Welcome to this tutorial! We will walk you through the process of starting Eclipse for the first time, importing existing plug-ins, and creating a simple plugin yourself.

## Preliminaries

There's a few things to do before we dive into the tutorial itself. For example, to do Eclipse programming, you will have to get your hands on an Eclipse installation first. Read through the following sections to get ready for the tutorial tasks.

## Required Software

Install [Eclipse](#). For what we do, we recommend installing the Eclipse Modeling Tools.

## Finding Documentation

During the tutorial, we will cover each topic only briefly, so it is always a good idea to find more information [online](#). Here's some more resources that may prove helpful:

- [Java™ Platform, Standard Edition 8 API Specification](#)  
As Java programmers, you will already know this one, but it's so important and helpful that it's worth repeating. The API documentation contains just about everything you need to know about the API provided by Java.
- [Eclipse Help System](#)  
Eclipse comes with its own help system that contains a wealth of information. You will be spending most of your time in the *Platform Plug-in Developer Guide*, which contains the following three important sections:
  - [Programmer's Guide](#)  
When you encounter a new topic, such as SWT or JFace, the Programmer's Guide often contains helpful articles to give you a first overview. Recommended reading.
  - [References -> API Reference](#)  
One of the two most important parts of the Eclipse Help System, the API Reference contains the Javadoc documentation of all Eclipse framework classes. Extremely helpful.
  - [References -> Extension Points Reference](#)  
The other of the two most important parts of the Eclipse Help System, the Extension Point Reference lists all extension points of the Eclipse framework along with information about what they are and how to use them. Also extremely helpful.
- [Eclipsepedia](#)  
The official Eclipse Wiki. Contains a wealth of information on Eclipse programming.
- [Eclipse Resources](#)  
Provides forums, tutorials, articles, presentations, etc. on Eclipse and Eclipse-related topics.
- [Eclipse Layout Kernel](#) 🙌 ⚠️  
Documentation on how the layout infrastructure works and on how to write your own layout algorithms. This is our project, so if you find that something is unclear or missing, tell us about it!

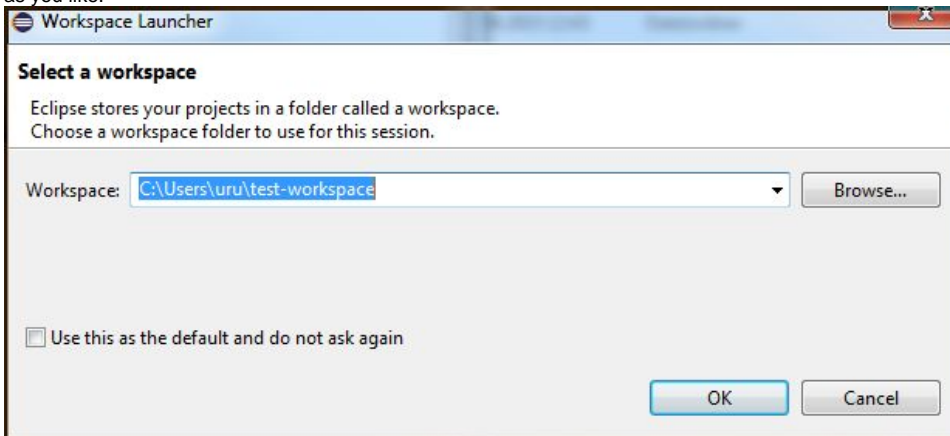
You will find that despite of all of these resources Eclipse is still not as well commented and documented as we'd like it to be. Finding out how stuff works in the world of Eclipse can thus sometimes be a challenge. However, you are not alone: this also applies to many people who are conveniently connected by something called *The Internet*. It should go without saying that if all else fails, [Google](#) often turns up great tutorials or solutions to problems you may run into. And if it doesn't, your advisers will be happy to help.

As far as KIELER documentation is concerned, you will find documentation at the [KIELER Confluence](#). The documentation is not as complete as we (and especially everyone else) would like it to be, however, so feel free to ask those responsible for help if you have questions that the documentation fails to answer.

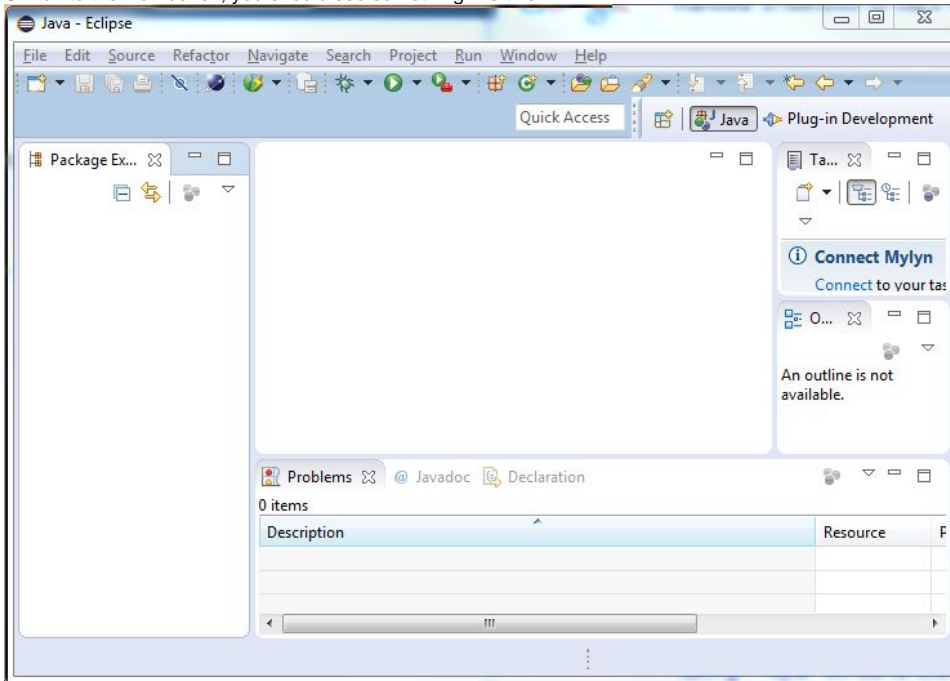
## First Steps with Eclipse

### Starting Eclipse

1. Eclipse uses workspaces to store, for instance, user preferences. Upon the first start of Eclipse you will be asked to specify a location. Select one as you like.



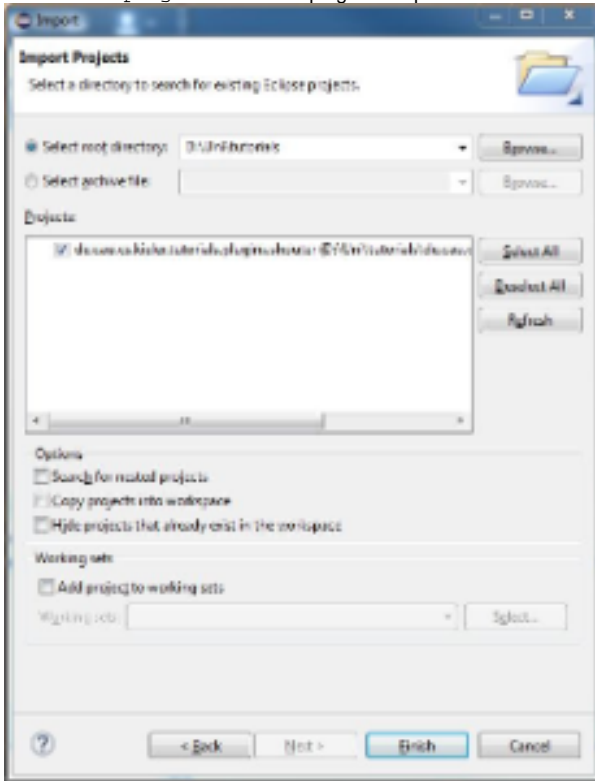
2. Switch to the workbench, you should see something like this



## Importing Existing Plug-ins

1. [Download](#) the zip file with an example plug-in from our Stash. Unzip the file.
2. Open the context menu within the *Package-Explorer* (on the very left, right-click the empty space).
3. Select *Import*. Then chose *General > Existing Projects into Workspace*.

4. Browse to the location where you unzipped the downloaded plug-in. Click open. Check the checkbox in front of the `de.cau.cs.kieler.tutorials.plugins.shouter` plug-in and press *Finish*.



## Running Eclipse

In Eclipse, we develop plug-ins that extend the basic functionality of Eclipse itself. As we do not always want to run Eclipse with all the functionality there is, we can use *Run Configurations* to precisely specify the functionality we want.

1. Click *Run > Run Configurations...*
2. Right-click *Eclipse Application* and click *New*. Set the configuration's name to *Eclipse Test*.
3. On the *Plug-ins* tab, set *Launch with* to *plug-ins selected below only*.
  - a. Click *Deselect All*.
  - b. Check the *Workspace* item in the tree.
  - c. Check the `org.eclipse.ui.ide.application` plugins under *Target Platform*.
  - d. Click *Add Required Plug-ins*. Press it twice (just to be sure!).
4. Click *Apply* to save your changes and then *Run* to start an Eclipse instance to test with.
5. In the newly started Eclipse, open the context menu of the Project Explorer.
6. You should see a *Hello Shouter* entry which shouts out *Hello* if you press it.

Note that you can run your configuration also by using the debug button in the main menu. In that case you will be able to use debug features and code changes will be directly active in your Eclipse instance after saving. In the rather rare cases where this is impossible you will be notified.

## Creating Your First Plug-in

1. Open the context menu within the *Package-Explorer* (on the very left, right-click the empty space).
2. *New -> Project...*
3. In the project wizard, choose *Plug-in Project* and click *Next*.
4. As the project name, enter `de.cau.cs.kieler.tutorials.myshouter`. Click *Next*.
5. As the name, enter *Simple Shouter*. Uncheck all checkboxes. Click *Finish*. (Eclipse might ask you whether you want to switch to the *Plug-in Development Perspective*, which configures Eclipse to provide the views that are important for plug-in development. Choose *Yes*. Or *No*. It won't have a big influence on your future...)
6. Eclipse has now created your new plug-in and was nice enough to open the *Plug-in Manifest Editor*, which allows you to graphically edit two important files of your plugin: `plugin.xml` (which has not been created yet) and `META-INF/MANIFEST.MF`. Basically, those two files provide information that tell Eclipse what other plug-ins your plug-in needs and how it works together with other plug-ins by providing extensions and extension points. Our new plug-in will depend on the previously imported plug-in, so switch to the *Dependencies* tab of the editor and add a dependency to `de.cau.cs.kieler.tutorials.plugins.shouter`. Save the editor and close it. (You can always reopen it by opening one of the two mentioned files from the *Package Explorer*.)

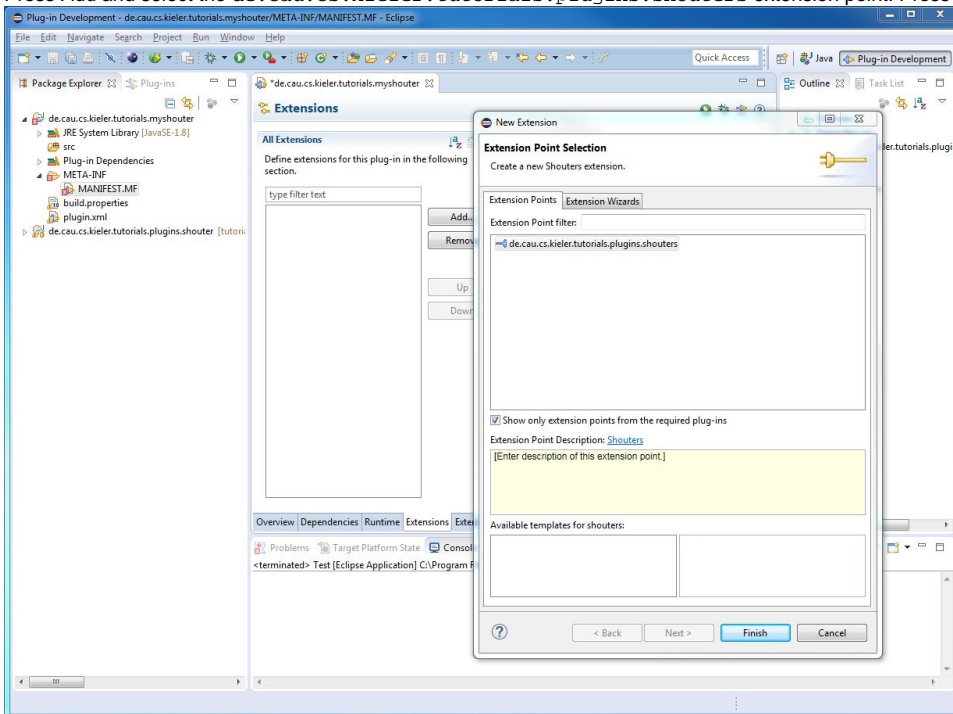
## Extending Functionality

We will now use the extension point mechanism of Eclipse to add some behavior to the `de.cau.cs.kieler.tutorials.plugins.shouter` plugin. An *extension point* is basically a well-defined point where other plug-ins can register to add functionality. The extension point is basically defined by an XML Schema file that defines an interface; other plug-ins may access this interface using XML code in their `plugin.xml` file, so-called *extensions*.

The `de.cau.cs.kieler.tutorials.plugins.shouter` plug-in defines such an extension point to register *Shouters*. A shouter is a Java class that implements the following interface.

```
public interface IShouter {  
    String getShoutString();  
}
```

1. In your previously created plugin (`de.cau.cs.kieler.tutorials.myshouter`) create a new class `MyShouter` that implements the `IShouter` interface.
  - a. From the Package Explorer context menu select **New > Class**.
2. Open the `MANIFEST.MF` of your plugin and navigate to the *Extensions* tab.
3. Press **Add** and select the `de.cau.cs.kieler.tutorials.plugins.shouters` extension point. Press **Finish**.



4. Give it a name and using the *Browse* button select your previously created class implementing the `IShouter` interface.
5. Start your Eclipse instance again using the created run configuration and test your very own shouter.